ETEN 17
The Proceedings of the 17th Annual Conference of the European Teacher Education Network

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Neil Hall
University of Greenwich
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The seventeenth annual ETEN Conference was hosted by the Escola Superior de Educação, Instituto de Politécnico do Porto, Portugal in April 2007, and as usual was organised around Thematic Interest Groups that everyone refers to as TIGs. ETEN was established in 1989 and currently has more than 50 member institutions largely from Europe with some members from North America, all involved in teacher education and social educator training. It is through the TIGs that possibilities for co-operative initiatives in professional development, advanced professional practices and research are explored. Each TIG has a leader, and develops its own guidelines, vision statement, membership criteria, organisational structure, planned activities and anticipated outcomes. The ETEN Conference at Porto was organised around thirteen Thematic Interest Groups:

1. Arts education
2. Biological sciences
3. Democracy
4. Early learners and ICT
5. Instructional technology and learning
6. Internationalisation
7. Mathematics education
8. Myths and fairy tales
9. Physical education
10. Reflective practice
11. Special educational needs
12. Technology teaching and learning
13. Urban education

The conference is an important venue allowing the Thematic Interest Groups to share professional experiences through the presentation of papers and discussion, and encourages collaboration with opportunities for student and staff exchanges, the promotion of educational projects, and collaborative research. These Conference Proceedings provide an imperfect record of what was discussed in each TIG. Some papers reflected recent professional practices, some reported on research projects, and others focused on the development of future collaborations and funding possibilities. The Proceedings are unlikely to reflect either the full level of enthusiasm or the intellectual and professional engagement of around 200 teacher and social educators discussing a range of practical, policy and political issues impacting on education. The Proceedings present all the papers and reports presented at an individual TIG, provided the paper was then passed on to the editors, and followed the ETEN publications guidelines. The editors retain control over all aspects of editing a paper, and this is acknowledged when a paper is passed on to a TIG leader. Papers in the Proceedings are organised alphabetically, first by TIG title then by the first author’s family name.

ETEN’s Conference Proceedings became a regular feature of the organisation from the 2001 conference held at the University of Greenwich. Following a refereeing process the best conference papers have been returned to their authors for editing and improvement, then to be published in JETEN, the Journal of the European Teacher Education Network.

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Contents

Arts education
Interdisciplinary process in arts teaching 9
Kirsti Ese, Maybritt Jensen and Ann-Hege Lorvik Waterhouse

Playing through drama and art 14
Maybritt Jensen and Michael Jarvis

Development of movement notation language among fourth grade children 21
Shlomit Ofer and Billie Eilam

Including middle school art teachers on interdisciplinary teams: A case study 28
Paula J. Stewart and Susan Davis

Democracy
Overview 34
Sidsel Hadler-Olsen

Research on new elective program subjects for lower secondary school students 35
Inga H. Andreassen and Britt Unni Wilhelmsen

John Dewey and multicultural education in a global society: Moral and ethical principles that guide pedagogical practice in peace education 39
Thomas J. Fiala

Early learners
The Early Years Network: A case study in continuing professional development 45
Rory McDowall Clark and Karen Hanson

The role of traditional/online educational games on the language teaching-learning process: a cognitive-constructive psycholinguistic perspective 50
Manuela da Silva Correia

Children learn by means of the scientific thinking circle 56
Kristof Van De Keere, Nele M.A. Mestdagh & Peter J. N. De Jonckheere

Instructional Technology and Learning
Computing skills among educators 62
Kari Kumpulainen

Digital media production: learning potential in teacher education 69
Marie Leijon and Elisabeth Söderquist

New on-line teaching qualification for college lecturers: An evaluation 72
Carey Normand and Brenda Keatch
The purpose of focus groups in ascertaining learner satisfaction with a virtual learning environment
Yana I Tainsh

Mathematics Education
If it ain’t broke, don’t fix it: The development of mathematics Education in England over the past 100 years
Melvyn Brown

Mental arithmetic as a strategy of thought and mathematical communication
Dárida Maria Fernandes

Brain functioning: Simultaneous and successive processing
Neil Hall

Some reflections on a major change on teacher formation in Portugal
Pedro Palhares

Empowering mathematics educators with instructional improvement seminars
Robin Rufatto

Preservice primary teachers and mathematics: A longitudinal study
Isabel Vale, Lina Fonseca, Domingos Belo, Teresa Gonçalves and Teresa Pimentel

Myths and Fairytales
Heroines in North American folklore
Anne Drolett Creany

Physical Education
Land of opportunities
Karen Marie Eid Kaarby and Heidi Osnes

Bullying in primary school: Toys and play at recess time can help in reducing bullying
Beatriz Oliveira Pereira

Reflective Practice
ETEN as a faculty learning community: An exploratory study
Michael P. Brown and Michelle Glowacki-Dudka

A coaching approach to supporting reflective practice
Shaun Hughes

Deepening reflective practice: Considering our teaching and our lives in the “Swampy lowlands”
Dixie K. Keyes
Special Educational Needs
Pre-service teachers and their perceptions of the inclusive classroom
Daniel Paul Gray, Michele Conway, Joann Migyanka and Sondra Lettrich

Presumptions of the recalling processes activation in special needs pupils education
Adolfas Juodraitis

Using music activities to improve the attention span and language ability of three young autistic children
Ling-Yu Liza Lee

Priorities of pedagogical psychological services’ activities in Lithuania
Odeta Sapelyte, Algirdas Alisauskas and Jonas Ruskus

“Basic functions therapies” have not died!
Pieter Van Biervliet

Urban Education
The case against multi-cultural education
George R. Bieger, Alphonse N. Novels, Larry A. Vold, and Yong Yu

God or no God?
George Foldesy and David Holman

The why’s and how’s of teaching about religion
James E. Gibson

Liminality and the cohort experience: Exploring the transformative education of pre-service teachers
James Gibson and Jennifer V. Rotigel

Students’ views of language use at two different science programs
Gun Hägerfelth

Interdisciplinary understanding of Gothenburg
Ulrika Holmgren and Bengt O Tedeborg

What’s wrong with minorities? An analytical critique of contemporary usages
M. Francyne Huckaby

Performance-based mathematics tasks: A meaningful curriculum for urban learners
Christine D. Thomas, Desha L. Williams and Kimberly Gardner
ARTS
EDUCATION
Interdisciplinary process in arts teaching
Kirsti Ese, Maybritt Jensen and Ann-Hege Lorvik Waterhouse
Oslo University College.

In writing this paper we raise some basic questions regarding teaching art subjects as well as documentation forms in the art subjects. How can we write about a presentation (in this case a performance) which we already have done? And is it possible to present a philosophy of teaching through showing a performance? In this paper we have decided to reflect upon our production and the process we have been through so far. As a basic outset for our presentation and teaching philosophy we also present some reflections on children’s way of using symbols in playing. In order to see this in the right context we additionally find it important to present some of the main perspectives of art subjects in the “Framework plan for the Content and Tasks of Kindergartens” and the main lines of content in the course “Spillerom”.

Our performance and reflections after the presentation in Porto
Preparing the presentation, it became clear to us quite early that we wanted to make a performance. We thought it would be the best way of showing how we work with our students in the course “Spillerom”. We are three teachers who teach arts, drama and music, and we had never done ourselves what we always ask our students to do; go into a process making an art production meant for children. The trigger was a simple Norwegian lullaby. We made associations from the colour white, something ethereal and children’s play. Three figures should be present in an installation. While leaving the thought of using the lullaby, we investigated how to form our installation and where to place the audience.

A circle on the floor is made of coloured transparent glass beads, black birch branches without leaves, white feathers and small white plaster masks of doll faces. A tall, white mosquito-net is hanging from the roof as a contrast to the circle.

There are three figures; the tall, withdrawn inside the net, the white and shy, but playful and curious light haired and the calm, sensible and brave grey figure.

When the performance starts, the tall figure stands still inside the net. The two other figures stand outside on either side of the circle. Music is played and the white figure enters the circle curiously taking in the audience and starts investigating the things she finds lying on the floor. After a while the grey enters and starts investigating the things, too¹. She has a small suitcase where she collects the things she finds. After a while the two figures become aware of each other and start playing with a white feather. The figure in the middle turns slowly, sees them, but can not communicate with them. At the moment when the grey and the white look through a coloured transparent glass bead, they get aware of the figure in the middle – touch it and make it move. They push the suitcase under the net to the tall figure. She opens up the suitcase and starts investigating the feather, the branch and the beads. The grey and the white leave the tall turning to the audience in order to give away some of the glass beads as small tokens. At the end they sit down returning to their investigation. The performance ends.

An installation is always influenced by the room it’s created in. In Oslo we performed in a squared and rather naked drama room. That room is neutral, with a grey coloured floor that made the feathers, the masks, the beads and the branches very visible. The expression was very pure. In Porto there was a quite different room with a dark, patterned carpet on the floor. It gave a different expression to our installation.

Our installation is forming a circle. We placed the audience around it sitting on the floor. This challanged our dialogue with the audience and we questioned our movements constantly during the process. The circle and the mosquito-net in the midle prevented the audience from seeing every movement the figures were doing. However, the circle made the audience see each other sharing the experience.

We chose to use music made by the Norwegian musician Nils Petter Molvær, from his album NP3. The music is quite minimalistic in its expression. The changes in the music develops very slowly, but there are some peaks that underline some of the small changes in the performance; when the shy character picks up a feather, when the two characters in the circle become aware of each other, and when they become aware of the figure in the middle.

¹ Nils Petter Molvær. NP3
The music may be described as chilled, white, distant, but with warmth. The main instrument is the trumpet. In the first 5-6 minutes the trumpet is accompanied by a guitar. The main change in the music develops through a change of theme and instrumentation; the trumpet is now melting together with keyboard, bass, guitar and drums. This is where the grey and the white become aware of the figure in the middle.

The figures grew to life during the creative process. We had some ideas of how they were before we started playing, but during our process they got life and their personality became clearer to us. Our performance is quite open in its expression. And that is what we consider to be one of the most important aspects of making art for children – it should be open so that the audience can take an active part.

With an open expression the audience becomes part of the creative process. We showed our performance once before coming to Porto and then once in Porto. The feedback changed with the audience, as a result of the open expression that we emphasize in our performance. What you see depends on who you are.

**Children’s playing and performance art**

In the following we would like to make some reflections on children’s play and try to line out some significant elements in our teaching and working with creative processes.

In the research of Dr. Art Faith Guss she investigates how children in their role-play give dramatic, symbolic and aesthetic form to thoughts, ideas and feelings. The children shifting between fiction and non-fiction or reality are through their play intuitively using a variety of means from different art forms. Children are investigating and playing with form and meaning. “While playing they explore, interpret and express ad hoc what lies in their imaginations and what arises during their performance”.

Our teaching at “Spillerom” is based on the perspective of the child through playing develops identity and gains knowledge on numerous areas. In this context teaching aesthetic subjects means to work with the students to develop their ability to be creative and to relate to the creative processes in children’s playing.

At the course “Spillerom” the students are making artistic productions or performances. Guss compares elements from performance art with children’s playing, witch further can be related to the way our students are working in their creative processes.

Guss refers to that people working with performance art often have backgrounds from different art forms. In that way you can look upon performance as a multi art expression. In performance art you work with the significance of the different art forms in order to work out a holistic expression. In our case both the installation, the music and the figures were investigated and developed alongside and from each other. We didn’t start out with a written manuscript or text, but rather ideas, images and moods which also characterize a performance.

Guss refers to the process of working with a performance by pointing out that it is “explorative of both form and meaning”\(^2\). In that sense there is no given interpretation of the expression, rather an involvement and dialogue with the audience towards different investigated perspectives as mentioned before. This perspective on working with art and creative processes is significant to our teaching philosophy which we will return to below.

**Some perspectives on children’s culture in the Norwegian Framework Plan for the Content and Tasks of Kindergartens**

In 2006 we got a new curriculum for Norwegian Kindergarten. The curriculum is compulsory for every kindergarten in Norway and defines the kindergarten as a cultural arena. “Culture is here taken to mean art, and aesthetics, as well as common patterns of behaviour, knowledge, values, attitudes, experiences and nodes of expression. Culture is about heritage and traditions, about creating an about bringing to life, renewing and making relevant. Culture arises out of the tension between the tradition and a renewal. Both


\(^3\) op. cit.
local and national cultural values, in so far as they are reflected in the environments in which children grow up, must be represented in the activities of kindergartens.\(^4\)

The chapter on arts subject is called “Art, culture and creativity”\(^5\). Art and culture is integrated into what we can define as children’s culture. It’s an important part of how children play and learn. Impressions from art and cultural activities in the society must also be a part of the daily activity in the kindergarten.

The Danish professor Beth Junker points out that in Scandinavia the pedagogical perspective has been to bring the child into the culture, into the tradition and into the heritage with intention to teach children about art. Today this perspective on children and children’s culture has changed. The child must be defined as a cultural creative individual. Junker compares this with the way the society changed the thinking about women and the fight for equality of status\(^6\).

The Norwegian framework plan has a wide definition of children’s culture. “Child culture is to be taken as culture of, with and for children. Children participate in culture and create their own culture. Children recreate and renew culture through interaction with one another, with adults and with the culture they encounter in other people and situations. Children interpret their impressions and create meaning by playing and realising the things that concern them”\(^7\).

Children must have the opportunity to express themselves through a number of art based activities and meet art through visiting institutions, museums, groups and peoples who work with art.

In the kindergarten there is a lot of informal art and cultural learning through books for children, pictures, posters, excursions and happenings. During these activities the children have experiences, acquire knowledge and learn about values and attitudes. It’s very important that the preschool teachers are conscious about quality in every activity the children are part of daily in the kindergarten.

**Interdisciplinary teaching at the course “Spillerom – communicate, experience and create interdisciplinary art with children”**

The course “Spillerom” is an optional specialisation at the end of the Preschool Teacher Education (3\(^{rd}\) year) at Oslo University College. It is an interdisciplinary study which consists of the 4 subjects Arts, Drama, Music and Poetry and Text. The course which is equivalent to 30 ECTS credit-points is available to a class of 22 students during the autumn term.

Oslo University College is located in Oslo - the capital of Norway. Being situated in Oslo gives us the opportunity to visit some of the most important art and cultural centres in Norway. Oslo is a multicultural city. Reflecting its cultural diversity is an important perspective in the curriculum of the teacher education at the collage.

The philosophy of the course is that the kindergarten and the primary school should function as a cultural workshop where children and adults can investigate and create aesthetic expressions together.

One of our main questions in the course is how to create meaningful dialogues between art (forms) and children. The student’s continuously investigate this through working with groups of children which are invited to be part of several creative processes and performances.

During the course the students have several practical projects where they facilitate creative processes with the children in a kindergarten. Each child explores and interprets it’s own experiences and feelings.

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4 The Norwegian Framework Plan of the Content and Tasks of Kindergartens (2006): 19

5 In the chapter “Art, culture and creativity” al the art subjects are described. There are process goals for the children and guidelines for the staff. It also gives examples of art expressions and activity’s the children must be a part of.

6 Beth Juncker (2005), ”Is art for children” Article in ”Child and art”, Tina Østberg (red): 17

7 The Norwegian Framework Plan of the Content and Tasks of Kindergartens (2006): 23
through aesthetic expressions. The children experiment with a wide range of aesthetic expressions through creative processes with dramatical, musical, visual and verbal elements.

Through the course the students work with and reflect upon arts, performances, events and creative processes both for and with children aged 0-10. The students learn about their own creativity by working through creative processes and performance productions. This knowledge provides important insight into how children's creativity and aesthetic behaviour are expressed and visualized through play.

The course is organized in five main themes:

- Creative processes with children
- Arts, performances and events both for and with children
- Interdisciplinary teaching and learning processes
- The learning environment
- Applied aesthetic theory

The course starts with 6 weeks of teaching the aesthetic subjects, extension of previous courses – developing towards interdisciplinary projects in that period. The students create several forms of installations, sculptures, develop characters, clowning, humanettes, creative composition, choir, rhythmical training, dance, several forms of texts and poetry. They also visit museums, exhibitions, theatres, concerts and other events of art performances and happenings during the course.

After the first period the teaching primarily consists of counselling and instruction with different student groups. The size and members of the groups are changed throughout the period. They create several small interdisciplinary performances for and with children. During this period the class makes a study-tour to Barcelona - impressions from this tour make the basis for the final exam. The students work with different partners during the course. Every student has a mid-evaluation-talk with the teachers. A small core team of teachers has been in charge of “Spillerom” during its six years existence.

The exams at the course are practical and theoretical. The student’s have to write a paper based upon reflection on the student’s art processes with children in kindergarten. They also have to write a personal log during the whole course about their own learning process. In various groups they have to create 2 major art productions with children as audience. At the end of the course the students have one practical and one oral final exam in groups of 6 to 8 students. They create and perform an interdisciplinary performance. This performance is shown for a group of children on the day of examination.

During our time teaching at the course there are several issues we have been discussing with our colleges and the students.

- Interdisciplinary challenges in the teaching
- Establish an interdisciplinary framework and perception.
- Identify what the different subjects have in common.
- Explore to what extent it's possible for the different subjects to contribute to interdisciplinary projects.
- Develop pedagogical methods in cooperation with the students by defining and redefining our understanding of interdisciplinary expressions and creative processes.
- Research the challenges of communicating and experiencing different art forms with children.

During this discussions we have develop a method that can be defined as a teaching-philosophy

Our philosophy of teaching

Interdisciplinary learning is to understand the subject’s common relationship. In our subjects this can be common theory, conceptions, philosophical ideas, methods, and expressions that include several subjects. Interdisciplinary art processes require insight in common phenomena, elements and questions of the subjects. Through the different perspectives the student might develop a more holistic understanding of the phenomena.

Some of the main goals of the course are focused on the students’ ability to develop their own personal sensitivity, engagement and reflection through aesthetic activities. In this way the students might experience a personal development meeting various forms of art. The students also have to develop their ability to express themselves through materials, techniques and different forms of aesthetic expressions.
Through their meetings with art and creative processes the students have the opportunity to gain important self insight and to see the world in an aesthetic perspective. Furthermore we think that this knowledge is similar to the way children acknowledge themselves through play.

One of our main perspectives is that through our teaching the students are experiencing the same learning processes about themselves and the art subjects as they want to facilitate while working with children in the kindergarten.

We have experienced that abstract art inspires the students to create aesthetic expressions of a high quality. We think the reason is that abstract art is about form and aesthetic effects that resembles to children’s aesthetic expressions. The students acknowledge that their experiences and interpretations of art expressions have a value. However abstract art also provokes the students and makes them discuss what art can or cannot be. (The discussions are expectations about their own contributions in each of the subject’s children’s aesthetics expressions.) We want to educate preschool teachers to be open-minded about art and how they can use art to inspire children in their creative processes.

The students have different knowledge and preferences concerning each subjects, and they have varying expectations about their own contribution, however they have an attitude that encourages their playfulness. The students are open-minded and curious. It also seems that they are curious of each other and how they can cooperate. Cooperation is very important during the course. We emphasize the learning environment and focus in our teaching, the importance of the different expressions of each student, and their development through interaction with each other and the arts.

This process of making a performance has been a challenge to us and it raised discussion and questions. We believe that going through similar creative processes, the students will have experiences and knowledge that make them more aware and sensible to the children’s own creative processes – something that enables them to meet the child on its own premises.

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Guss, Gabrielle Faith (2004): Dramaturgy in theatre and in children’s dramatic playing, Glitterbird-seminar 2004 in Oslo
Playing through drama and art

Maybritt Jensen and Michael Jarvis
Oslo University College, Oslo; and Nortumbria University, Newcastle upon Tyne, England

Introduction

Our collaboration started in Autumn 2005. We wanted to investigate some mutual aspects of art processes with students and children. We have had the opportunity to work with 1) an international class of students in Oslo, and 2) a nursery class of children aged 3-5, also in Oslo. We wanted to compare the ways in which the different groups worked with us (and us with them) over the course of two small workshops. We want to emphasise that the workshops mark a beginning of a process for us as teachers and that our intention is to work with students and nursery age children in England over the next year.

For each workshop we set up a scenario from the ideas we had about what we wanted for our mutual investigation with the students and the children. The scenario we used with the students was based on a piece of music from which they were free to associate. With the children we used cat animals as a theme for the scenario because we learned that this fitted into an existing topic of interest for the children. In both cases we let the participants work out their associations through movements, narratives, characters, space and colours along with different use of techniques and use of space. In the case of the children the scenario was partly based on interaction between us and the children’s spontaneous aesthetic practice in playing.

For both of us, one a Drama and the other an Art practitioner, it is important to make connections between artforms because they are mutually stimulating and also because they can inform the ways in which we and our student teachers can work with young children. For example, there are strong links to be made between artmaking and pedagogical approaches in terms of a need for an ‘enhanced’ sensory engagement.

Arnold Berleant discusses how contemporary art practice has extended the range of traditional aesthetic senses and object so that there is a greater potential for engaging the whole sensory capacities than ever before. ‘The appeal to our tactile and kinaesthetic sensibilities represent a major shift in expanding the limits of aesthetic perception beyond the traditional aesthetic senses of sight and hearing.’ (Berleant 1991: 38) Further, that what was previously a passive contemplation of art is evolving into ever more active participation and performance. This has important implications for pedagogy as well as art practice. A development towards thinking and responses beyond the immediate visual or aural potential, an extension towards more tactile and kinaesthetic modes of engagement, can enable children as well as conventional audiences for art, to achieve a more complete ‘embodiment’ in their encounter with the world.

Significant elements in the workshop

We started out our planning of the workshop by discussing possibilities of mutual aesthetic elements in the different art forms we were teaching in. We wanted to investigate how these would be used according to the context. We also wanted to work in an interdisciplinary way in that our different subjects should function as a unity in a whole process. From these discussions we extracted four different key concepts that we wanted to investigate:

- space
- time
- movement
- sound

In the following we will try to show some of the work and experiments we did with the students and the children during the workshops. However, while working in the workshops we constantly analysed and discussed our working process. You may say that we increased our research to focus on our own participation in the creative processes. In the light of the role of the teacher we can articulate an active action-research as our research method, in the way that we ourselves are the subject of what is going to be investigated. We are and do take part in a dialogical creative process with the students and the children. In this way it is our subjective experiences and focus that is the basic of this research.

Focusing on the significant elements listed before in the perspective of teaching creative processes we have listed the following questions that we feel we need to address:

- What is space & movement in creative work with art & drama?
How do students & children use space & movement in a creative process?

What are the significant elements in a creative process?

How can we work with these elements in teacher education?

Students and children playing

One of our main areas of investigation was to see if it was possible to work with space and movement in two different art forms. In our scenario we had planned how the participant could investigate these themes through different activities. How is the concept of space and movement expressed in different forms and what happens when we try to focus these common elements in creative expression?

The eight photographs show instances of students and children exploring and ‘playing’ with concepts of space and movement. In the student sequence there are two examples of a tableau (frozen moment) being constructed with gesture and pose in three dimensional space while their painting shows a work in progress with the students using materials to create space and a sense of movement across the flat surface.

In the photographs of the children moving we can see them exploring the actual space of the classroom by physically inhabiting it and moving around in it. Whereas the student gestures are static and declarative, the children’s movements capture the energy of the moment and show them as being within the process of changing into and becoming cats with ‘catlike’ movements. The painting shows two stages in a child’s depiction of a roar. The bright colours and shapes might indicate the formation of the sound and the idea of sound being ‘within’ the body of the animal while the opening of the shape at the top with parallel vertical lines shows the sound being emitted from within as a loud roar. One could argue that the student painting manipulates the surface area in quite sophisticated ways and that previous experience of working across and filling a large surface with colour, line and texture is apparent, whereas with the child’s painting it is the sound which is the main creative force behind the image and that the materials are chosen and used to best express that sound.

There is another sequence of painting where the child is creating the sound.

He was not talking but other children were talking about their stories as a kind of narrative. However, if we talk about sequence or even narrative it’s difficult to say that the child is telling a story here. Maybe the painting itself is the story? The painting is a way to make the sound. The space and materials of the painting allows the sound to be made. The painting in both of these cases provides an arena and a vehicle of expression, but it is the sound that is most important.
Exploring space and using spatial awareness

Here the students experiment with telling a story through using the space. So they use different levels, and by gestures they can indicate distances. By moving the paper they can manipulate the movement of the paint – in that way they can mark out and describe a space.

This painting shows how a child uses different tools to make different types of space. He was very focussed and clear about what he was doing. There is an instinctive awareness of how, in the exploration of the space of the painting, he is going to tell the story.

In this painting two children decided to work together. Starting from each end they met up in a mutual story with paint. It was a lion and we think it was in a zoo.

Reflections on creativity

There is an interesting difference in the way the students and children worked. Whereas the children told their ‘stories’ with gestures and the materials of paint and paper the students would often revert to ‘clichéd’ movements, actions and markings. This tended to indicate an anxiety with the process and also a need to arrive at a pre-planned ‘solution’ to the problem or questions posed?

There are implications for our teaching of children and adults. Where do the adults originally form these clichéd symbols? At what point in their education do they become a dominant mode of discourse? Is the ability of an artist something to do with the capacity to ‘unlearn’ things (for example, technical skills) so that one can engage with the process in a freer way?

Different aspects of ‘practice’ whether in the studio, theatre or classroom have different tensions and contradictions. The individual artist in the studio is free to take risks and to learn to tolerate difficulties and, sometimes, failure, while a player within an ensemble has to learn to play and experiment within a larger, more overarching framework, with concepts of ‘risk’, ‘experiment’ and ‘failure’ taking on different connotations. Similarly, the teacher working with children at any age is faced with the contradictions between allowing the child to explore and experiment freely, whilst also being subject to the external pressures of school curriculum structures and parental expectations.

As Elisabeth Nordin-Hultman argues, ‘today each child is judged, described and discussed in a more thorough-going way than ever before and more children are considered (as) having special needs.’
She goes on to query the grounds and criteria by which such judgements are made and asks, ‘how is the educational context planned that makes so many children appear with lacks and difficulties?’ (N-H:2004:206) She argues that it is the educational context which is most often taken for granted and omitted from the different factors which affect children and their learning. An issue teachers have to deal with is the question of how to balance one’s individual beliefs and philosophies within an increasingly constricted and legislative framework. This can often mean that the opportunities for creative approaches in one’s teaching and chances for risk taking are minimised. ‘Processes and problems are individualized, while the educational context more often is taken for granted and left without reflections.’ (N-H:2004:206)

**The aesthetic dimension of children’s play**

During our analysis of the work we were doing with the students and the children we questioned just what are the significant elements in a creative process. Furthermore do we consider these in teaching students and young children? We believe that one of the most important elements in teaching is the relationship of the participants in a group. You can also say between the teacher and the children. In the teaching of young children one has to be aware of the way children communicate through aesthetic form. Being aware of this you can use elements from children’s spontaneous symbolic play in your relationship with children which recognize the child as an individual and creative subject.

So far we have become more aware of the work we have done in order to create communication in a creative process and we want in the following passage to draw your attention to some of the phenomenon that we think are essential in that work. In playing, children investigate ideas and forms through experimenting with objects and themselves, or themselves in the playing process with other children. You can compare children’s playing with an adult’s improvisation and look upon it as a ongoing process between different parts or participants.

**The continual back-and-forth movement between two poles, in which neither of the poles represents a goal where the movement should come to rest.**

(Hands-Georg Gadamer in Guss 2004)

Through her research Faith Guss points out that children are mainly communicating through the use of symbols in spontaneous play and this way of communication can be considered as a cultural production where the child gives aesthetic form to thoughts, ideas and feelings. In playing, the child intuitively uses means from adult theatre art, which integrates numerous different art forms, and which can be represented, for instance, through movements/dance, voice/singing, costumes, props and three-dimensional scenography. The aesthetic expression is individual and related to whatever makes sense (or which creates/gives meaning for/is meaningful) to the child at the moment. Children in a complex developed symbolic play continuously differ between reality and fiction. They “step out” of the fiction for instance to instruct or to carry on the narrative part of the play. Or the child may have a need for a certain prop for continuing the play. You can see how children during the play will take different functions to keep the play going such as an instructor, as a scenographer, a narrator, a dramaturg etc.

Guss discusses two forms of symbolic play: a) the social-realistic play, where children imitate and reproduce their experiences in a naturalistic, realistic form language and b) the fantasy play, where the child get into the transformation and interrogation of their experiences from their own point of view. These forms are both used by the child while playing, and this is something we experienced in our work with the students and with the children. Through playing you introduce & develop concepts. Playing offers the opportunity for the child to find a ‘potential or transitional space’ in Winnicott’s terminology (see Winnicott:1974) where he can distinguish between the ‘me’ and ‘not me’ This a personal but can also operate as a wider cultural space. Concepts can be represented through the creative process (ie within the game or action or painting) and concepts/understanding can be represented through symbols.

**Improvisation**

Improvisation is a process in which you are acting in the moment and where you spontaneously make decisions based on intuitive reflections. When you improvise you articulate something through a media. You can say that improvisation is a dialectical communication which is going on between at least two parts - for instance two people moving or talking together, a child shaping a lump of clay or a child investigating the bodily possibilities in a given space.
To act in an improvisation you have to concentrate and being physically and mentally present in the moment. It affords that you can take initiative as well as you are sensitive to your surroundings - your context, and be able to use the information or ideas you get from the other part(s). In that way you can say that there is a dialectical process going on continuously between you and your surroundings, or between you and your materials.

Bjørn Kruse (Kruse 1995) refers to that an improvisation always is related to “something else”. You can look upon that as the creative criteria for the improvisation and these criteria are created all along during the creative process. That means that what you just did is the foundation for what you will be doing further on. During an improvisation your consciousness is directed into three layers - the past - the present - and the future. The creative criteria are made from your consciousness about what is being created in the moment and how that relates to what has happened previously and what is going to happen next. That is what Kruse refers to when he is using the term “intuitive reflection” (Kruse 1995).

Dialogue
In our thinking about the project we tried to identify some key aspects which underpin our teaching and pedagogical philosophies. We feel that teaching should be dialogical, improvisatory, process-led and that teaching itself is a kind of provisional text. The research of Berit Bae is troubling the validity of children’s experiences and expressions and preschool teachers’ recognition of children’s subjectivity which is emerging through the dialogue.

Creating dialogues which involve meeting children with recognition is not a static thing that can be easily defined and categorized. Mutual recognition must be understood as a processual phenomenon, which changes over time with individual persons, and includes adhering to the diversity that exists within a preschool group.

(Bae 2005)

Teaching through creative processes whether it is with children or with students implies a dialogue between the teacher and the child/student which pays attention to this process. In the creative process the child/student expresses his/her subjectivity through transforming ideas, thoughts or feelings into sensed form. This process is an ongoing dialectical meeting between “me” and the opposite – the world. The teacher’s awareness of being a part of this process requires communication in a ‘recognition’ which attends to this individual process of the child or student.

In the first picture the teacher is starting the dialogue with the children about cat animals by showing them a toy cat. This begins a dialogical process between the participants.

From our perspective as an art teacher and a drama teacher we focus on non verbal expressions. We want to emphasize that you constantly communicate non verbally through various ways, for instance the way you are placed in a room, the way you physically are related to the people you are communicating with, and through the use of bodily expressions. However in the context of creative processes like play or a teaching process you’ll have even more sophisticated use of non verbal expressions through aesthetic expressions.

During the analysis of our work we have reflected on the ways in which we communicate recognizably through non verbal expressions and actions. We believe that this perspective is a significant part of our actual way of communicating, although, generally, in pedagogical theories it is given little attention.

This theoretical perspective also conceptualizes relationships as changing processual phenomena and
underscores the reciprocity between partners in interaction. Analysing dialogues using this line of thinking enables us to describe both children and adults as changing subjects creating predispositions for each other.

Main issues and reflections
A project like ours is itself a ‘work in progress’ and our findings provisional. There are many other complex issues which we could focus upon. For example, about processes of working in an interdisciplinary way between different art forms, finding commonalities and differences between the art forms, about the interactions between us as teachers, the ways in which our different understandings of languages coalesce, and also about the use of photographs in research.

Having acknowledged above that we both have strong philosophies about our role as teachers of the arts, we are forced at this moment to consider how do we teach a pedagogic philosophy, can we teach it, or whether we should even try? We believe fundamentally in the idea of sharing experiences. What is important to us is the idea of children deciding, of the importance of listening to children and about going into a process with them and accepting their ideas. Perhaps this philosophy of creative working and collaboration is one of appreciative communication.

Drama and art constitute their own ‘language’ of material, medium and symbol. John Willats points out that whereas children have to learn to understand language as well as to speak it, the ability to understand pictures (and I would add dramatic action and form) is more innate. (Willats:2005:13) It’s worth thinking about how parents and children frequently use pictures and movements as a visual aid to learning a language. It is as if pictures and gestures act as symbolic representations of individual words or phrases.

We found that there were different modes of ‘communication’ taking place. In the dramatic episodes the children were able to enact movements or gestures or feelings in actual 3D space. In the painting the organisation of space involved the transmission of those same movements and gestures onto a flat 2D surface. The fact that some children made commentaries upon their work in progress while within the dramatic ‘play’ or during the painting points to their ability to structure a narrative involving character, actions and time, as well as distance and space. It also indicates an ability for young children to structure their narratives between such different spatial art forms as constituted through drama and painting, and an ability to handle the complex differences between the ‘actual’ space of the dramatic action and the ‘virtual’ space of the painterly construction.

Claxton describes the process of ‘focussing’ and ‘embodied cognition’ (Claxton:2006:354) whereby the ‘felt sense’ of something (like a problem to be solved) helps connects the body with one’s system of cognitive processing. This kind of knowing ‘requires us to be able to go ‘back to basics’; to start with the complicated, murky ‘felt sense’ of the predicament, and then slow down the process of epistemic evolution so we can a) see more clearly what kinds of assumptions we might, unconsciously have been stirring in to the conceptual mix and b) allow the emerging conceptualisations to be driven, and continually refined, by the felt sense itself rather than forcing it to fit the pre-existing templates, categories, habits and phrases that we happen to have installed in the skill-scape and the word-scape.’(Claxton: 2006:356)

Crossing the domains of art, music and drama was a productive experience and enabled us (as teachers and artists) to be more open minded. We talked about breaking down barriers between the art forms, and about how we can utilise and experience aspects of time and memory by bring both body and mind into play through these art forms. The philosopher Merleau-Ponty conceives of the body as being ‘essentially an expressive space’ (MP:2002;169) and that ‘whether a system of motor or perceptual powers, our body is not an object for an ‘I think’, (but) is a grouping of lived through meanings which moves towards its equilibrium.’ (Merleau-Ponty: 2002;177). We felt that such a creative project can enable children to achieve an enhanced sense of their individual selves, and how each of us can offer something unique within the context of a shared experience.
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Development of movement notation language among fourth grade children
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This article is about the development of movement notation language by children. However, before we explain why this development is important, it is necessary to explain why notation language for teaching movement and dance is essential. Scientific disciplines, such as physics, mathematics, and geography are taught using symbolic representations of the material learned: numbers, formulae, maps, etc. Nobody could conceive of engaging in these disciplines in any other way. Music, too, is taught using symbolic representations: musical notes. It is difficult to imagine any professional study of music without considerable use of notes, for instance, but only through listening, mimicking, and improvising.

However, movement and dance are for the most part taught without the use of symbolic representation. That is done, mostly, in two ways: exposure to patterns and conventions of the different movement styles through imitation and encouragement for independent creation and expression through improvisation and personal composition. All of this is, of course, very important but is it enough? Is a fundamental element not missing: the possibility of reading movement notes, of discussing the relations created among the elements of movement through them, and notating the results? For this purpose, it is necessary to develop ability of ‘movement literacy’, as discussed later in this article.

If we accept that the use of symbolic languages is important in the teaching of dance, as in other areas of teaching, we arrive at the second part of the argument. The mechanical use of symbols that the teacher employs in class, such as repeating formulae and copying notes, may make it difficult for the students to understand their full meaning and to use them effectively. More creative teaching, in the constructivist approach, in which the students themselves develop symbolic ways of expression, will help them better understand the accepted languages through which the material is learned, whether it be science, music, or movement and dance. Various research in the disciplines of teaching the hard sciences, as well as in music, engaged, therefore, in the way in which children develop a symbolic language by themselves in these disciplines and what can be learned from it. In the field of movement and dance, to the best of our knowledge, the process that examines how children develop a symbolic language by themselves and what can be learned from it has yet to be examined. The research that we describe in the following pages is intended to be a first step in filling this gap.

Movement Notations – Representation Symbols for the World of Movement

Movement notations constitute methods of notation that represent, as a product of an analytic process, different elements of the movement world. The representation of phenomena from the world of movement is enabled through the use of movement notations, so that they can be performed, studied, and discussed. Thus, it is possible to expose features in complex movement phenomena, evading the limitations and connotations that co-occur with the discussion of them through a verbal medium (Farnell, 1994) and to thoroughly institute different concepts from the field of movement. Movement notations known in Western culture are: Benesh notation (Benesh and Benesh, 1956); Laban notation (Laban, 1956, 1975); and Eshkol-Wachman (EW) notation (Eshkol and Wachman, 1958). However, the fact that a comprehensive uniform communicative system does not exist may indicate the complexity of the field and the difficulty representing it symbolically (Drewes, 2003).

For the purpose of the present study, Eshkol-Wachman movement notation (EWMN) was selected (e.g. Eshkol and Wachman, 1958; Eshkol and Harries, 1998, 2000). This notation allows the analysis of the body structure and its movement in time and space based on a system of reference that can be numerically expressed. The expression and symbolization of the information on the page is conducted through a limited number of numerals and accepted graphic symbols, the combination of which allows the description of all the accepted body movements. The manuscript itself can be adjusted and designed according to the required information and the level of the chosen observation and resolution. In the fifty years that have passed since the publication of EWMN, it has been used for research, analysis, and creation in a variety of areas of movement and dance. Selected references are given in the bibliography.

Movement Literacy

The concept of literacy links expertise and proficiency in a certain field to creating an awareness of language, through the ability to implement a scheme of cultural means and to present them in an agreed-upon manner (Barton, 1994; Olson, 1994). On that basis one of us offered the concept of ‘Movement
‘Movement literacy’ means the ability to conceptualize, symbolize, read, and write movement, as well as to move according to what is written. Thus, the learner develops a network of knowledge and skills that pertain to the human body structure and movements in time and space. The expression of the learners’ inner world is emphasized by legitimizing the use of a variety of modes to represent movement phenomenon.

**Symbolic Representations**

Thinking and communication among people is characterized by the ability to design and represent items and concepts using symbolic means. The science of symbols, *semiology* (deSaussure, 1916/1974) or *semiotics* (Pierce, 1906), engages in the research of language and other systems of symbols and in the way in which they influence and shape human perception and consciousness. The fundamental assumption is that the encounter with many viewpoints in the world occurs through symbols that never represent the objects of the outside world in a complete and precise manner. These symbols are deciphered and processed through systems learned and integrated in the processes of socialization.

According to the approach of Vygotsky (1981), the symbolic languages constitute formal systems of representation with unique modes of symbolization—resembling inner tools used to direct the individual in his conduct in society and that constitute a basis to develop higher cognitive abilities in different areas. Thus, natural psychological functions (such as attentiveness, perception, recall) develop into higher mental functions (such as: language, abstract thinking). Cultural tools such as language, numerical systems, diagrams, maps, and symbolization systems categorize realities, direct thinking, and enable the expression of abstract ideas. This process enables the development of conceptual and scientific thinking, liberates the individual from dependence on immediate perceptual experience, and creates the possibility of representing the past and planning the future.

The development of symbolic language, therefore, enables the development of a higher-level knowledge in a domain: discrete data can be put into context; phenomena can be exposed; laws can be expressed; generalizations can be made. The process of representation in a written manner enables the discussion and manipulation of the information in various ways, so that comparison and conclusions can be made. In various fields of science (e.g. physics and geography) designated symbolic languages were created that are used for communication and the development of knowledge in the field. In the field of the arts, music has reached the rank of complex symbolic representation, which aspires, according to some theoreticians, to enable complete and precise representation of the presented content precisely and completely. Whether a system of notation should characterize every discrete event in a certain area in a one-to-one manner (Goodman, 1976) or prefer a structural inclusive perception of notation and representation raises controversy (Elkoshi, 2000; Goehr, 1992).

**Development and Learning**

The ability to communicate through symbols is a dynamic process that requires the realization of the potential of the cognitive processes such as coding, inference, and association (Deacon, 1997). This ability develops gradually and forms its basis throughout the years of childhood, attaining control of the systems of representation accepted in society, and effective functioning in this framework. By the age of six, the principal understanding of the use of symbolic systems is completed and it is possible to identify in the concepts of Piaget the transition from cognition and symbolic-concrete representation to abilities of abstraction and generalization of data (Piaget and Inhelder, 1969). In the framework of learning processes and information processing the use of systems of visual-symbolic representations is common. These representations, which express content of a certain spatial constellation graphically and in functional space, differ from images, in that they reflect a conceptual perception of the reality and not an expression of sensory retention (Tversky, 1999).

The use of a communicational system of visual-symbolic representations requires two types of cognitive activity: (1) reading from, or encoding into, the symbolic representations; (2) processing the information on two levels: symbolic and semantic (Kaput, 1987). Research has found that the contribution of symbolic representations of learning may be expressed in a number of ways: in-depth understanding and construction of a more complete and cohesive mental representation; dissemination and transfer of information without changing the mode of representation or influence on its meanings are enabled. It was found that visual representations of information considerably enhance recall.
Independent Development of Representations

The development by learners of visual-symbolic representations is based on the value of the use of such representations, but is also anchored in a constructivist approach towards learning and knowledge structuring (e.g. Bruner, 1996; von Glasersfeld, 1987). Developmental processes of representations may promote development of learners from a number of viewpoints (diSessa, Hammer, Sherin, and Kolpakowski, 1991; Sherin, 2000). The process allows for the expression of accumulated experience and abilities of children involved in the activity of representation, originating in the earlier stages in their lives. The process of representational development allows for bridging the gap between the learner’s existing knowledge and the knowledge he has recently acquired, through the inculcation of personal meaning for the new information. Illumination of the latent aspects of comprehension, knowledge, and cognition of the learners is enabled, thus revealing of misconceptions and soliciting in-depth understanding of basic concepts. The developmental process of the representations creates an opportunity for the creative involvement of the learners: rights towards their ideas, and feelings of identity and self-esteem. These aspects, which were expressed during the development of the graphic-symbolic representations of movement by the children, also have a role in the development of an infrastructure of ability of representational and meta-representational thinking (diSessa and Sherin, 2000).

Description of the Research and Preliminary Data

Method

On the basis of EW movement notation and the accepted terminology of the previously described research, our research defined four dimensions of movement: the dimension of the spatial ‘relative directions’ (forward, right, …); the dimension of the spatial ‘absolute direction’ as defined in EWMN (similar to the ‘compass rose’ but symbolized using the numbers 0-7); the dimension of the body limbs, and the dimension of the relative movement time (what moves first, what moves together?). The ability to symbolize these dimensions as a whole was defined as the ability to symbolize movement. A designated curriculum was developed in which the children acquired the concepts of movement, practiced them, and gradually developed an ‘independent notation language’ for movement.

The program was learned during 2006 and in the beginning of 2007 in an elementary school in central Israel. The children who constituted the research population chose to participate in the course for ‘movement language’. The research population, which consisted of sixteen children, was divided into two sub-populations: (1) ‘developers’ and (2) ‘decipherers’. Together they participated in the stage of the study of the units of movement in the research (the stage of ‘inculcation’) and thus all the children developed a shared movement and conceptual basis of knowledge. Next, the ‘developers’ engaged in developing a communicational system of visual symbols (movement notes) for the concepts that were taught. Later they improved it in light of the feedback they received from their peers. The ‘developers’ worked in four separate groups, each staff consisting of three to four children. The ‘decipherers’ decoded the notes that their peers developed and performed them. Every group of ‘developers’ was assigned a fixed ‘decipherer’ to allow the development of internal knowledge within each individual team. Twenty nine lessons were held, photographed, and recorded. During these lessons three types of data were collected: (1) transcripts of the children’s conversations while working on composition, decoding, and improvement of notes, (2) films documenting movement performance of the children both in the inculcation stage (shared learning) and during the decoding (translation of the notes to movements), and (3) ‘scripts’, ‘movement notes’, that the children developed for movements presented to them.

Process and findings

The following is an example of the first lesson, in which we dealt with advancement to the spatial ‘relative’ directions ‘forward’ and ‘backwards’.

1. The inculcation process – The children experienced different ways of advancing to the spatial ‘relative’ directions ‘forward’ and ‘backwards’ (such as walking, jumping, crawling, etc.), when the external-spatial point of attribution changed (e.g. facing the door or the windows). The goal was to create abstraction and generalization of the relevant concepts and to disengage them from the mode of advancement or external direction.

2. After the inculcation, the ‘decipherers’ left the room and the development groups were shown the following series of movements (using a pre-prepared film):
3. Each one of the four groups met in the corners of the room and formed an appropriate means of graphic expression, which, in the group's opinion, could be understood by the decipherer.

4. At the end of the process, the decipherers entered the room, and attempted to comprehend the movement sequence from the ‘script’ they had received from their respective teams.

The following pictures present the scripts that describe this sequence, accompanied by a short explanation.

<table>
<thead>
<tr>
<th>Movement notation</th>
<th>[0]</th>
<th>[0]</th>
<th>[4]</th>
<th>[0]</th>
<th>[4]</th>
<th>[4]</th>
<th>[4]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal translation</td>
<td>forward</td>
<td>forward</td>
<td>backward</td>
<td>forward</td>
<td>backward</td>
<td>backward</td>
<td>backward</td>
</tr>
</tbody>
</table>

3 A

3 B

4 A

4 B

In script 1A it is possible to identify an ‘abbreviated’ manner of writing in which numbers indicate the amount of steps that should be taken in succession in every direction. The directions themselves (forward and backwards) are symbolized by arrows pointing up and down. Feet placed on a surface (line) are drawn to depict walking and not another form of advancement, such as jumping (according to the analysis of the conversation among the children). Notation of the direction of reading does not exist (whether to begin from above or from below), but research shows that beginning from above is a culture-crossing convention, in the case of vertical writing/reading. This version was deciphered by the decipherer erroneously – as only four steps – and the group improved it to script 1B, which presents each step separately. In this script the numbers represent both the amount of steps [1 in a circle] and the order of the movements [the numbers 1-7 on the right].

In the script of group 2 a profile of a figure standing was chosen (one of the girls ‘modeled’ while her friend drew her), since, according to the children’s conversation, it is possible to draw and understand relatively easily the directions of forward-backwards on a page.

The directions of the advancement ‘forward’ and ‘backwards’ are symbolized here by arrows that address the direction of the figure; the numbers
represent the order of the steps, which was written in the center of the drawing (from the figure) towards the outside (with the exception of the deviation in the number 2).

In the script of group number [3], some of which is presented here, it is possible to see the use of three forms of symbolization: familiar iconic symbolization of a hand with an index finger – ‘forward’; the Hebrew letter Aleph (א) in reverse (‘so that it won’t be too easy’) – ‘backwards’; and numbers denoting the amount of steps using the laws of arithmetic language the children know for the purposes of multiplication.

The script of group number [4] is built from icons of doors, opened and closed, to which arrows that indicate ‘into’ the open door (forward, arrow up) and ‘out’ of the door (backwards, arrow down). Here, too, the starting point and the direction of reading were not indicated.

The scripts presented previously all show the first movement sentence, the simplest, in the eleven sentences examined in the process. These constitute an example of the variety of possibilities of representational-visual expression of the single movement dimension defined in movement – the advancement in the directions of the body forward and backwards. It is possible to see the use of different types of symbols – conventional (letters, arrows, numbers, use of principles of familiar arithmetic language) as opposed to iconic (figure of the girl walking, open and closed doors). It is possible to discern detailed representation, in which every movement receives separate representation, as opposed to use of formulae that shorten the writing process. The numbers are used to represent different aspects of the elements of movement – quantitative, ordinal, and spatial. In addition, there is use of the two dimensions of graphic space – vertical and horizontal.

The following movement sentences and the scripts created according to them, some of which will be shown in the presentation in the conference, included the gradual reference to a steadily increasing number of movement dimensions and constituted a challenge of representational-graphic conceptual-movement complexity.

Discussion
Movement phenomena are by their very nature complex and multidimensional: the entire moving body operates in time and space. Sometimes there is the desire to express ideas, to create an aesthetic visual presentation or simply to enjoy the sheer experience of movement. Examining teaching and creating processes shows that the world of dance for the most part utilizes two methods: on the one hand, imitation, and on the other hand, independent development (improvisation). The presented research examined a third way, which allows for the establishment of conceptual and movement differentiations and encourages the performance that results from the understanding and processing among the learners.
The advantages that may stem from the combination of the graphic-symbolic presentation and the world of movement performance, and the possible contribution to both the world of the art of dance and of education and learning include:

1. The presented work method is based on the approach of ‘movement literacy’. In this manner, the ability to create differentiations and generalizations in regard to the basic concepts in the world of movement and to establish them (such as, for example, the definition of the movement direction for ‘forward’ independent of an external point of reference or of the manner of advancement) is revealed.

2. Experimentation is enabled in different modes of representation of certain types of knowledge (movement, verbal-conceptual, and graphic) and the transference between the two. Thus, the learners are encouraged to examine and choose appropriate modes of representation and cope with both major and trivial aspects regarding the representation of movement phenomenon. In addition, the merits of the ability to encode and decode certain information in different systems of symbols are emphasized, as in the writings of Eisner (1994).

3. The solicitation to use personal graphic expression allows a ‘glimpse’ into the latent thinking processes that pertain to the movement contents. This ‘glimpse’ is carried out by examining the relationship between the graphic symbol and what it symbolizes (the movement content) and the proof is the unique and different ‘movement notes’ that were created in each one of the groups for identical movement concepts.

4. Coping with the transition from three dimensional (movement) to two dimensional (graphic) phenomena led the participants to discuss the two elements of the process – on the one hand, the body structure and the movement in time and space and on the other hand, the possibility of representation (e.g. the choice to draw a profile that will allow the revelation of the physical directions of forward and backwards).

5. In regard to the process of symbolization as a whole, it is possible to examine which fundamental concepts and basic rules in the domain of symbolization are common and known among the children and which erroneous assumptions are integrated by the children from the curricula and from the social discourse (e.g. although use is made of numbers to represent three different aspects of content [quantity, order, and space], these functions were not defined clearly even when they appeared together). In other words, use was made of a constellation of known symbolic representations without a ‘key’ or legend.

6. From the aspect of communication patterns among children, the question of who bears the responsibility for understanding and decoding messages was revealed. If the graphic message is not understood, is it ‘her problem’ (the problem of the decipherer – the recipient, as the children stated) or am I, the sender, responsible for the proper understanding of the message (in this case, the movement)?

7. From the practical standpoint, understanding the processes of cognitive development in the field of movement will allow the preparation of learning materials to focus not only on the motor aspects but also on thoughts of movement and the ability to communicate through it.

The world of movement knowledge is known to everyone since every person in the world moves. However, this field, for the most part, does not reach a level of literacy expertise due to the lack of awareness on the one hand, and lack of research instruments and observation on the other hand. In the comparison to other art fields (such as music) and sciences (such as physics), the realm of movement is lacking, both in the scholastic-educational context and in regard to its place in the academic world. The development of didactic methods and research that link the experience of movement and dance to the established and known corpuses of knowledge constitutes, in our opinion, a challenge for us, the people of the art of dance. We hope that the method presented here will facilitate the promotion and development of the relationship between these two worlds.

References

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Including middle school art teachers on interdisciplinary teams: A case study
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Arkansas State University

How to Be An Art Teacher…

Attributed to S. Costello Brownell and Kay Broadwater in School Arts Magazine.

Introduction
An exemplary middle school enhances the development of adolescents. The curriculum, methods of instruction, physical structure of the building, and the middle school personnel, work together to form a student-centered organization. Such an organization helps the learners feel safe and experience success. The National Middle School Association issued a definitive statement of the role of the middle school titled This We Believe (1995). This statement defined key elements of the middle school as integrated curriculum, interdisciplinary teams, exploratory activities, and advisory programs. An exemplary middle school will incorporate all key elements.

Interdisciplinary teams determine the success or failure of these elements to enhance the development of young adolescents. Allen, Splittgerber, and Manning (1993) define an interdisciplinary team as consisting of two or more teachers, representing different subject areas, who share the same students and schedule. This team accommodates the instructional needs of the students through curriculum planning. The team may include exploratory course teachers, such as the art or physical education teacher, although these teachers rarely have common planning time with the team. We have investigated the inclusion of art class teachers in middle school interdisciplinary teams, delineating the advantages of the inclusion as well as problems created by it. Exploratory courses cover a wide range of subjects. We selected two middle school art teachers as examples for this study.

Bergman (1992) states that exploratory course teachers may feel less important than academic core teachers. Participation of exploratory teachers in interdisciplinary teams enriches interdisciplinary units and empowers exploratory course teachers. This study focused on findings that affected the relationship between the middle school art class teachers and the academic interdisciplinary teams.

Interdisciplinary Teaming
Essential components of a middle school curriculum include an academic core, art education, physical and health education, technology, integrated curriculum, and exploratory curriculum (Allen, Splittgerber, & Manning, 1993). Combining the essential components of the curriculum with the key elements of middle school requires planning by teachers and administrators. Middle schools in the United States vary in the extent to which they incorporate the key elements. Some schools are middle schools in name only. These schools are essentially junior high schools with departmentalized subjects and few middle school characteristics. Other middle schools more fully reflect the vision of the National Middle School Association stated in This We Believe (1995). Lounsbury (1992) states, “Connecting the curriculum via interdisciplinary instruction is not an optional activity for middle level educators -- it’s mandatory” (p.1). He believes that the integration of subjects reflects the fundamental idea of what and how students learn. James Beane (1993) is a champion of the integrated approach to middle level education. His research demonstrates that curriculum should use thematic strands. These strands should be studies in a real life experiential way, not in separate subjects. To integrate the curriculum requires interdisciplinary teams that reflect all subjects including the exploratory courses.

An additional facet of arts education related to the middle school objectives is reported by Americans for the Arts (2007). They state: “Young people who participate in the arts for at least three hours on three days each week for at least one full year are 4 times as likely to be recognized for academic achievement, 3 times more likely to be elected to class office within their schools, 4 times more likely to participate in a
math and science fair and 4 times more likely to win an award for writing an essay or poem.” Students identified as young artists perform community service more than four times as often as their peers. Clearly the integration of arts education with interdisciplinary teams would benefit both.

Common planning time for interdisciplinary team members is only possible when the students are under the supervision of other staff members. In many middle schools this time is when the students are in the non-academic core or exploratory classes such as art, career guidance, or physical education. To accommodate planning within the school day, teachers of subjects other than the academic core become the means to create time for team meetings. In schools where block scheduling of the core classes is used, art teachers report difficulty in having the time to work with talented students. This is generally because the art classes become larger to accommodate less motivated students (Hassenpflug, 1999) and discipline deteriorates. The arrangement of using exploratory class teachers to furnish team planning time creates an unfortunate paradox. For example, the middle school curriculum is student-centered. Art education has a long history of student-centered thinking (Simpson, 1996) yet the logistical dilemma of scheduling time for teams to meet prevents many art teachers from participating in the formulation of integrated curriculum. Academic core teachers report higher job satisfaction with teaming (Erb, 1993). In contrast, the art teacher may experience isolation more keenly in a middle school setting (Anglin, 1993). In a study, Anglin found that middle school art teachers generally created and implemented their own curriculum. No information in the study indicated that the art teachers planned curriculum as part of an interdisciplinary team. Our study focused on these questions:

1. What is the relationship of the art class to interdisciplinary teaming?
2. What is the relationship of the middle school art teacher to the interdisciplinary team organization?
3. How is the middle school art education program viewed by the art teacher?

We are concerned with the fate of art programs for middle schools. Art programs and art teachers can become estranged from interdisciplinary teams or they can become valuable members of those teams. Relationships should be developed which are beneficial to both art programs and interdisciplinary teams. Gude (2007) expresses concern that the art classes at middle school may be the last art class that students may ever take and that the experience of planning the art curriculum is troubling to art teachers.

Art teachers surveyed about professional development (Jeffers, 1996) indicated the low status of art is a problem. Teachers also identified curriculum as a current concern. Teacher preparation and accountability issues received attention. Of interest to middle level advocates, beginning art teachers identified integrating art with other subjects as an area of concern. The emphasis of art programs in the middle level is on media and production. An individual art teacher may function as the key to the success of an art program (Ciganko, 1992). Ciganko believes that art teachers may become “taken-for-granted” causing them to become disillusioned with their profession. The National Art Education Association (2007) has identified the need for an ongoing research agenda. Among many questions, they are seeking information about who is teaching the arts, the curriculum of the arts in various settings, and how students learn.

The Case Studies:
Case studies of art teachers were done to provide a careful examination of the relationship between art programs and interdisciplinary teams in the middle school. The primary research techniques were interviewing, observing, and document collecting. The following questions guided the research.
1. How does the middle school art teacher function as a member of the interdisciplinary team?
2. How is the art program integrated into the interdisciplinary team plans?
3. What is the status of the art program in the middle school curriculum?
4. How can art classes be used more effectively in the interdisciplinary teaching process?
5. Do local standards for art instruction in the middle school meet state standards?
6. Do local standards for art instruction in the middle school meet national standards?
7. How is the middle school art program viewed by the art teacher?
8. Is there an established hierarchy in the interdisciplinary team to which the art teacher belongs?
9. If a hierarchy exists, is the art teacher included?
10. What is the role of the administration of the middle school in integrating the art teacher into the interdisciplinary team?
11. What is the history of the integration of the art teacher into the interdisciplinary team?
12. Does the location of the art room in the middle school affect the status of the art teacher?
13. What are the advantages to having the art teacher included in the interdisciplinary team?

14. What are the disadvantages to having the art teacher included in the interdisciplinary team?

Theory about middle school organization abounds. The efficacy of the middle school originates in the theory that a more caring and personal environment teaches young adolescents better. The value of the individual is linked to middle school philosophy. Exploratory classes enhance individual development. The hypothesis that exploratory classes afford an optimum setting for middle school instruction was key to this study. Yin (1994) lists four types of design for the case study strategy. A single-case embedded design was appropriate for the study and revealed both positive and negative aspects of the relationship of art classes and interdisciplinary teams.

Case Study 1

The teacher, identified as Ms. A, was a member of an interdisciplinary team of fifth grade teachers at a newly constructed middle school. The principal who placed her on the team felt confident that she would be an important member of the team. He openly praised her ability to see the “big picture” of middle level education as well as her willingness to engage in interdisciplinary planning. The school itself was constructed with the plan of individual teams placed in a wing of their own with all core courses taught in that area. Exploratory courses were located in separate areas. Ms. A. was given a room in the team area where she met daily with her advisory group. At all other times and for art instruction, she returned to the art room which was some distance from the team area.

Because the exploratory teachers’ classes were used as the means to free teachers for team planning time, Ms. A. did not meet with her team during the day. The core class teachers met daily as a team in addition to having an individual planning time. Ms. A. did have individual planning time with one of the team members. Initially there had been some team meetings planned where Ms. A. was included, but these had largely been discontinued due to time constraints. Ms. A. came to the middle school enthusiastic and excited about her role in the new grade level arrangement. She believed that the principles of the middle school were right for adolescents and that she would be an asset to the program. She had begun her career as a junior high art teacher and welcomed the opportunity to move to the middle school. In preparation for the new position, she had taken classes and researched middle school goals. The optimism of Ms. A. was apparent in her interviews and in her diary entries. She spoke often about feeling she could be helpful to the team and offering her talents to the team. In reality, the team often functioned without input from Ms. A., who expressed concerns such as “I can’t get them to use me.” An example of this was the decorating of the team area in a castle motif. Heraldic-type shields were made by the students and hung in the hallway but the art teacher was not consulted about the project although she might have offered many useful suggestions about materials and helped with the construction of the shields. Ms. A. planned her own curriculum, relying on state standards to guide her. Her classroom was inclusive with students coming from resource areas to participate in the art class. She had earned a Master’s degree in Art; experiences in her classroom ranged from drawing and painting to crafts, with more emphasis on creating products than on the art history and appreciation areas. Ms. A. remained very positive about her experience with the team, stating that she felt in time she would be more included on the team and that she would continue to offer her expertise in art to her partners. She believed that art could fit with any other subject to be a valuable addition to interdisciplinary and cross-curricular planning.

Case Study 2

The teacher in the second case study, identified as Mr. B., was not assigned to an interdisciplinary team. This was in part due to his duty assignment which caused him to serve two buildings as art teacher. He expressed the notion that it would not be fair to a team to put him on one when he might not be able to attend the meetings. As well, his schedule often placed him in the position of furnishing the necessary time for the team members to meet in a planning period. He indicated he would be interested in being on a team if he were in only one building. The principal in the middle school expressed an interest in placing the exploratory teachers on teams but leaned toward identifying a team of teachers who taught the special subjects rather than including them on the core teams.

Mr. B. entered the middle school art teacher ranks from an administrative background. He had earned a Master’s degree in Art, as well as a Master’s degree in Administration and had served as a principal. He believed that his background as an administrator made him more aware of how the art teacher role was assimilated into the middle school. The room to which Mr. B. was assigned in the middle school was located at the far end of one of the team hallways. As a consequence he often came and went during the day with little or no interaction with other people on the hallway. Because his position included two
buildings, this was likely a positive location. The disadvantage of the location was that other teachers in that wing and certainly teachers in other parts of the building had little interaction with Mr. B. Several of the teachers did not know where the art room was nor did they know the teacher even though their students had an art class. Mr. B. expressed much optimism about his role as a middle school art teacher. He reported that since he was not a member of a team, he had sought opportunities to connect his subject with other classes the students took. For example, he had worked with a science teacher to study the effect of sunlight on paper and had helped students construct laminated measuring devices for mathematics. He clearly demonstrated a desire to integrate art with other curriculums.

The curriculum Mr. B. used was based on state frameworks for art. He was responsible for designing his own expectations and assessments. Students were encouraged in the production of art more than in the study of history and appreciation although he incorporated appreciation into the curriculum. The art classroom is inclusive with all students being incorporated. Mr. B. indicated that he felt supported by the administration and he was satisfied in his role. He indicated that he desired an area to display student work. He was challenged to find space to display their work and felt strongly that the display would validate the products created. He also indicated that although the school e-mail system was very useful in informing, he found it difficult to stay informed. This was due in part to his location at two schools and in part due to his lack of contact with other teachers.

Findings
In the study, all art teachers were found to be in compliance with national, state, and local standards for art instruction. Art teachers established their own curriculum within those standards. Middle school philosophy stresses the need for individual accomplishment without competitive interference and the art teachers in the study adhered to this. Students were evaluated on work habits, originality, craftsmanship, and appearance. Students were encouraged to evaluate their own work. Most of the instruction in art at the middle level was aimed at creating art rather than at art history or appreciation.

The administrator of each of the art teachers was supportive of the art teachers and appreciative of the willingness of the art teachers to tend to their own curriculum needs. Logistically, each administrator stated that while they believed that art teachers would be ideal members of interdisciplinary teams, the reality of scheduling often prevented such action. Some art classes were scheduled for only one semester or quarter while core classes were held all year. Some art classes had students going to other elective or exploratory classes such as band and chorus so that the art teacher did not have all the students on the team. Art classes and exploratory classes in general often became the means by which the rest of the interdisciplinary team could have team meeting time. Administrators supported the art teachers in procurement of supplies and space arrangement within their classrooms. They seemed proud of the products created by students in the art classes and encouraged displays of the student work.

The middle school art teachers had received training regarding teaching at the middle level. They had attended workshops, in-service programs and college classes to acquaint themselves with the characteristics of middle level learners and felt that they were sufficiently prepared to instruct young adolescents. All were familiar with the concept of interdisciplinary teaming. We found that the location of the art teacher’s room in relation to the location of the rest of the team is significant in establishing opportunities for interaction and team building through conversation. Art rooms located at a distance from the team area in a school limit the times art teachers are included in both spontaneous interaction and team meetings. Because the art teacher was not included in daily team interaction, they assumed no leadership roles. This was not significant from the art teachers’ point of view. The art teachers in the study served more than one team’s students and were involved only peripherally with interdisciplinary studies. Other teachers on the interdisciplinary teams expressed interest in the possibility of including the art teacher while being unsure how they would be able to utilize the art teacher effectively when they did not share common planning time.

Several advantages are apparent to having the art teacher included in the interdisciplinary team. Key among these advantages is the opportunity to utilize creative talent in displays. Another advantage could be seen in having a person knowledgeable in the use of art materials available for consultation and shared teaching. The flexibility of the art teacher’s own curriculum could be an advantage in designing units of study. A disadvantage to having the art teacher on the interdisciplinary team can be seen in several areas. The scheduling of students in conjunction with other elective areas such as band or chorus precludes the possibility of all of a team’s students being in a single rotation. The reality of scheduling difficulties
makes it difficult to give the art teacher time to teach interdisciplinary units with a team. Common planning time is perhaps the most significant difficulty affecting the integration of the art teacher into a team. Communication becomes limited and the art teachers are not included in all aspects of the team activities. Policies regarding discipline and scheduling of extracurricular activities are often established during team planning time. Consistency with the team policies becomes problematic for the art teacher. To include the art teacher in team meetings might require teams to meet before or after school which is a difficult arrangement for most teams.

Summary
“The arts, like sports, play a vital role in bringing students together and promoting teamwork” (Gregorian, 1997). The art teachers in this study, by training and nature, will be valuable members of interdisciplinary teams if they are fully included in the team. The theory is that personal qualities and skills are what make a valuable team member and that the job of the team is to find a way to integrate these skills. Interdisciplinary teams are as individual as the people who make them up. There are no clear qualifications for membership on a team. Even if there were, and even if a team were required to have an English teacher for example, not all English teachers would make good interdisciplinary team members.

Clearly team planning time scheduling, time management, and even room assignments, place huge barriers to the possibility of including art teachers on interdisciplinary teams. More study needs to be carried out to ascertain the best ways to utilize the creative power available in the elective course faculty members such as the middle school art teacher.

Every child is an artist – the Problem is how to remain one once one grows up.  

Pablo Picasso

References
DEMOCRACY
## DEMOCRACY TIG

### Peace Education and Democracy: Overview

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Title of presentation</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astrid de Keizer</td>
<td>Hogeschool Leiden, NL</td>
<td>Peace and Liberty</td>
<td>Abstract</td>
</tr>
<tr>
<td>Jan Powels</td>
<td>Pabo Nijmegen, NL</td>
<td>The peaceful school Child participation peace and democracy</td>
<td>Abstract</td>
</tr>
<tr>
<td>Ulla Liberg and Erik Sigsgaard</td>
<td>Højvanseminariet, DK</td>
<td>Peace in the families predicts peace in day care and society. How and why?</td>
<td>Abstract</td>
</tr>
<tr>
<td>Thomas J. Fiala</td>
<td>Arkansas State Univ., US</td>
<td>John Dewey and Multicultural Education in a Global Society: Moral Principles and Pedagogical Practice in Peace Education</td>
<td>Paper</td>
</tr>
<tr>
<td>Bilan Duman</td>
<td>Mugla Univ., TR</td>
<td>The self-concept perception of freedom of multicultural literacy</td>
<td>Did not arrive</td>
</tr>
<tr>
<td>Britt Unni Wilhelmsen and Inga H. Andreassen</td>
<td>Høgskolen i Bergen, NO</td>
<td>Developing New Elective Programme for Junior High School Pupils</td>
<td>Paper</td>
</tr>
<tr>
<td>David M. Holman, Andrea Breckenridge and George Foldesy</td>
<td>Arkansas State Univ, US</td>
<td>Multi age classrooms: the whole is Greater than the Sum of the parts</td>
<td>Abstract</td>
</tr>
<tr>
<td>Annemarie Proost</td>
<td>Pabo Dordrech Hogeschool Rotterdam, NL</td>
<td>Peace Education in the NL With a focus on the Anne Frank organisation</td>
<td>Abstract</td>
</tr>
</tbody>
</table>

Sidsel Hadler-Olsen, TIG leader
Research on new elective program subjects for lower secondary school students
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Abstract
The objective of this paper is to present the first stage of research on the new Elective Program Subject (EPS) in Norway. The research objective is to assess how EPS elements are developed and implemented in Norwegian lower secondary schools 2007-2008 to achieve subject and pedagogical aims in the Norwegian National Curriculum (NNC). Participants in the study are teachers in lower secondary school on the west coast of Norway and university teachers at Bergen University College (BUC). The development of EPS elements is organized in seminar settings at BUC the academic year 2006-07 and autumn 2007. The EPS elements will be implemented at the schools the academic year 2007-08. Data to produce information from the study will be collected from written logs, interviews and observations. The research project will produce information to be utilized in competence building and continued quality work on EPS.

Background
In Norway compulsory education is for age 6-15, or 10 years long. This is divided into primary school and lower secondary school, and followed by optional upper secondary school. The upper secondary schools are separated units in the Norwegian education system. In this paper the focus is on the lower secondary level, where the students are 13-15 years old.

A new school subject
With the new reform of primary and secondary schools in Norway in 2006, entitled the Knowledge Promotion, the lower secondary schools will have a new compulsory subject for all students in autumn 2008. This new subject is Elective Program Subjects. Until the formal implementation in 2008, schools are encouraged to try out different models for the subject. But why should we make a new subject for school, and why is it this kind of subject? There is more than one reason, but we will focus on two of them.

Many national and international surveys over the last years have shown that the Norwegian students in lower secondary school are bored and many of them disturb the lessons with an unacceptable behaviour simply because of this. This element of disturbance seems to be more common in Norway than in most other countries in Europe. One of the explanations for this is that the students feel a lack of relevance in school. Another reason is that society needs appropriately qualified persons to the jobs in society to make the wheels go round. Before choosing education and occupation, the young people must know more about their options and the needs of the market. There are global changes in the occupational patterns in the world, with a shift from an industrial era and manufacturing jobs to an increase in service and sales jobs (Noddings, 2007). Students’ drop-out from upper secondary school is a considerable problem in Norway. Many students drop out of school or do not finish their secondary education because their choice of education program was not right for them or because they can not meet the demands of the study.

There are two main objectives of the new subject. One of them is to improve the differentiation of teaching according to each student’s interests and needs and to give them more opportunities to work with practical tasks. By this the hope is that the students will enjoy a more relevant and meaningful (as well as less boring) education better suited to individual interests and desires. The other objective is to facilitate the making of well-informed choices about their future education and work. By this it is expected that the students will make a decision in a harmony with their interests, hopes, abilities and the needs in the job market. This is to be done by letting the students work with contents, methods and tasks from education programs in upper secondary school, to “taste” and try out some parts of the study and work they are interested in.

So, with EPS the students will be given opportunities to work on issues considering their future and be prepared to participate in deliberative democracy by making well-informed choices. There are other objectives for the EPS as well, but on the society level. Among them we find more continuity between the two levels in secondary school, better career guidance and reducing drop-out rates in upper secondary school. There is also supposed to be more coherence between the students’ choice of education and occupations on one hand and the commerce and industry’s needs for recruitment on the other hand. All
this indicates that the lower secondary schools must cooperate with upper secondary schools and with the commerce and industry.

**Just enforced career guidance?**

Many schools in Norway that have started with EPS mostly focus on career guidance. They give the students an overview of the educational programs in upper secondary school and allow them to choose two or three of them to study closer; what it takes to get enrolled and what the job opportunities they can expect when they finish school. Then the students can visit workplaces or upper secondary schools that offer the educational programs in question and get more information about them. All this seems to be the easy part for most of the schools so far. This is what we call the *logistic-part* of the subject.

But this is just an enforced way of career guidance, and only part of what the subject is supposed to be. What is left is the main part, the teaching and learning, not only about the educational programs and job opportunities, but about the student himself and the labour market as well as the relations between them. *What do I want in my future, what are my options? Am I being realistic in my choice?* And so on. In trying to answer these questions, the students need assistance and guidance from grown-ups in school and outside school when reflecting about their options and finding out what they really want and how they can get there. This will be the *pedagogic-part* of the subject. So obviously EPS has two functions, the instrumental function and identity construction.

In this subject there lies a great opportunity for the school in encouraging the students learning engagement. “*If I try a little harder I will increase my possibilities.*” And the teachers can easily point out in what way some of the traditional school subjects are essential or important in their further education, and how they can use them in the future. Learning English in the program for health and social care is different than in the program for technical and industrial production or for general studies. The same can be said about mathematics, science and other traditional subjects. By giving the students opportunities to experience some of their school subjects related to the education programs they are interested in, they can gain more interest in the subject as well as getting to know more about the studies and demands in these education programs.

**The individual and society**

As mentioned, EPS is related both to the individual and the society. The intention is to give maximum benefit for each student and the society, and to support the students’ identity construction on micro, as well as macro level. Theories on identity construction show the relationship between these two levels and how they interact, with the self or self-identity on one hand, and group-belonging on the other hand (f.ex. Giddens, Beck, Fink, in Hovdenak 2004, Krange and Øia 2005). By learning to see himself and the opportunities in himself and in the community related to each other, the student can develop a deeper understanding about himself. He can reflect about his future and options in life and see himself as a part of a bigger picture.

In EPS the students are supposed to confront their wishes about future education and work to not only with their personal interests but also their abilities, the job market and the educations and occupations that are available. But is this possible with youngsters between 13 and 16? The aims for the subject are ambitious, both for the students as well as for the community. The subject is designed to support the solving and reducing of social and economic problems, either existing or expected.

*“When there are problems in the society, the problem-solving is handed over to the school.”*

This seems to be a world-wide strategy. Problems about students learning engagement, drop-out, recruitment etc. are supposed to be reduced, not completely solved by working with EPS. There will always be an uncertainty when making decisions about the future, but with EPS it is expected that some of this uncertainty can be eliminated. It would not be realistic to expect more.

When working with EPS, students get information about all education programs in upper secondary schools and what kind of jobs or further education they can lead to. Then they choose one of them and work on it for some time in different ways to get to know what kind of tasks they can expect, what methods are used, what the demands are and possibilities to get a job. After that they reflect whether this is a program they want to study or if there are any others they would like to learn more about. This part of their learning is extremely important, and they need a great deal of support in this reflection process to be
able to relate their different experiences to each other and to make their choices before going further on in the program or selecting another one.

**Some challenges**
EPS is a *progressive* subject, in contrast to *traditional* subjects like national or foreign languages, mathematics, science and history. Implementing a new subject in school would be rather easy if the subject existed in some form before the implementation, as for example with biology, philosophy or dance. But EPS is an entirely new subject, a new construction, based on experience and trials, not a complete subject yet. And when the Ministry of Education and Research wants schools to try out models and methods to use in the subject, without giving a subject curriculum, the tasks seem even more difficult. In EPS new partners for school, new learning communities, new contents and new methods are needed. There are great challenges in student assessment and there is also a challenge in the fact that the teachers who are supposed to form and implement EPS never have been students in this subject.

**Research on Elective Program Studies (REPS)**
The objective of research on EPS in Norway is to contribute with information on how EPS elements can be developed and implemented to achieve the content and pedagogical goals stated in the Norwegian National Curriculum (NNC). The research project will produce information to be utilized in competence building and continued quality work on EPS.

**Developing student competence for future election**
The new EPS in Norway can be interpreted to support the students’ personal growth and development. Researchers have assessed individual personal growth and development in an organismic and dialectic framework where the student is perceived to be an active growth oriented individual who seeks and engages in available opportunities in his or her environment (Deci and Ryan, 2002, p.8). The challenge for EPS is to develop the students’ individual or organismic framework through social environment or dialectic framework that promotes engagement for future competence.

The concept competence has over decades been integrated in psychological theories about personality and motivation, and motivation is valued as a condition for learning and competence development. The source to motivation is interpreted to be the student’s wish for effective competent interaction with his or her environment (White 1959). Motivation energy or *effectence motivation* is valued as a driving force for examining and mastering the environment. Effective engagement in EPS can develop an individual sense of strength to solve problems and enjoy being the source of solutions. The concept competence includes *competence* as an individual’s genuine skills and ability to effective interactions with the environment as well as an individual’s *sense of competence* as a subjective perception of own skills and ability to interact with the environment.

The sense of competence is closely linked to genuine competence as a product of own cumulative learning experiences (White 1972). The challenge for learning activities in EPS will be to develop learning environments that contribute to the development of individual competence by strengthening the individual’s perception of competence. In praxis, schools can vary the organization of learning situations, give response to physiological and emotional needs and support initiative from the students when they are working with elective learning activities.

Thus, the objective of REPS is to assess how EPS elements are developed and implemented in Norwegian lower secondary schools to achieve subject and pedagogical goals in NNC.

**Study design**

**Methods**
Qualitative data will be collected from written logs, interviews and observations the academic year 2007-08. The data will be used to produce information from the development and implementation stages of the REPS project.

**Participants and setting**
Participants in the REPS project at Bergen University College are teachers from four lower secondary schools in Bergen and Sund community and BUC teachers from the four subject areas natural science, social science, English and pedagogy.
**Development stage**
The development of EPS elements started January 2007

**Implementation stage**
Implementation of EPS elements will start autumn 2007.

**References**

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John Dewey and multicultural education in a global society:  
Moral and ethical principles that guide pedagogical practice in peace education  
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Introduction
The United Nations has declared that “Peace Education must be directed to the full development of the human personality and the strengthening of respect for human rights and fundamental themes (Peace, 2007).” Undoubtedly, a statement such as this is often stirring to individuals dedicated to democratic principles. This kind of statement also often elicits an effusive response from citizens of democracies throughout the world, as these citizens are united by ideals that are uplifting although often unexamined. For many, these words reach the most intimate recesses of the human soul and become universal principles that govern society. These words, however, are not benign because for some individuals, groups, and societies they can be dangerous since they challenge the fundamentals ideals of societies in which certain segments of that society maintain their dominance by means of inherent and often institutionalized structural inequality. Peace Education, therefore, can be a potential threat to certain types of societies and cultures that do not possess commonly agreed upon humanitarian ideals that act as bonds that link one individual to another or one society to another.

To be successful, Peace Education requires a unifying Weltgeist; a world spirit that must be part of each person’s self-consciousness. The Weltgeist upon which Peace Education is based, however, cannot be vague notions that only act as pacifiers for the status quo. Peace Education requires that individuals and societies make conscious and purposeful efforts to develop a theoretical perspective on fundamental moral and ethical principles that undergird the education process. Within the Weltgeist of Peace Education, however, the autonomy of cultures and states must also be allowed a significant degree of independence as long as the path the culture takes as an independent entity allows for universal peace. Without this type of theoretical perspective that acts as a kind of universal language between diverse individuals and cultures, communication between these individuals and cultures will be limited as will the creation of a world spirit that nurtures a Peace Education Curriculum.

The moral and ethical foundation of peace education
For nearly one hundred years, those individuals seeking to create a spiritually united common humanity have often turned to the ideas of John Dewey for guidance. Dewey’s notion of universal moral imperatives and conception of essential guiding moral and ethical principles can create an educational environment that helps begin to eliminate structural factors that adversely affect both individuals and the larger society. These factors include issues related to race, gender, ethnicity, religion, and social class. For some cultures, the danger of Dewey’s educational and social ideas will lie within his allegiance to democratic forms of governance, for it was democracy that acted as Dewey’s (1916) wellspring from which the common organic social whole found life. Democracy was the social orientation that he believed was necessary for society to function appropriately, and required that all citizens be given some sort of intellectual and moral key to their contemporary world. Peace Education to be effective also needs some type of proper social orientation and intellectual and moral key. Dewey’s (1946) philosophical insights can be that key that universally informs and invigorates a Peace Education Curriculum.

This key is a combination of intellectual thought and moral imperatives through which human rationality and ethical principles are brought into harmony forming a common spirit. Dewey (1914) reasoned that the creation of moral and ethical principles has been a manifestation of proper human interaction throughout history and is, in fact, an ongoing process. The beliefs and actions of individuals, cultural groups, and nation states have always been the result of approved ways of acting that are common to these entities. In Dewey’s mind, these beliefs also rest on the fundamental ideal that the animosity resulting from excessive egoism, whether political, religious, cultural, or individual be seriously and responsibly addressed, allowing those individuals and groups who have been historically marginalized an equal place in society.

Slattery and Rapp put it another way when they state that “pledges and patriotism [can] mask the global connectedness of all human persons (Slattery & Rapp, 2003, p.137).” But as Dewey (1914) explains, when each individual reaches a more harmonious state, then they begin to understand their individual responsibilities to other individuals within the social whole, and how each person needs freedom to realize their full potential. Thus both the individual and social whole begin to understand their essential rights and obligations to one another. This means that a sense of egalitarianism is an essential component
in the Weltgeist that encompasses all individuals. The goal, however, is not to make human drones that are held captive by this world spirit. Instead, the goal is a world spirit that allows for freedom, individuality, and harmony. By respecting individuality and difference, a more harmonious, peaceful, and fruitful coexistence can be maintained.

Dewey tells us that there are universal ethical rights that must guide society in order to meet the individual needs of each person. Individual rights, for example, include the right to “life and limb.” Simply put, this means that “safety, health, the right of free movement of the body, and being free from assault and battery” must all be part of each person’s normal daily existence. As Dewey makes clear, “Without this exemption, there is no security in life, no assurance; only a life of constant fear and uncertainty.” And most importantly, without this right there is “no chance of carrying ideas into effect.” For Dewey, this act alone is an important part of achieving true freedom. Furthermore, according to Dewey, all individuals must also have “security of life (Dewey, 1914, p. 442).” This then also becomes an essential component of a Peace Education Weltgeist. However, it is at this point that Dewey’s ideas can become potentially revolutionary to some individuals and cultures, for he demands that within a social context that assures a secure life “legalized slavery, serfdom, and the subjugation of the wife and child to the will of the husband and father must be eliminated (Dewey, 1914, p.443).”

Dewey (1914) also believes that the rights of workers to toil in safe conditions must be prevalent. In addition, individual rights include the right to mental activity. All this requires a world spirit that focuses on eliminating the conditions or factors that adversely affect the execution of purposes and wants of the individual, although always based on guiding moral and ethical principles upheld by the larger social whole. More specifically, the right to mental activity includes “freedom of thought and affection” which in turn requires liberty of “judgment and sympathy (Dewey, 1914, p.445).” The essential particular means to these broader opportunities are “free speech, freedom of communication and interaction, of public assemblies, liberty of the press and circulation of ideas, freedom of religious and intellectual conviction, of worship,” and to some extent the “right to education” which can help create a spirituality that nurtures individual freedom and social responsibility (Dewey, 1914, p.446).

Thus education can become a way to recognize and value the uniqueness of each person, and also a process to create a harmonic society in which the individual is given tools to attain freedom and rights based on universal ethical principles. A society in harmony with all its multifaceted parts, founded upon universal ethical principles, will be by nature a society in which all groups and individuals can peacefully co-exist. Peace Education, therefore, is a process that implants agreed upon universal ethical principles that spiritually unite all individuals and moves the individual to social action. This can potentially be dangerous to societies that find these types of ideals incompatible to the maintenance of alternative subjugating social arrangements. It is, however, these spiritual things in the form of individual rights and actions that will bring individuals, cultures, and nation states together for a common purpose such as Peace Education.

Multicultural education as a curriculum of peace
A multicultural approach to the learning process is a viable means to realizing Peace Education. Barbara Thayer-Bacon and Charles Bacon (1998) have pointed out the difficulties in creating a multicultural education curriculum in which democratic ideals clearly demonstrate what is “absolutely right” in all human endeavors and social arrangements. Of course, without some kind of agreement between diverse individuals and groups as to what issues will be focused upon, little benefit to them will likely occur. Nevertheless, as Thayer-Bacon and Bacon point out, first and foremost is for these diverse individuals and groups to develop communication skills centered around agreed upon social issues that universally affect all individuals and moves the individual to social action. This can potentially be dangerous to societies that find these types of ideals incompatible to the maintenance of alternative subjugating social arrangements. It is, however, these spiritual things in the form of individual rights and actions that will bring individuals, cultures, and nation states together for a common purpose such as Peace Education.

Using a multicultural curriculum, based on Dewey’s theoretical perspectives on moral and ethical principles, is a viable way to allow for vital communication in the development of a unifying Weltgeist. As a result of this educational approach, individuals are afforded both the skills and opportunities to communicate. However, to be most effective it is essential that in this educational process the “moral tone of absolutism” be removed. Instead, students must be allowed the opportunity to communicate ideas about important issues that drive the curriculum. The essence of this course of study is not necessarily one of self-righteous moralization, but rather an educational process that calls for continued re-examination and re-description that is part of a plan for continual social action and evolution that allows for structural
social change based on Dewey’s theoretical perspectives. An educational experience such as this is both transformational and action oriented (Campbell, 1996).

James and Cherry Banks, well known names in the area of multicultural education, clearly demonstrate the power of this curriculum to help realize the United Nations’ conception of Peace Education. For these two individuals, multicultural education is an “idea, a reform movement, and a process that goes about changing the structure of educational institutions (Banks & Banks, 1997, p.1).” This structural change focuses upon the factors that have stood in the way of affording equal opportunity. Within a multicultural curriculum the school itself is conceptualized as a social system and studied as this system relates to cultural identity and power relationships; the formal, informal, and hidden curriculum; and the attitudes and beliefs of all parties within the school community. Each of these variables are then studied and changed if necessary in order to realize success for all students (Banks & Banks, 1997).

The conception of a multicultural curriculum does recognize that the process of multicultural education will always need to be an ongoing process whose “ideals may not necessarily ever be fully achieved (Banks and Banks, 1997, p.4).” However, this is the very reason a multicultural curriculum needs to exist since it allows all parties to continually work toward the ideals that act as the foundation of this curriculum. Thus multicultural education and Peace Education can become synonymous since they both have as their educational goals an understanding of, and tolerance and respect for, those individuals that have been reduced in status as a result of societies that denigrate the position of individuals because of race, gender, class, religion or other cultural factors. This type of curriculum enables all parties to re-examine individual and group belief systems that have often led to violent conflicts. In this way the curriculum allows for an analysis and evaluation of whose interests are truly being served as a result of certain structural factors within society. Furthermore, this type of curriculum can begin to develop core ideals that are part of a more unified spirit.

By considering agreed upon themes within a multicultural or, indeed, a Peace Education Curriculum, students can begin to understand how they, along with others within a world community, actually have membership in multiple groups. They can then begin to understand that as individuals they are also part of nationalistic, religious, racial, ethnic, gendered, or social class groups, and that this membership makes for natural connections to others within society. As Irvine and York point out, “Knowledge of the characteristics of groups in which students belong, about the importance of each of these groups to them, and of the extent to which individuals have been socialized within each group will give the teacher important clues to student behavior (Irvine and York, 1995, p.485).” Understanding this behavior can give teachers and their students, insights into breaking down those belief systems and structural factors that have historically led to tensions and conflicts.

A multicultural approach to peace education in the classroom

As Eugene Garcia observes, “In our shrinking world, as the United States and other nations are pulled together by communications and economics, our diversity becomes more visible and harder to hide (Garcia, 1999, p.5).” The cultural diversity of students, however, is one of the greatest challenges presented to teachers, although this same challenge can be a marvelous opportunity to take a multicultural approach to education using innovative pedagogical approaches to help ensure individual learning success for all students, and understanding and tolerance of those who are different from oneself. A constructivist approach to learning is one pedagogical method that can be effectively used in a multicultural curriculum. Through this method of teaching, knowledge is constructed by the individual learner, certain cognitive structures are activated, and these structures are then continually developed. This cognitive action, in turn, allows for a transformation of existing cognitive structures which further allows the student to change. Learning then becomes an active process that has greater opportunity for success. According to Vygotsky, a child learns most effectively within certain zones of proximal development, when a child is best able to learn because of their developmental level (Garcia, 1999). And since our social experiences are inseparable from our thought processes and behavioral traits, a developmentally appropriate multicultural approach to education can break down those structural factors that become ingrained in the life experiences of students.

Christine Bennett (2006) succinctly synthesizes a multicultural approach to learning that is in line with the notion of Peace Education. Bennett declares,
Fair minded critical thinking is at the heart of Multicultural teaching. If teachers and their students are not continually engaged in critical thought, multicultural education is likely to result in indoctrination rather than ethical insights based on core values such as acceptance and appreciation of cultural diversity, respect for human dignity and universal human rights, responsibility to a world community, and reverence for the earth (Bennett, 2006, p.341).

Critical thought is therefore a means of reducing prejudice, evaluating and developing alternative perspectives, and taking responsible social action in one’s life. Critical thinking is a process that can break down structural factors that marginalize certain individuals and groups, and which have also led to violent confrontation throughout human history. In a constructivist educational environment that allows critical inquiry, students are engaged in complex issues and problem solving activities that are developmentally appropriate. The goal of this experience is to give insight into diverse cultures, and eliminate bias and prejudice that create tensions among individuals and cultural groups. Within this educational experience students construct their own personal knowledge base, a knowledge base that is now a synthesis of multiple perspectives that take students beyond their previously learned attitudes and perceptions of others (Paul 1993).

In particular, Bennett’s model allows teachers to begin to formulate a multicultural approach that will be in line with a Peace Education Curriculum. Within this model the teacher can begin the following:

A. **Global and Multicultural Values and Goals:** This is the wellspring of the entire educational experience. The teacher develops an understanding and appreciation of values that are part of Dewey’s theoretical perspectives on fundamental moral and ethical principles. Included in this endeavor is an understanding of the structural factors that are eliminated through multicultural education. Addressing these factors then naturally relates to a Peace Education Curriculum.

B. **Conception of Learner and His or Her Needs:** The teacher assesses individual learners based on both developmental characteristics, and very importantly, there cultural backgrounds. Findings are then evaluated as they relate to larger global values and goals (Weltgeist).

C. **Conception of Society and Its Needs:** The teacher is engaged in evaluating the society in which a child exists and begins to evaluate the needs of that society in relationship to larger global values and goals (Weltgeist).

D. **Statement of Educational Goals:** The teacher develops and clarifies specific educational goals that focus on eliminating structural factors that adversely affect society. According to Bennett, this would include:

1. Developing historical perspectives of the heritage and contribution of diverse cultural groups.
2. Strengthening cultural consciousness and intercultural competence in order to understand how individual cultural views differ and how different cultures communicate and function in different ways.
3. Combating structural factors that lead to inequality and violence. These factors include race, gender, ethnicity, religion, social class, and sexuality.
4. Awareness of the state of the planet and global dynamics that affect all individuals in a global community.
5. Developing social action skills including knowledge, attitudes, and behaviors needed to help resolve problems that threaten human life and peace (Bennett, 2006, p.329).

E. **Curriculum Planning and Instructional Design:** Teachers prepare lesson plans and determine effective means of instructional delivery. Examples of possible lesson plans abound on the Internet. Doing simple “Google” searches using words such as LESSON PLANS: discrimination racism, bias, equality, and democracy will provide teachers with ideas that relate to all grade levels.

**Conclusion: Creating Global Citizens for Peace**

Perhaps at no other time in human history has our global community faced so many complex challenges now threatening to alter life as we have known it. Civil strife in the form of religious sectarianism, political extremism, and ideological intransigence are plaguing every corner of the earth. No nation, city, town, village, or individual on earth is, to one degree or another, immune to cultural conflict and environmental destruction now so common on every continent. For all citizens of planet earth one question that should be asked is, “Can we produce an educated world citizenry that is able to act in concert in order to preserve the integrity of our world societies, maintain the proper physical
environments necessary for a quality life, and nurture the cultural atmosphere necessary for all people to be treated fairly in order to lead productive, profitable, and secure lives?"

While there is no single panacea that will eliminate the world’s multitudinous problems, an educated citizenry is an essential component in creating a unified front that can effectively begin to break down those structural factors that are often at the root of global conflict and stand in the way of global cooperation. It is the individual through the formation groups, cooperating with other individuals and groups, and finally acting in their unified and common interests that will have the power to make substantive changes to life on this planet. Through the efforts of national and most importantly, international associations, individuals can make a difference. One means to that difference is an educational initiative that unites diverse individuals and groups for a common purpose. This requires that these individuals and groups be united by a common spirit that can be part of every person’s educational experience. This spirit requires an understanding of problems that face all human beings, and requires that all human beings be given the opportunity to discuss commonly accepted problems and issues that stand in the way of creating a peaceful planet of tolerance and respect for diverse individuals and cultures. A Peace Education Curriculum taking a multicultural approach to education, based on John Dewey’s notion of universal moral and ethical imperatives, is one path that has the potential to make positive change occur. The classroom environment that will be created as a result of this curriculum has the potential to help achieve the goals of a Peace Education initiative; namely, the creation of students who have the knowledge, dispositions, and skills to manifest a society of tolerance, respect, and positive peaceful coexistence.

References
EARLY LEARNERS
This paper describes the organisation of an Early Childhood Network and participants’ use of action research and portfolio building to analyse, reflect on and share practice. It explores how this forum was created as a way to support practitioners in examining their own assumptions and values, to develop their practice and to document this process as reflective practitioners (Erault, 1994) in order to build towards a postgraduate qualification.

The EPPE project (Sylva et al, 2004) has been instrumental in driving recognition that the biggest factor determining the quality of childcare is the workforce; however literature and research on Continuing Professional Development continues to be focussed primarily on a school context. The crucial role of Early Years practitioners needs to be included in this debate. A hierarchy of values which places the learning and development of older students above that of three and four year olds has devalued the importance of the sector until recently. Although attitudes are beginning to change, this climate is still one in which the mutual support of fellow practitioners has a key role to play in validating beliefs and practices, reinforcing underlying philosophy and reaffirming the principles which underpin the early childhood tradition (Bruce, 2005).

The British government’s commitment to ensuring a graduate in every setting by the year 2010, associated with recognition of the status of Early Years Professionals, is a welcome move. Nonetheless a Continuing Professional Development (CPD) strategy, driven by a standards agenda and a commitment to school improvement, could be seen as another example of the division between education and early years care. Early Years is often viewed as not quite the same as ‘proper’ education. This paper explores how an Early Years Network can redress this imbalance by ensuring that practitioners in the sector who are not classroom teachers have the same range of opportunities to extend their professional knowledge and understanding.

Background context
The initial motivation for setting up the network arose as a result of the publication of Learning and Teaching: A Strategy for Professional Development (DfES, 2001) which laid out the government agenda for continuing professional development for teachers. A budget of £92m was identified with the intention that 700,000 teachers would benefit from this initiative. Within the University of Worcester, the Centre for Early Childhood was only one of the interest groups involved in setting up projects leading to postgraduate qualifications for practising teachers.

However, as a multidisciplinary field, it is never easy to locate Early Childhood, either as a subject within higher education institutions or indeed in terms of local authority governance (Neuman, 2005). Government funding for CPD was only available for recognised teachers and thus many Early Years practitioners from a wide range of different settings were not eligible. Nonetheless, three free modules available through this government initiative were an attraction that stimulated the initial development of the network.

Organisation of the network
The Early Years Network was set up to draw all those interested in early learners, regardless of the setting where they are based. The intention was to develop a learning community rather than follow a traditional model of transmission learning. It soon became evident that the usual pattern of post graduate provision would not be appropriate for our participants. Conditions of work differ widely amongst the wide variety of Early Years settings and there were a number of keen applicants who were certain that they could not attend weekly taught sessions. Thus a mixture of pedagogical belief and pragmatism informed planning from the beginning.

Network meetings take place on a regular monthly basis and include both planned ‘input’ and an opportunity to discuss students’ own work. Participants come from a wide range of different backgrounds and include nursery, reception and year 1 teachers, a playgroup leader, Children’s Centre leader and staff, lecturers from both Higher and Further Education, Local Authority Early Years Advisors, private nursery
managers and a child nutritionist, therefore input needs to be flexible and adaptable to everyone’s circumstances. A rolling programme of modules enables students to gain credit towards a Masters programme from whichever point they join the network. This ensures continuity within the group and encourages the sharing of good practice. Monthly meetings develop ideas about a variety of topics - for instance past meetings have considered Reggio Emilia, schemas and outdoor play - and readings support participants in further study over the next few weeks. In this way they can attend each meeting having had a real opportunity to consider the implications of differing approaches and concepts for their own workplace. Adaptable modules enable students to follow a specific focus and develop an overall theme in their studies, thus engaging in action research cycles (McNiff, 1992); two examples of this are literacy and transitions. The growth of technology also supports this model of learning, both formally by means of WebCT (an intranet virtual learning environment) and informally through email groups initiated by participants with similar interests and concerns.

The following table identifies the specific and distinctive features which differentiate this model of postgraduate provision:

<table>
<thead>
<tr>
<th>Traditional model</th>
<th>Network model</th>
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</thead>
<tbody>
<tr>
<td><strong>Mode of delivery</strong></td>
<td><strong>Network model</strong></td>
</tr>
<tr>
<td>Taught sessions on a weekly basis.</td>
<td>Monthly network meetings to include planned input plus discussion time</td>
</tr>
<tr>
<td>Teaching staff are likely to be attached to specific modules</td>
<td>Network leaders remain constant</td>
</tr>
<tr>
<td><strong>Content</strong></td>
<td></td>
</tr>
<tr>
<td>Narrow focus on one specific module</td>
<td>Broad focus to include all participants’ interests</td>
</tr>
<tr>
<td><strong>Participants</strong></td>
<td></td>
</tr>
<tr>
<td>Specific cohort studying each module.</td>
<td>Several different cohorts learning together.</td>
</tr>
<tr>
<td>Participants are likely to learn alongside different students when they move on to a new module</td>
<td>Group membership remains stable and consistent throughout students’ participation</td>
</tr>
<tr>
<td><strong>Mode of progression</strong></td>
<td></td>
</tr>
<tr>
<td>Students complete one module at a time from a range of choices</td>
<td>Students join the network at any point in a rolling programme</td>
</tr>
</tbody>
</table>

**Evaluation**
This programme is now in its fourth year. There are three main cohorts although some participants have joined the network part way through an academic year. The first group are currently writing dissertations but still attend the group on a regular basis. Evaluation of this programme comes from three primary data sources, namely ongoing evaluations done on a regular basis in order to monitor students’ experience, journals and reflective writing which support professional development and individual interviews. Five main themes emerge from evaluation of the network as a mode of study. The advantages of this approach can be identified as:

- a forum in which to explore issues and consider implications for practice
- increased knowledge and understanding (resulting in extended and/or improved practice)
- the opportunity to reassess values
- reinforcement of values
- support of the group through a learning community

**The opportunity to explore issues and consider implications for practice**
The major benefit of the network for all students is, not surprisingly, as a supportive environment in which participants discuss and debate issues of interest to them as practitioners. Those working in the Early Years are dedicated and committed to young children and the network is a forum in which this commitment can be pursued. Many participants have commented on the ‘authority’ postgraduate study gives to their ideas and suggestions in the workplace. For instance, a nursery manager who became a Children’s Centre leader shortly after joining commented that the network has:

*Given me confidence to question my practice and implement change backed up by theory and research.*

As a result of her involvement in the network, one Year 1 primary teacher was asked to give a presentation on learning through play to the teachers of the older classes and wrote in a reflective account:
I feel that although some colleagues will regard the use of the outdoors and the use of play as frivolous and to the detriment of formal lessons, I can now support my opinion and feel I have made an informed judgement as to the benefits of play and the outdoor environment with regard to children’s learning. Stone (1995, cited in Glascott, Burriss & Foulks Boyd, 2005:47) states that ‘To keep outdoor play in the schools where it exists and to return play to schools devoid of play will require courageous people to step forward.’

Beside this one of the tutors has commented - Be courageous!

**Increased knowledge and understanding, extending and improving practice**

Most of the participants in the network have been in practice for a number of years and so it is some time since they undertook any formal study. An opportunity to revisit theory and to relate new knowledge to their experience as practitioners is something which all find particularly rewarding. Because the flexible nature of the network allows everyone to adapt their study to their own particular situation, this does not only apply to those working directly with children. For instance, an Early Years Advisor comments that the network:

*Helped me to develop my practice by reflecting on my role in the process of helping others to develop and address specific issues too. My confidence has increased as a result of gaining a detailed knowledge of recent theory.*

In this way, good practice is spread wider than the immediate network and others working in the field also benefit.

**The opportunity to reassess values**

With the day to day demands of working with children it can be hard to step back and find the time and space to reconsider and question one’s own practice. When they first join the network, students are introduced to the use of a learning journal and portfolio. Portfolio building is familiar to most students nowadays but a learning journal is a new concept to many. However, once they begin to record their ideas, reactions and reflection, participants find these a really powerful tool to reinforce and chart their learning journey. Formal recording in this way (whether in a written diary, a file or in electronic form) enables them to think about ideas and values and to question everyday assumptions:

*[use of a learning journal] has charted development in my understanding and knowledge and revealed certain insecurities and self doubt, but also demonstrates increasing confidence as well.*

(Lindsay, Local Authority Early Years Advisor)

The increasing confidence identified here comes about as a result of opportunities for students to consider their value base and reassess the relationship between this and everyday practice.

*Whilst I know it is important in Key Stage 1 to incorporate play in the curriculum, I need to be able to justify this with evidence. Some of the research into how children learn best has made me reappraise my classroom management. I recognise that I must analyse and be more reflective upon my teaching on a regular basis, rather than concentrating on what has worked well or gone wrong during the day. I must look for a deeper and more objective understanding of teaching and learning within my classroom.*

(Laura, Y1 teacher)

**Reinforcement of values**

Ideally the work place should also function as a learning community (Brown et al, 2001) and support would come from work colleagues. However in practice not all participants feel that their values are shared, particularly within primary schools where the pressure of league tables and testing sometimes threatens to overwhelm teachers who attempt to maintain a play-based pedagogy (Moyles, 1994). One classroom teacher comments:

*Great to get together with likeminded people. Feel stronger to make changes in my own class. Encouraged me to undertake reading to support my beliefs.*

(Natalie, Y1 teacher)

In these circumstances, dialogue with others who share these same principles can do much to support practitioners who feel isolated in an unsupportive environment. A learning community which shares the
same values can reaffirm principles and provide reassurance that a child-centred ideology is not simply a romantic and unrealistic fantasy! As one nursery teacher commented: 

*I have discovered that I do not want to be part of a system that is simply preparing children for adulthood or part of a system that does not value the early years of a child’s life as a unique and very special time.*

**The development of a learning community**  
Early Childhood has always been an interdisciplinary, multiprofessional field; however, the recent drive to forge closer links between different professionals exemplified in *Every Child Matters* (DfES 2004) has focussed attention on the need to create strategies to foster these partnerships. A real strength of the network is the multiplicity of roles of those involved. Thus expertise comes from within the group itself rather than being tutor-led and thus helps to empower participants outside the confines of their studies:

*Because we all come from different backgrounds and share with one another, we learn and extend each other’s views, ideas and build on our learning.*

*(Keira, playgroup leader)*

Undertaking postgraduate work alongside a demanding and challenging job is not easy and the support of others has been a key factor in the success of the network. Since the beginning there have been two babies born (both of whom accompanied their mothers to meetings in their first weeks), as well as marriages, home relocations and new jobs. An additional consequence of the network has been to sustain morale and momentum beyond the requirements of coursework. Participants have visited each others workplaces and established meaningful working relationships between various settings:

*[The network] has given me enthusiasm – keeping me going when times are difficult. Feels almost achievable!*  

*(Sally, former nursery manager, now Children’s Centre leader)*

**Conclusions**  
The Early Childhood Network has evolved over time, developing in response to tutor evaluation and student feedback. The first cohort began on a module of self-assessment and action planning, therefore sessions revolved around discussion of practice. However, evaluation towards the end of the first year identified that students would appreciate some more formal ‘taught’ input to supplement this. Therefore there is now always a planned focus to serve as a stimulus to debate; this is frequently tutor-led but there are also many occasions when it is student-initiated.

A number of strengths and advantages result from this model of postgraduate provision when compared to traditional programmes:

- Responsive to the needs of students – the provision fits the needs of participants rather than the other way around.
- Develops from interests of participants – flexibility of modules allow individual interpretation thus ensuring that study is personally meaningful. There is an opportunity to follow through specific themes in a series of action research cycles.
- Development of a learning community that involves both tutors and students as equal partners.
- Multiprofessional networking that reinforces interdisciplinary learning and forges good working relationships.

As is the case with undergraduate provision, tutors’ pedagogy within the network stems from good Early Years practice. Thus the main principles underpinning the organisation of the network are that students actively construct their own knowledge (Piaget,1978), that this learning process is socially negotiated whereby higher mental functions are mediated through social interaction (Vygotsky,1978) and that learning is set within a meaningful context (Donaldson,1987). The significance of this approach to learning, regardless of the age or educational stage of the learner, emphasises the fact that learning is a lifelong enterprise.

The initial cohort of students, no longer involved in modules as they are engaged in researching for dissertations, continues to participate in the network. This ongoing involvement and loyalty to the group highlights its success as a learning community which empowers its members by enabling them to engage
in lifelong learning, enhance professional qualities, close the theory-practice gap and share knowledge (Chambers, 2001). The benefit of such a network supporting all Early Years professionals in becoming reflective practitioners is evident regardless of whether they are working in schools or other settings.

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The role of traditional/online educational games on the language teaching-learning process: a cognitive-constructive psycholinguistic perspective

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Introduction
This study adopts a cognitive-constructive psycholinguistic perspective and it is concerned with the important role of common traditional games such as lego, puzzle, and domino on its online and educational form on the teaching-learning process of mother and/or second language acquisition by the young learners on their early years (5-10) at school.

With this paper we explore a new educational application of Piaget’s theory of cognitive development known as constructivism and defended by Seymour Papert at the MIT in Cambridge, Massachusetts when applied to the teaching process through computer. Our perspective is a cognitive-constructive psycholinguistic one, because we want to analyse the importance of traditional and online games such as lego, puzzle and domino on the development of oral, reading and written language on young children. As psycholinguistics, we study the psychology of language, the psychological and neurobiological factors that enable humans to acquire, use, and understand language. We deal with the cognitive processes that make it possible to generate grammatical and meaningful sentences out of vocabulary and grammatical structures, as well as the processes that make it possible to understand utterances, words, text, etc. At developmental psycholinguistics, we analyse infants’ and children’s ability to learn language, usually with experimental or at least quantitative methods.

This study reflects a continuous observation of 5-10 children playing with several games, including the ones here presented, when visiting our Ludothece at our School of Education at Viana do Castelo, Portugal during activities of reading and writing included on projects to improve those skills or on pedagogical activities at primary schools where our students usually have their teaching-learning practice. This games were played on its traditional and online form and they were used on the learning of letters, shapes, vocabulary, the basic skills of oral and written languages.

Nowadays, particularly in Portugal, we psycholinguistics are pursuing this study as a science with a true multidisciplinary connected approach and of Applied Psycholinguistics in the Educational teaching-learning process, in the acquisition and development of oral language, bilingualism, in areas such as reading and writing as in the domain of disturbances on oral, reading, and writing processes. Psycholinguistics suggests that learners construct knowledge, as constructivism is a description of human cognition often related with pedagogic approaches that promote learning by doing. Here motivation to learn is strongly dependent on the learner’s confidence in his or her potential for learning. This links up with Vygotsky’s “zone of proximal development” (Vygotsky 1978) where learners are challenged within, yet slightly above their current level of development. By experiencing the successful completion of challenging tasks, pupils gain confidence and motivation to embark on more complex challenges.

Most teachers consider that it is possible to learn through play. Games form a part of the educational strategies used by educators at most levels of the school. Play does not take the same shape in informal contexts as in formal ones. Games are transformed when they are used for educational purposes: they are still games but they are used for a specific aim, to learn particular things, and to develop certain strategies and/or abilities.

Vygotsky (1978) also highlighted the convergence of the social and practical elements in learning by saying that the most significant moment in the course of intellectual development happens when speech and practical activity, two previously completely independent parts of development, converge. Through practice children construct meaning on an intrapersonal level, while speech connects this meaning with the interpersonal world shared by them and their culture.

A constructivist learning intervention is thus one where contextualised activities are used to give students an opportunity to find out and collaboratively construct meaning as the intervention unfolds. Teachers are respected as unique individuals, and instructors act as facilitators rather than as teachers. On pedagogies based on constructivism students learn by experimentation, and not by being told what will happen. They are left to make their own inferences, discoveries and conclusions. It also emphasizes that learning is not an "all or nothing” process, but that pupils learn the new information that is presented to them by building
upon knowledge that they already possess. It is therefore important that teachers constantly assess the knowledge their pupils have gained to make sure that their perceptions of the new knowledge are what the educator had intended. Teachers will find that since the pupils build upon already existing knowledge, when they are called upon to retrieve the new information, they may make mistakes.

Constructivist learning happens especially well when people are engaged in constructing a product, something external to themselves such as a tool, an album. Promoters of the use of computers in education see an increasing need for students to develop skills in Multimedia literacy in order to use these tools in constructivist learning. Actually, in all levels of education, the computer is an important tool on the teaching-learning process, and with that it increases the development of educational softwares. But the computer is also one of the main search tools, as it facilitates the access to information by internet, CDs, DVDs, and the like. So, the computer literacy should be improved near teachers and students. It is not sufficient to know and explore all the number of services and ressorts available trough the connection of the computer to the word wide web. It is also important to know the tool itself and use it daily.

Papert’s theory provided many central concepts in the field of developmental psychology and concerned the growth of intelligence, which for Piaget, meant the ability to more accurately represent the world, and perform logical operations on representations of concepts grounded in the world. The theory deals with the emergence and acquisition of schemata—schemes of how one perceives the world—in "developmental stages", times when children are acquiring new ways of mentally representing information. The theory is considered "constructivist", meaning that, unlike nativist theories (which see cognitive development as the unfolding of innate knowledge and abilities) or empiricist theories (which defend cognitive development as the gradual acquisition of knowledge through experience), it asserts that we build our cognitive abilities through self-motivated action in the world.

Virtual learning environments they offer many advantages: flexibility, distribution, and adaptability. However, there is another domain with tremendous potential for reaching, motivating, and fully involving learners: the world of games. We believe that games constitute the most interactive multimedia resource in our culture today. Nowadays, children gain access to the world of digital culture via digital games. Our main hypothesis is that children acquire digital literacy informally, through play, and that neither schools nor other educational institutions take sufficient account of this important aspect. We defend that multimedia design for training and education should combine the most powerful features of interactive multimedia design with the most effective principles of technologically-mediated learning.

Games can enhance the following functions:
1. motor development - games often involve movement; they stimulate precision, coordination of movements, and speed;
2. intellectual development - as well as movement, games may also involve understanding how things work, resolving problems, devising strategies, etc.;
3. affective development -the fictional nature of games, the opportunity to act out a role means that they have a key function in the affective development of the individual. Games stimulate students to understand their life experiences and help them to mature;
4. social development - games are also ways of relating to others; in addition to their socializing dimension, their capacity to symbolically generate roles makes them effective transmitters of society’s predominant values and attitudes.

We consider computer game to be an easy-to-use educational instrument with potential as backup to other teaching material. Computer games aid the development of strategies for reading three-dimensional images, they help to develop learning through observation and hypothesis-testing, they broaden the understanding of scientific simulations and they increase strategies for parallel attention. Some computer game will help develop any or all spatial skills. Computer game playing will only enhance a particular spatial skill if the game utilizes that skill. Another skill embodied in computer games is iconic or the ability to read images, such as pictures and diagrams. Indeed images are frequently more important than words in many computer games. Another skill incorporated in playing computer and video games is divided visual attention, the skill of keeping track of a lot of different things at the same time.

We are going to analyse the three types of games we choosed for this study. We will present them on its table version and educational adaptation and then allude them on its computer version. Also they will be
introduced according to its use by children on a diachronically perspective. So, first comes Lego as it is the first game played by most children, then we have puzzle and finally domino. For start, they will be analysed on its characteristics and origins. Finally, we end this study with the main objective of this study that is to analyse these games and its use according to the cognitive-constructive psycholinguistic perspective, emphasizing the mental and psychomotor capacities implied when playing them. This capacities are also used on the acquisition and development of speech, reading and writing. This kind of traditional table games are usually used to test a person’s knowledge, skill, patience, or temper and when adapted to the language teaching-learning process it explores contents such as letters, words, illustrations and vocabulary.

Lego are colourful interlocking plastic bricks and an accompanying array of gears, mini figures, and other pieces can be assembled and connected in myriad combinations, including houses, planes, and even working robots. As play is defined as a limited, structured and voluntary activity that involves the imaginary, it is an activity limited in time and space, structured by rules, conventions or agreements among the players, un-coerced by authority figures, and drawing on elements of fantasy and creative imagination. Lego defends the idea of constructionism based on Seymour Papert’s ideas, which he built according to his colleague Jean Piaget. Also in this game they defend imagination as while all share the basic idea that humans have a unique ability to “form images” or to “imagine” something, the variety of uses of the term “imagination” implies not one, but at least three meanings: to describe something, to create something, to challenge something. From the point of view of Lego Serious Play, it is the interplay between these three kinds of imagination that make up strategic imagination – the source of original strategies in companies.

At the beginning of the 21st century the LEGO brick was acclaimed “Toy of the Century” – first by Fortune Magazine and later by the British Association of Toy Retailers. Pre-school products are the category for children who haven’t yet started school. The products are specially developed to cater for the capabilities of the youngest children – encouraging them through creative play to use their hands and develop their motor skills. Today LEGO DUPLO comprises both loose bricks – encouraging the child to build entirely what comes into its mind – and play themes – for example, house, school and plain. The series is graded in difficulty for children aged 2-6 years. Safety and quality are key features of the Preschool range. The elements are large enough for children under three years to play with without swallowing them – and thanks to the way they have been moulded no bits can become loose.

On Lego Digital Designer an online game, children can built whatever they want and then if they send their construction to Lego company they can receive it at home. This kind of interaction permits a dialogue between the creator and Lego. The students create their play-environment with LEGO. We use LEGO duplo for the younger students and LEGO technic for the older ones. Operating with the small blocks lets to develop the movements of fingers, which is rather important for the schoolchildren. Teenagers work with ControlLab, making computer programs to control electro-mechanical Lego-models. The latter requires the real scientific abilities of the students, so they become those abilities by working. Creative work develops the cognitive and communicative abilities of children and teenagers. Each pupil is proud of his creation, he is glad to show it to his classmates, friends and parents. It is quite important for self-consideration and self-esteem and for self-education of the young person. It helps him to develop his personality harmoniously.

The program Micro Worlds helps teachers to develop the logical mind, attention and memory (which are in fact the main components of the learning ability) of their students. The important distinguishing feature of the teaching process for children is its emotional quality. The child remembers things, which are wonderful for him. So let’s make the world colorful and wonderful for our students. At school there is much theoretical information to be memorized. We can try to transform a considerable part of theoretical knowledge into visual and touchable form in order to make memorizing more creative and less passive. Learning by doing – it’s a good formula of Logo-philosophy, proposed by Seymour Papert.

Puzzle is an enigma that challenges ingenuity. Puzzles are often contrived as a form of entertainment, but they can also stem from serious mathematical or logistical problems.

Solutions to puzzles may require recognizing patterns and creating a particular order. People with a high inductive reasoning aptitude may be better at solving these puzzles than others. Puzzles based on the process of inquiry and discovery to complete may be solved faster by those with good deduction skills.
A jigsaw puzzle requires the assembly of numerous small, often oddly shaped, interlocking and tessellating pieces. Each piece has a small part of a picture on it; when complete, a jigsaw puzzle produces a complete picture. Jigsaw puzzles were originally a painted picture on a flat, rectangular piece of wood, and then cutting that picture into small pieces with a jigsaw, hence the name. John Spilsbury, a London mapmaker and engraver, is credited with commercialising jigsaw puzzles around 1760. There are also three-dimensional jigsaw puzzles. Many of these are made of wood or styrofoam and require the puzzle to be solved in a certain order; some pieces will not fit in if others are already in place. Also common are puzzle boxes: simple three-dimensional jigsaw puzzles with a small drawer or box in the center for storage.

Domino is a game played by children who understand the match between numbers. Dominoes (or "dominos") generally refers to the individual or collective gaming pieces making up a domino set. Standard domino sets consist of 28 pieces called bones, cards, tiles, stones, spinners or dominoes. Each bone is a rectangular tile with a line dividing its face into two square ends. Each end is marked with a number of black spots (also called pips) or is blank. The spots are generally arranged as they are on six-sided dice, but because there are also blank ends having no spots there are normally seven possible faces. The back side of a domino is generally plain. Dominoes have been made of bone, ivory, plastic, metal and wood, and occasionally are made of card stock like that for playing cards. Many different games can be played with a set of dominoes.

According to cognitive-constructive psycholinguistic perspective these three games have an important role on the development of psychological capacities involved on the acquisition and development of oral and written language. Dominoes are a fun way for children to learn the match between numbers, letters, words, words and images, to learn new vocabulary. For instance we have at the www Domino Pyjamas, a classic children’s learning game. The following tables sets the games and the development capacities inherent to each one and that can be more explored and increased with more practice of this games not only on its table form but also on its online one:
<table>
<thead>
<tr>
<th>CAPACITIES</th>
<th>GAMES</th>
<th>LEGO</th>
<th>PUZZLE</th>
<th>DOMINO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inductive or deductive reasoning</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>Matching dots (numbers), words</td>
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<td>(word-image, synonymous,</td>
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<td>antonymous and derivation of words)</td>
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<td>X</td>
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<tr>
<td>Creative development</td>
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<tr>
<td>Problem solving</td>
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<td>Team working skills</td>
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<td>Learning by making</td>
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<tr>
<td>Role-play</td>
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<td>X</td>
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<td>Whole-part relationship</td>
<td></td>
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<td></td>
<td>X</td>
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<tr>
<td>Imagination</td>
<td></td>
<td>X</td>
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<td>Recognizing patterns, shapes, sizes</td>
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<td>and colours</td>
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<td>Social and skill development</td>
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<td>X</td>
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<tr>
<td>Physical development (fine motor</td>
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<td>control using the pieces of the game</td>
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<td>or a mouse for navigation)</td>
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<tr>
<td>Iconic development (ability to read</td>
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<td>images)</td>
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As a conclusion, we expect that this study brings to discussion the importance of play, as a motivation to the learning process of oral and written languages, mainly by 5-10 children. This paper is the beginning of a reflection on the importance of traditional games in general, and lego, puzzle or domino in particular, and its use on educational or computational learning. We hope that this small contribution will work as a mobile to further investigations on this vast learning domain.

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Children learn by means of the scientific thinking circle
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Scientific thinking and problem solving
‘Scientific thinking’ is a certain kind of attitude, a way of thinking about and dealing with the world around us in an attempt to understand it better. This attitude, this innate human amazement and curiosity, leads us to the answers to research questions by sensorial experience, by trial and error, by experimenting. One normally distinguishes four principles in this specific thinking characteristic. First, there is a theory, which is a set of hypotheses, convictions and conclusions that relate to the world one is living in. Secondly, there is the environment, in which processes and environmental features are present. Thirdly, the theories are used to make predictions. Finally, the data, coming from experiments and observations, will again be related to the theory. The literature on developmental psychology which deals with scientific thinking makes a distinction between two paradigms. The first paradigm focuses primarily on the development of what children know about natural phenomena as they occur in biology, astronomy or physics (Aguiar & Baillargeon, 2003; Baillargeon 2004a, 2004b, Dejonckheere, Smitsman, & Verhofstadt-Denève, 2006; Dejonckheere, Smitsman, & Verhofstadt-Denève, 2005; Havu-Nuutinen, 2005; Miller & Bartsch, 1997; Spelke, 1998; Vosniadou & Brewer, 1992). The second paradigm concentrates on the development of problem solving as scientific thinking (Gorman, 1989; Klaiman & Ha, 1987; Koerber, Sodian, Thoermer, & Nett, 2005; Kuhn 2000; Ruffman, Perner, Olson, & Doherty, 1993). However, it remains unclear what exactly should be understood when the term ‘scientific thinking’ is used. Zimmerman (2000) sees scientific thinking as the ability to coordinate a number of cognitive skills such as using heuristics, reasoning inductively and deductively, problem solving, etc. Klahr and Dunbar (1988) state scientific thinking to be equal to problem solving which aims at looking for information so as to form a hypothesis that can fit certain observations. Kuhn (2002) claims that scientific thinking is a skill where one can obtain hypotheses and data through integrating and differentiating observations and can get data obtained from experiments. Apparently it is fundamental to test and research hypotheses within the development of scientific thinking. It forms a part of a larger cognitive skill: problem solving.

At first, preadolescent children were thought to have difficulties with scientific thinking, especially when the result of the observation did not correspond to what the child had previously thought (e.g. Inhelder & Piaget, 1958; Kuhn, Amsel, & O’Laughlin, 1988; Tschirgi, 1980). However, it now seems more plausible that even pre-schoolers have certain skills of scientific thinking. Numerous learning-psychological theories have shown that children acquire knowledge and skills by heuristics (De Block, 1995). Problem solving strategies and heuristic methods are systematic searching strategies that may help to untangle the problematic character of a task and may therefore enhance the chance of finding a solution. However, heuristics do not offer a 100 per cent guarantee to find a correct solution and differ in this from algorithms (like for instance the long division algorithm). Heuristics make a strategic and systematic approach of a problem possible, in contradiction to passively awaiting a solution or to an approach based upon wild guessing (Verschaffel, 2000).

Scientific thinking and self instruction
Within psychological literature, we categorise the functions that are important to 1) quickly and accurately choose a solving strategy for a specific problem, to 2) suppress erroneous reactions, to 3) execute the strategy and to 4) evaluate the result of the process, under the term of executive functions. In other words, executive functions play a role as far as planning, impulse control and decision behaviour are concerned. It is remarkable to observe that language influences the quality of these executive functions. This observation however is not new, as Vygotsky (1986) had already remarked children use external egocentric speech to assist reasoning, acting and planned behaviour: language supports action. Also Miyake, Emerson, Padilla en Ahn (2004) indicate that internal speech is heavily implicated in evoking and reactivating relevant task goals/tasks from the long term memory and that internal speech serves as a self regulatory instrument that indicates what the next task is and how it should be tackled.

To this, one can relate the question whether executive functions can be improved by means of instruction. Research within this paradigm appears to confirm this. For instance, Perels, Gürtler and Schmizt (2005) examined to what extent training of self-regulation and problem solving strategies give cause for better performance on mathematical tests. The results proved that by putting the stress on self-monitoring processes like mediation combined with the teaching of problem solving skills, the problem solving
performance increased in contrast with children who did not profit from such tuition. They also found that the time the children needed to solve more complex problems decreased. These authors therefore conclude that instruction, aimed at problem solving and directing the attention on one’s own mental actions, is the most efficient way to support problem solving skills. Moreover, one expects these effects to be transferable to other, more difficult domains of knowledge than those used in the experiment. To summarise, one can state that self regulation, verbalisation of a problem and verbal support of the action process improve the executive functions in problem solving. Furthermore, one can say that teaching these cognitive strategies supports the executive functions.

One cognitive strategy we want to highlight here is ‘self instruction’. Self instruction occurs when an individual instructs himself to do something and subsequently effectively does it. The instruction, therefore, does not come from the teacher, but from the learner himself. Teaching self instruction means offering a heuristic and supporting the learner while he is executing a task by himself. Self instruction supports the executive functions needed for problem solving, as it forces the individual to think in phases and in steps. Verbalising thoughts may give cause for more systematic thought and for taking care of erroneous trains of thought before the process of problem solving turns out wrong. This method leads to phased thinking and verbalisation of thought. The methodology for self instruction was first formulated by Meichenbaum and Goodman (1971) and Meichenbaum (1979), where the mental and motoric actions are directed with the aid of four picture cards on which four bears are printed. Each card has one standard sentence printed on it, which gives the child the necessary support to reflect on situations and which improves the child’s self control. These standard sentences are:

1. “What do I have to do?” and “What is the problem?”
2. “How am I going to solve this problem?”
3. “I execute” or “I follow my plan”
4. “I check and formulate a conclusion”

We can conclude that putting the process into words obviously means more than these four little sentences. The child will learn how to put the totality of his thinking into words. Language is already a way of structuring thoughts: one simply cannot say two things at the same time. If the teacher speaks with the child, it gives him/her the opportunity to follow the child’s thinking process, to track down possible mistakes and to interpret them more correctly. Each phase is not only supported by language, but also by drawings. The ultimate goal is that the pupil can give himself certain instructions to control his/her behaviour, his/her thoughts and can integrate in this way a number of essential thinking and problems solving skills.

Scientific thinking is a specific form of problem solving. Scientific thinking also calls on the executive functions as the child needs to form a new action plan over time to test his/her hypotheses. In contrast with previous views on when scientific thinking is possible, one is now convinced of the fact that scientific thinking is already present from early babyhood (before the cognitive aspect) or already with pre-schoolers (before the problem solving aspect). Since selfinstruction, which focuses on problem solving and on putting the stress on one’s own mental actions, has an effect on the quality of the process of problem solving, one can expect that selfinstruction also has an effect on scientific thinking.

**The scientific thinking circle**

In what follows, we describe the different steps of the heuristic for scientific thinking (Gatt, 2003) in connection with a self instruction strategy (Meichenbaum and Goodman, 1971). Solving scientific problems asks for an active application of strategies (heuristics). It is important that the child consciously knows he is using these solving strategies. By focusing on earlier made tasks in the initial phase of the scientific thinking circle, one can improve the call for the strategy needed. Consequently, it is necessary to point the heuristic out to the children, and to encourage them to use it.

1. **Orientation phase**

In this phase, children are confronted with a scientific problem. Spontaneously, they will start to muddle along. Children now need to be given the opportunity to express their first impressions and to tell to the class what they already know about the subject. In this way they develop a natural motivation for the subject and this muddling along spontaneously digs up knowledge and skills already present. The children are now challenged to express their own ideas concerning a certain subject and get confronted with possible misconceptions through interaction with fellow pupils. In this phase, the teacher does not offer answers nor confirmations of correct or erroneous thinking. The problem is or the questions are deducted...
from what children are saying: What exactly is the problem? What do we have to do? What do we want to know? How does this fit together?

The goal of this first step is to clarify the task or problem. The situation is thoroughly explored with all the children and we get to a definition of the problem. In this way, this forms the preparation of the other steps, not only as it is a prerequisite for solving the problem, but also as it is a necessary means of evaluation when we reach our goal at the end. The word “stop” in the drawing emphasises the fact that the natural impulsiveness of the child should be slowed down, and that they must spend some time to think about the problem. By using a verbal support – ‘What do I have to do?’ or ‘What is the problem?’ – the child suppresses his or her impulsive need to immediately start the execution. We teach the child the habit of exploration whenever a new given occurs. It is very important that the child feels that every answer is ok in this phase. By learning children to explore, you fulfil the first target of the first step: ‘What am I expected to do?’ Do not hesitate to ask the child for the possible goal of the exploration and what could go wrong if such an exploration was not present. They will come up with answers such as the following: ‘we have to explore so as to know what to do,’ One child’s answer functions as an inspiration for other children’s thoughts and together they will achieve the ultimate goal of the exploration. You can strengthen the transfer by asking them to formulate an example of the class situation in which they ‘explored’ and what this was good for (Timmerman, 2003). With this step, you teach the child to integrate a task and its instruction more thoroughly. This goes much further than merely asking for a brief answer to the question: ‘what do I have to do?’

2. Explorational phase
At this stage children have the opportunity to spell out their ideas and beliefs about the scientific problem tackled. During this stage they analyse the problem and they think about what the solution could be and how to deal with it. They place different theories and possible solution methods next to each other, put it all into words and think aloud. It is important to get the children to spell out what they think such that they can become aware of their own ideas about the phenomena discussed. By using a verbal support – What do you think will happen? (prediction) and Why do you think this will happen? (hypothesis) the teacher will be informed about the range of ideas that the children have, and which need to be tackled later in the restructuring phase (Gatt, 2003). A prediction is related to what you think is going to happen when executing a certain experiment to solve the problem. A hypothesis looks for a certain kind of obviousness. So it explains a certain prediction. Hypotheses are temporary and may change or can be adapted. One must be able to test hypotheses. We can formulate new hypotheses when the results do not meet the predictions made. If the hypothesis does agree with the predictions made, it is called a theory.

In this phase, pupils will sometimes have to plan one or more experiments. Sometimes it is possible to work out an experiment from knowledge that is already present with the children. Perhaps, children can also think of different plans to solve the problem. Children may not forget to think about how the execution is going to be steered. Experienced planners may be able to foresee what can go wrong or look for whatever auxiliary means may be necessary.

3. Executive phase
The learning conversations with the teacher and the value of the interaction between the children and the teacher mainly happen within the first two phases. These take care of an efficient execution of the third phase, the executive phase. By using a verbal support ‘we carry out the task’ (the experiment or the plan), the children do research and seek for the answers to their own questions. If they find satisfying answers or results, they record these. This drawing or written recording is necessary in the thinking process of children, as it is a way to test and substantiate predictions and hypotheses.

In this phase, children execute the steps one by one. During the execution, it may often happen that they have to adapt the plan (phase 2), or that they have to analyse the situation further (phase 1) to get a more adequate description of the problem. The need for flexibility comes in this step on the fore.

4. Restructuring phase
This phase is supported by the verbal phrases: ‘Was our prediction and hypothesis correct?’ – ‘What can we conclude?’ Children have only really learnt something when they evaluate the result together. Mostly, they remain too general when formulating a conclusion. The child has to take up the habit of looking at the predictions and the hypotheses again so as to check if the result of the experiments concurs with them or not and why this is (not) so. The child must learn how to judge himself in a critical way.
When executing experimental activities, we find that children already have a lot of (scientific) baggage, which however consists, most of the time, of fragmented and compartmented knowledge. We call this knowledge “alternative pupil notions”, “misconceptions” or “natural thinking”. Everybody has this kind of erroneous notions. They mostly result from the fact that children still find sciences illogical. So, in this phase, the children compare predictions and hypotheses (see phase 2) to the results. This is the very core of the constructive scheme. Now pupils exchange new ideas and run into misconceptions. It is only through solving those misconceptions that ideas can be reconstructed. This reconstruction however only takes place if pupils also experience that certain perceptions or ideas are erroneous. It is a teacher’s job to assist children in reflecting upon their results, and must be careful to avoid giving the correct answer. The children must get the possibility to find a solution to the reconstruction of their original ideas themselves. If children are aware of their own change of conception, it is more likely that it will be held permanently. So metacognition is used at this stage. It empowers the children not only to become aware of their learning process but also to be in control of it. (Gatt, 2003)

In this phase, it is also necessary to reflect on the ‘problem solving’ process (the scientific thinking circle): did the plan or experiment eventually turn out right? Did the plan or experiment contribute to finding a solution to the problem? Could we do it more quickly next time? Was the plan executed correctly and adequately? We cannot limit ourselves to merely checking upon the result. So, we also have to evaluate the process; “If we have to do a similar task again, how will we tackle it? What have we learnt from this task?” They must ask themselves the question: what did I learn from the situation that I can use next time?

5. Transfer
If knowledge has been built up, the children must be able to transfer this knowledge to other situations. They need to practise using the concept. This is achieved through applying their newly constructed ideas to a variety of situations. This exercise promotes the assimilation of the ideas learnt. This means they shall have to step out of the context of here and now. If children are capable of applying the newly acquired ideas to a variety of situations, it would then be easier to make the reasoning on their own (Gatt, 2003)

It may be helpful to visualise often recurring mistakes to check them, so that they can be used as a guide in self control. During the execution of the scientific thinking circle, the child will regularly show that he finds he has made a mistake. The assistant can use these moments to teach the child by mediation how to get on the right track again. Some children do not know very well what to do when they have made a mistake and see their way of thinking as wrong. They do not find a new way by themselves. When they are working as a group, however, they will be actively searching for new options. The phases of the scientific thinking circle follow each other logically, but cannot however be strictly separated. Often, we reach back to an earlier phase to get further into the examination. This way, there is a constant interaction between the different phases.

Conclusion
There are many publications that explore to what extent specific instruction processes influence the way of thinking and acting (executive functions) in problem solving. Most of the instructional methods within this frame are based on research made by Meichenbaum and Goodman (1971). Scientific thinking is a specific form of problem solving. Scientific thinking also calls on the executive functions, as a child has to be able to make an action plan as regards the testing of hypotheses over time. As self instruction focuses on problem solving and as directing the attention to one’s own mental actions has an effect on the quality of the process of problem solving, one can easily expect self instruction to have an important effect on scientific thinking. The formulated methodology combines the scientific thinking process with self instruction so as to reach a solution for scientific problems. The ultimate goal of the postulated methodology is that the child learns how to solve a problem independently and that he can evaluate himself. The child has to have the necessary thinking steps and check-up questions to steer and evaluate his/her own actions. He needs to have an insight into possible hurdles and dedicate some special attention to those hurdles. When using this methodology, the child will acquire the necessary thinking- and problem solving skills.

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Socrates – comenius 2.1 project - 226373-CP-1-2005-1-BE-comenius-C21 (STIPPS) The implementation of the Scientific Thinking process in (Pre) Primary School settings
INSTRUCTIONAL TECHNOLOGY
AND
LEARNING
Computing skills among educators
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Introduction
Several earlier studies (Harel 1990, Harel & Papert 1991, Kulik 1994, Baker, Gearhart & Herman 1994, Scardamalia & Bereiter 1996, Sivin-Kachala 1998, Wenglinsky 1998, Mann et al. 1999) showed that students with access to teachers who received professional development on computers, demonstrated positive gains in achievement on researcher-constructed, standardized, and national tests. Henriquez & Riconscente (1999; see also Atallah & Dada, 2006) reported that teachers who participated in training programs on the use of laptop computers noted positive change in their students’ abilities and work habits. Substantial changes in teachers’ professional practices were also found, including teachers becoming more reflective about their teaching practices, spending more time advising their students, and spending more time working with other teachers. Also Davis (2000) urged that teachers need comfortable access to and preparation for effective deployment of information technology (IT) in education in schools, colleges, communities, and teacher education programs.

In Finland the government has chosen the information society as the theme of one its policy programmes. The aim is to promote information society development by enhancing cooperation between various partners, by developing citizens' information society skills, ensuring access for people to fast connections, promoting the availability of educated and trained labour, and by utilisation of ICT in public services and administration (Finnish Ministry of Education, 2004).

Among other countries, multiple strategy papers for applying ICT in education have been released in Finland. In the everyday life of educators this should mean that ICT is used extensively in studies and teaching at all levels of education. Basic education should provide initial grounding for ICT skills. These skills are deepened at the secondary level, and the higher-education level. Recently the Finnish “National Knowledge Society Strategy for 2007-2015”, calls for a well-designed infrastructure including fast network connections, lifelong learning, working copyright mechanism, and international cooperation (Information Society Programme, 2006). In modern teacher training, good overall and pedagogical ICT skills are required to train forward-looking teachers and to renew instructional methodology. Care should be taken to provide teacher trainees with sufficient knowledge and skills for utilising ICT and electronic materials in education and in school-home interactions. The aim is that in Finland by 2007, no less than 75% of teachers will have the knowledge and skills to use ICT in teaching.

Background
When investing in educational technology, policymakers are certainly looking forward to some payback for that investment. Prior research has documented that technology can support the learning of an individual student by structuring inquiry activities, providing tools for recordkeeping, highlighting essential phases of the process, and guiding metacognitive and reflective activity (Pea, 1993). There is also evidence indicating that technological tools can also enhance students’ conceptual understanding by providing tools for organising, representing, and visualising knowledge (Salovaara, 2005; see also Pea et al., 1999; Rochelle & Pea, 1999). These higher-level knowledge-construction processes are, nevertheless, invoked only if people, staff and students have skills and willingness to engage in utilizing the potential of ICT in education.

According to Williams, Coles, Richardson, Wilson & Tyson (2000), teachers’ ICT development needs can be categorised into access to ICT, appropriate training and ongoing support to encourage progression beyond initial teacher education or training. In their study 57% of primary teachers (n=1480) and 61% of secondary teachers (n=1314) expressed a need for more technical skills and knowledge. Only 5% of primary teachers and 4% of secondary teachers expressed a need for teaching ICT skills. Sinko and Lehtinen (1999) perceived a gender difference in the self-evaluations of university teachers and students on their own information technology skills. Among both students and teachers, males tend to say they have better skills in the use of information technology than females. They also discovered that both teachers and students have a relatively good mastery of the basic skills of using information technology (word processing, email, operating systems, web browsing).
The Study
This study was conducted in Finland at the University of Oulu, Faculty of Education, Department of Educational Sciences and Teacher Education. The Department has approximately 1300 lower or higher academic degree or postgraduate degree seeking students. Annual enrolment figures of students for 2006, categorized by different programmes, are as follows: Educational Science 30, Teacher Education 40, Master of Education / International Teacher Education 20, Technology Oriented Teacher Education 20, Early Childhood Education 20 and Music Education 18. In addition, approximately 150 students from outside the department are taken in annually to complete studies in pedagogics. The Department has approximately 130 staff members of which 17 are professors, 9 senior assistants, 11 assistants, 31 lecturers, and 14 other teaching staff. There are also about 20 researchers. The rest of the remaining staff belongs to administration. In this study all staff members are treated as teacher trainers, regardless of someone’s specific job or position – diverse and versatile know-how is needed to train modern teachers. That also means that every staff member has a disparate background: all are professionals and experts in their own subject matter, but only a few of them have studied computing science or related subjects. However most of the staff members have participated in at least some short ICT courses, and some have studied educational technology as a minor subject.

Research Questions
The following three research questions guided the study:

What is the common level of computing skills among the staff and first year students of Department of Educational Sciences and Teacher Education?
1. How do the computing skills of staff and students compare?
2. How do other factors (gender, age) interact with computing skills?

Answers to these research questions should have implications for current teacher training in a context of recruiting staff and students, and their further training. To address these questions a survey was utilized among staff members and students.

Data Collection and Instrument Description
In September 2006 data were collected among the Department staff and first-year students. A multiple-choice questionnaire were mailed to each staff member (N=130) to which they were to respond anonymously. Seventy-two (55.4%) of staff questionnaires were returned. The same questionnaire was delivered to students (N=148) and 117 questionnaires (79.1%) of those were returned.

The questionnaire was divided into three parts:

Background Information: Affiliated professional group, gender, age, ownership of personal computer with Internet connection, and average weekly computer use.
Practical Computing Skills: Operating system, word processing, spreadsheet, presentation software, email, Internet (information seek, webpage design, music and video downloading, Internet phone calls, videoconferencing), digital image editing, digital sound, virus protection and firewalls, and web-based learning environments.
Experiences and Attitudes Towards Applying ICT at Schools: Students versus staff in computing skills, origin of computing skills gained, and computing as a hobby.

Respondents were asked to describe the level of their computing skills by selecting one of the five choices in a Likert-style assessment as follows, from “I can do that easily” to “I can’t do that”. 189 questionnaires were received: 38.1% from staff, 61.9% from students; and .132 (69.8%) from females, with 57 (30.2%) from males. The analysis involved both descriptive statistics and two independent-samples t-tests.

Findings
Background Findings
At work or study, 186 (98.4%) of respondents had access to a personal computer. A home computer was owned by 168 (88.9%) of the respondents (91.7% of staff and 87.2% of students). The computer was connected to Internet in 97.8% of cases at work or study. At home 81.0% of the respondents had an Internet connection (84.7% of staff and 78.6% of students). One staff member was not sure about Internet access from home. Respondents reportedly use their computers 15.3 hours in a week on average, with a median of 10.0 hours. Staff members reported substantially higher weekly usage levels at 28.2 hours,
compared to 7.5 hours among students (t-test, ***p<.001). Females reportedly significantly lower levels of computer use at 12.6 hours in a week (staff 27.8 hours, students 6.4 hours), compared to male reports of 21.2 hours (staff 28.8 hours, students 11.5 hours). This statistically significant difference (t-test, ***p<.001) confirms Kumpulainen’s (2006) earlier finding: first-year male teachers student reported an average of 11.9 hours per week with the computer, compared to 6.6 hours per week for females.

Common Level of Computing Skills
Computing Competence Profile (CCP) was figured to describe the common level of computing skills. In this study the CCP consists of nine factors, and each factor refers to 2-9 (A-I) items (variables) in the questionnaire. The CCP factors and included items included the following:

Operating System (Windows). I can install and update Windows operating system.
Word processing. I can edit, format, save, open and print text. I can create an automated table of contents.
Spreadsheet Software. I can create simple formulas. I can illustrate tables with graphs.
Presentation software. I can create PowerPoint presentations by using links and interactive buttons.
Email. I can create and update mailing lists.
Internet Usage. I can create bookmarks in my browser. I can build websites by using html. I can use the Internet for phone-calls. I can use computer-based videoconferencing.
Digital Image. I can scan images and move my images to a computer.
Digital Sound. I can run mp3 files via computer. I can edit .wav files.
Data Protection. I can avoid viruses in email. I can install and update a firewall on my computer.

Table 1 describes the CCP scores of staff and students: ‘the common level of computing skills among the staff and first year students.’

<table>
<thead>
<tr>
<th>Item</th>
<th>Staff (N=72) Mean</th>
<th>Std. Deviation</th>
<th>Significance of difference (p)</th>
<th>Students (N=117) Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>2.34</td>
<td>1.28</td>
<td>.028  *</td>
<td>2.75</td>
<td>1.22</td>
</tr>
<tr>
<td>Word Processing</td>
<td>2.18</td>
<td>1.03</td>
<td>.000  ***</td>
<td>2.72</td>
<td>0.95</td>
</tr>
<tr>
<td>Spreadsheet Software</td>
<td>2.38</td>
<td>1.25</td>
<td>.000  ***</td>
<td>3.39</td>
<td>1.34</td>
</tr>
<tr>
<td>Presentation Software</td>
<td>2.53</td>
<td>1.28</td>
<td>.000  ***</td>
<td>3.51</td>
<td>1.32</td>
</tr>
<tr>
<td>Email</td>
<td>1.46</td>
<td>0.67</td>
<td>.000  ***</td>
<td>2.00</td>
<td>0.81</td>
</tr>
<tr>
<td>Internet Usage</td>
<td>3.14</td>
<td>1.19</td>
<td>.003  **</td>
<td>3.63</td>
<td>0.99</td>
</tr>
<tr>
<td>Digital Image</td>
<td>2.65</td>
<td>1.43</td>
<td>.179</td>
<td>2.91</td>
<td>1.24</td>
</tr>
<tr>
<td>Digital Sound</td>
<td>3.39</td>
<td>1.55</td>
<td>.235</td>
<td>3.63</td>
<td>1.24</td>
</tr>
<tr>
<td>Data Protection</td>
<td>2.81</td>
<td>1.44</td>
<td>.691</td>
<td>2.89</td>
<td>1.37</td>
</tr>
</tbody>
</table>

Note: * p<.05, ** p<.01, *** p<.001

Table 1 also shows that the staff scores higher in every single CCP factor compared to students. In four factors out of nine (word processing, spreadsheet, presentation software, and email) the observed difference is statistically highly significant (t-test, ***p<.001). The difference between the skills of staff and students are minor for digital image, digital sound, and especially for data protection. Figure 2 illustrates the data that is presented in Table 2.

The profile of computing skills demonstrates clearly the similarities and differences between the staff and students. Among the measured skills, proficiency in emailing was common across the board. By contrast, the scores in digital sound and Internet usage were relatively low in both groups. Group differences were particularly noted in using spreadsheet and presentation software. Comparative analysis yielded evidence of wide diversity. Thus, other factors must be examined in attempt to understand the results. That analysis will be produced by answering the next research question.

How do Gender and Age Interact with Computing Skills
To examine the relationship between gender and computing skills, CCP-scores were calculated separately for male and female respondents (see Table 2).
Table 2: CCP, males v. females

<table>
<thead>
<tr>
<th>Item</th>
<th>Staff (Male)</th>
<th>Female</th>
<th>Staff (Male)</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System (Windows)</td>
<td>1.75</td>
<td>.000  **</td>
<td>2.82</td>
<td>1.92</td>
</tr>
<tr>
<td>Word Processing</td>
<td>1.81</td>
<td>.006</td>
<td>2.48</td>
<td>2.40</td>
</tr>
<tr>
<td>Spreadsheet Software</td>
<td>1.91</td>
<td>.004</td>
<td>2.75</td>
<td>2.72</td>
</tr>
<tr>
<td>Presentation Software</td>
<td>2.06</td>
<td>.005</td>
<td>2.90</td>
<td>2.60</td>
</tr>
<tr>
<td>Email</td>
<td>1.29</td>
<td>.044</td>
<td>1.60</td>
<td>1.96</td>
</tr>
<tr>
<td>Internet Useage</td>
<td>2.59</td>
<td>.000  ***</td>
<td>3.59</td>
<td>2.88</td>
</tr>
<tr>
<td>Digital Image</td>
<td>2.16</td>
<td>.008</td>
<td>3.05</td>
<td>2.16</td>
</tr>
<tr>
<td>Digital Sound</td>
<td>2.53</td>
<td>.000  **</td>
<td>4.08</td>
<td>2.20</td>
</tr>
<tr>
<td>Data Protection</td>
<td>2.09</td>
<td>.000</td>
<td>3.38</td>
<td>1.92</td>
</tr>
</tbody>
</table>

Note: * p<.05, ** p<.01, *** p<.001

All CCP factors yielded statistically significant difference between male and female staff members. Among students, the difference is almost as clear: only ‘Email’ and ‘Word processing’ are roughly equivalent between groups; every other CCP factor shows statistically (highly) significant difference.

The next focus in the third research question is, How does age interact with computing skills? The average age of respondents was 31.3 years (median = 25 years, range 18 to 63). The average age among staff was 45 years (median = 44.5 years, range 24 to 63). The standard deviation was 11.57 years. Students were 22.8 years old on average (median = 21, range 18 to 46). Standard deviation was 5.04 years. One staff member and one student did not report their ages. In Table 3 respondents are divided into two groups, ‘age below median’ and ‘age equal or above median’, and staff and students are examined separately.

Table 3: CCP, age

<table>
<thead>
<tr>
<th>Item</th>
<th>Staff (Age&lt; Median (n=36))</th>
<th>Sig (p)</th>
<th>Staff (Age&gt;= Median (n=44))</th>
<th>Sig (p)</th>
<th>Students (Age&lt; Median (n=44))</th>
<th>Sig (p)</th>
<th>Students (Age&gt;= Median (n=72))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System (Windows)</td>
<td>2.00</td>
<td>.024</td>
<td>2.69</td>
<td>.091</td>
<td>2.60</td>
<td>.068</td>
<td>2.69</td>
</tr>
<tr>
<td>Word Processing</td>
<td>1.89</td>
<td>.015</td>
<td>2.47</td>
<td>.766</td>
<td>2.69</td>
<td>.068</td>
<td>2.69</td>
</tr>
<tr>
<td>Spreadsheet Software</td>
<td>2.14</td>
<td>.109</td>
<td>2.61</td>
<td>.368</td>
<td>3.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation Software</td>
<td>2.11</td>
<td>.005</td>
<td>2.94</td>
<td>.666</td>
<td>3.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td>1.37</td>
<td>.250</td>
<td>1.56</td>
<td>.652</td>
<td>2.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet Useage</td>
<td>2.81</td>
<td>.015</td>
<td>3.49</td>
<td>.710</td>
<td>3.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Image</td>
<td>2.17</td>
<td>.005</td>
<td>3.11</td>
<td>.975</td>
<td>2.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Sound</td>
<td>3.08</td>
<td>.095</td>
<td>3.69</td>
<td>.599</td>
<td>3.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Protection</td>
<td>2.44</td>
<td>.032</td>
<td>3.17</td>
<td>.495</td>
<td>2.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Median staff age = 44.5 years, Median student age = 21 years.

Age seems to be a marginally helpful variable in understanding computing skills among staff. Presentation software and also digital image skills were clearly better adopted by younger staff members, compared to older staff members. But all other factors of the CCP did not manifest statistically significant differences due to age. Among students, the CCP is even more constant: there is no observed divergence among different ages on this issue. One reason for that is clearly quite a homogenous age of students, which is seen in the low standard deviation. In addition to technical skills, attitudes towards applying information technology were also investigated. Respondents indicated their level of agreement with the statement Personally I am interested to apply information technology in my work (1=very much, 5=not at all). Among all respondents the mean response for staff members was 1.58 compared to 1.94 for students (**p=.01). Among male respondents the mean value was 1.49 and among female 1.94. That difference is statistically highly significant (**p=.001). Among staff members aged above 44.5 years (median) the mean value was 1.69 and below median age the mean was 1.47. That difference was not statistically significant (p=.315).
Staff members were asked to evaluate the common level of ICT skills among their students by responding to the statement, *The students' computing skills in my institution are (1=top, 5=very poor)*. Some (9) staff members did not answer that question. The rest of them (n=63) valued students’ ICT skills as follows: 1) 0.0%, 2) 39.7%, 3) 50.8%, 4) 7.9% and 5) 1.6%. The mean value was 2.71. Likewise, students were asked to evaluate the common level of ICT skills among staff by responding to the statement, *The staff members' computing skills in my institution are (1=top, 5=very poor)*. Some (15) students did not answer to that question. The rest (n=102) rated staff members ICT skills as follows: 1) 16.7%, 2) 38.2%, 3) 45.1%, 4) 0.0% and 5) 0.0%, with a mean value of 2.28. If comparing the mean values given by staff to students, and by students to staff, the difference is statistically highly significant (**p<.001**). Students rate the ICT skills of staff members at a higher level than staff members rate the skills of students.

**Conclusions**

The aim of this study was to investigate university-level teacher trainers and teacher students and their perceived skills, interest, and attitudes for using information and communication technologies. The results indicate that at least in this case, computers for staff are not “oversold and underused” as Cuban (2001) claims. Overall, the findings of the study reveal that computers were heavily used; indeed, personal computers seem to be a main tool for most of the respondents. Assuming that an average staff member works 40 hours in week, he or she spends more than 70% of the working time using the computer (an average of 28.2 hours in a week). Over a 40-year career that means some 52,000 hours of computing (freetime usage and six week yearly holidays excluded), which is equal to 2,166 days or 6 years of nonstop usage!

However, this study confirms the idea of diversity among the staff. Computing skills of male staff members were higher than those of female staff members. Males also reported using software beyond the conventional core, while females tended to stay in more routine usage patterns. One reason for that might be that more of the male staff members work in roles that involve technology-based duties. Their average weekly computing hours were also slightly higher compared to females (28.8 hours vs. 27.8 in a week). These weekly computing hours are high indeed: Kumpulainen (2004) discovered that among computer hobbyists (“nerds”), males spent about 33 hours weekly with computers, where as females spent only about 25 hours.

This study does not suggest that all staff members and preservice teachers will need to acquire all the skills included in the CCP. Some skills will be needed by all and some by only a few. The data supported the idea that at the University of Oulu, in the Department of Educational Sciences and Teacher Education, the staff were well prepared to meet the challenge of information society. Their ICT skills were on a high level compared to the first-year students. However, further research is required to find out whether students make any progress in ICT skills during their studies, compared to the staff. Do the differences in skills and attitudes between staff and students even out? What is the influence of training? Does the staff manage to keep their advantage as explicit as it was shown in this study? Further research is also needed to get more extensive national and global understanding of the subject.

In the next ten to twenty years there will be major changes in the ways that education and learning happen; teachers' skills will need to develop alongside these changes. Technology has the potential to change the way we teach and learn (McManus & Kumpulainen, 2002). Advanced skills to master that technology are certainly vital, but still the main transition in education will be cultural. Soon a new generation will rule the world, a generation that has grown up in a digital environment. These digital thinkers are used to make on/off –decisions; they are brave enough to communicate with the whole globe or universe when needed, and digital networks are just a natural extension to their own nerves and senses. Techno culture, currently prevailing in the USA and spreading rapidly, values those citizens who are mastering digital devices (Varis, 1995), and teacher training is no exception to that. This cultural change will be a real challenge for present-day teacher trainers. Enhancing students’ conceptual understanding (Salovaara 2005), yielding positive change in students abilities and work habits (Henriquez & Riconscente 1999, Atallah & Dada 2006), and showing positive gains in achievement on tests (Schacter 1999) - these all will come true if teacher trainers and students as a group work together (Glenn 2000). Mihaly Csikszentmihalyi’s (1990) widely referenced concept of ‘flow’, a mental state of operation in which the person is fully immersed in what he or she is doing, well describes the kind of activity that may eventually characterize our routine interactions mediated by technology.
References
Salovaara H (2005) *Achievement goals and cognitive learning strategies in dynamic contexts of learning.* Faculty of Education, Department of Educational Sciences and Teacher Education. Acta Universitas: Oulu University Press.


Background
There has been a dramatic effort with huge economic resources spent on developing the use of ICT in Swedish education during the years around the turn of the millennium. In higher education the progress has been a bit slower and there has been criticism of the way Swedish teacher students are prepared in these issues. At the same time the teacher education curriculum is explicit, even if not in so many words: we have to offer the students possibilities to learn and to use ICT and to prepare for a life in a society where media has a great influence (KK-stiftelsen, 2004)

To face the criticism there has been an intense development in the area in different ways. At Malmo University the students work with digital production in several ways. In the pre-study 25 teacher students participated in digital media production using digital video and sound devices. The productions then were presented, analysed and reflected on within the group. A few words about the presentation form: When the students show their productions a certain form has been used, called “reception”. Its origin is semiotic theory. In communication the sign is the starting point and the recipient is an important co-creator and the interpretation of the sign is stressed. The students analyses levels of meaning. They talk about their understanding of the text, called denotation, and then they discuss the interpretation of the text, called connotation. Finally the production group reflects on its production and the reactions from the audience together with the whole group (Fiske, 1990; Nordström, 2003; Koppfeldt, 2005).

Aim and Research Questions
Our aim in the pre-study was consciously broad in order to understand student experience of digital media production in initial teacher education. We asked the following questions: What notions of learning and media do the teacher students have in their initial teacher studies? How do they reflect on their work with digital media production? How can their experiences of media production be understood? And how do they reflect on the reception of the media productions?

Methods
The study was conducted at the School of Teacher Education at Malmö University. Data consisted of interviews, media diaries, observations and written reflections. It included 25 teacher students. In the first part of data collection we asked the students to write a diary during three days, including their use of media and their reflections of their use. The students brought their diaries for the interview. The idea was to try to capture not only their ways of using various media but also their experiences, thoughts and feelings and in connection with their notions of learning. The media diary offered a way to conduct the interviews with a concrete point of reference and became an artifact used in the process of mediation.

The interviews were succeeded by production. The students worked in groups of four during two days with subjects like “To become a teacher”. The third day the whole class met again in the moment of reception. The students listened, watched and discussed the entire day according to the model described above. We were observing the reception, taking notes, but we do not regard the observations to be the main method in this pre-study.

In connection with each reception we asked the students to write reflections to us. The idea here was to examine the different ways the students had experienced the process of media production. Another idea was to bring a multimodal (Kress & van Leuwen, 2001) approach to the research. By using different modes (for example speech, the written word, talking, watching and listening) we had a conception about how we could approach our aim of the study and maybe deepen our understanding.

What about the process? At first we were aiming to observe the actual process, while the students were making their film or their sound product. But soon we realised that a more ethnographic approach was needed. We tried to observe the students’ storyboard production as well as their discussion and their editing, but understood that these processes are proceeding day and night, in school and out of school, in their minds and between the students in their conversations, in mobile phones, text messages, e-mail and so on. How to grasp all that? So we decided to concentrate on the students own reflections of the process.
Theoretical framework
We understand media production as a dynamic process where reflection and negotiations play an important part (Buckingham, 2003; Kress, 2003; Lindstrand, 2006). Our understanding of this process is framed within sociocultural theory (Säljö, 2005; Wertsch, 1998) where development and learning are a social process. Interaction is a key word. We are part of a culture, both as participants and creators. In this participation we are formed by artifacts as cultural tools. At the same time we are forming these cultural tools (Säljö, 2005). Wertsch (1998) stresses activity as a key concept in sociocultural theory. Activities are social, mediated, situated and creative. Thus, mediated action involves cultural tools such as semiotic signs used when reading, painting, filming and so on.

The sociocultural perspective connects to multimodal theory (Kress and van Leeuwen, 2001; Kress et al. 2001; Kress, 2003). In this theory also, interaction between humans are emphasised, but with more modalities than the written and the spoken word. The conception is that all communication is multimodal. Modalities as gestures, film, clothes and so on are thought upon as resources of making meaning (Jewitt, 2006). The spoken and the written word are modalities amongst others. Thus is the producer of a multimodal text choosing between different semiotic resources in order to communicate with the reader. To design is shaping and reshaping of resources and a matter of choice (Kress et al. (2001). Different modalities interact and in the designing process we can find a movement between modalities. The key concept here is that the meaning is produced both in the creation and in the reception of the multimodal text (Lindstrand, 2006).

Results
The pre-study shows that media has a great influence on students' everyday lives. They are positive when reflecting on media as possible learning enhancement. They do tend to use a hierarchical classification when they discuss media and important media for learning are – according to the students – books, newspapers and internet. The written word dominates (Drotner, 2001). The students express what they call “a generation gap” when they talk about the young pupils as media competent in contrast to themselves and their lacking knowledge of media such as using digital video for example. Using the technology worries them. They emphasise the need of critical reflection on media and in that part they consider the teacher an important agent.

After working with the digital media production the hierarchy fades in the student reflections. Their perspective on media broadens and their fear for technology decreases fast and considerably. Working with a digital media production means working with both production and reflection (Buckingham et al., 1995) and the students are beginning to develop a multimodal literacy (Jewitt & Kress, 2003).

In the written reflections the students picture how they use the multimodality of resources to create meaning. This was also observed at the reception. The students describe their learning process in the project as a dialectic relationship between doing and analysing (Buckingham, 1995). To produce with digital media includes a variety of choices, negotiations and modalities (Kress & van Leeuwen, 2001: Lindstrand, 2006). Thus, their reasoning relates to the movement between modalities were the process from creative brainstorm, making story boards, discussing, recording, editing, showing the film in public and so on are of importance for their learning process. And at last: The students stress the reception of the media productions. The dialogic approach at the reception made the students reflect together with their peers. By analysing the work of others as well as their own work and meeting with audience response students describes how they were able to generate new insights. These insights regard both the design and the theoretical content of the multimodal text

Conclusions
The students describe working with a digital media production as motivating, creative and fun. Working with media in this way brings new ways of understanding theory. The student compares the process with “traditional ways” in higher education where the written word dominates and point out the possibilities to work with theory in different ways. In a sociocultural perspective learning is social and collaborative (Cole, 1996; Säljö, 2005). The social activity pervades the student reflections. They find media production a collaborative process and they write about it as important teamwork, bringing the group together. Designing together becomes learning from each other.
The students highly stress the importance of the reception for their learning process. Buckingham et al. (1995) have written about the importance of having an audience for the media production and how the students produce with that audience in mind. Kearney & Schuck (2006) regard the meeting with an audience as a way of celebrate the students’ learning. The reception in our study brings the concept of meaning, and the interaction between the producers, the multimodal text and the recipients in focus. Multimodal theory emphasises the agency of audiences as active makers of meaning. The design embodies the reading of the multimodal text (Burn & Parker, 2003).

This leads us to the next part in our forthcoming thesis were we want to concentrate on the reception as a possible reflecting mediating moment. Students are being both producers and audience and the multimodal texts are an important part of that collaborative process. How can we understand the interaction at the reception between the producers, the multimodal texts and the recipients? How can we understand the dialogues and the negotiations? To approach the reception we are going to observe sessions with digital video and are also analysing the multimodal texts.

Multimodal theory offers a way to understand the interaction between the students and the multiplicity of modes of communication. Combined with sociocultural theory as Bakhtin’s (1981) concept of dialogue and Rommeitleiv’s concept of intersubjectivity (Mortimer & Wertsch, 2003) which highlights the negotiation process in the dialogues, we may have found a theoretical way that comprises the process of learning in digital media production.

References
New on-line teaching qualification for college lecturers: An evaluation
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Introduction
The paper focuses on a newly developed, highly innovative online, distance learning qualification for College Lecturers, delivered by the University of Dundee. The learning is facilitated through an interactive Virtual Learning Environment (VLE) and uses a Constructivist learning and teaching approach. Initially, the rationale and design of the VLE will be discussed and this will lead into our research project which explores the efficacy of the Discussion Fora for participants on the programme.

The TQ(FE) programme aims to provide a comprehensive teaching qualification for experienced lecturers working predominately in the College Sector. Traditionally, this is delivered on a face-to-face basis; however, here at the University of Dundee we have developed a state-of-the-art, distance on-line learning programme supported by the Virtual Learning Environment (VLE). Britain and Liber (1999:10) state that the VLE used in an educational context ‘…is inherently more pro-active from the student’s perspective…’. This correlated with our view, but was not evidenced by our participants’ behaviour which was reticent in this environment and was tutor driven.

Distance learning can take many forms and is usually sought in situations where face-to-face contact is not possible, or at least for the most part. Increasingly, educationalists have been exploring more flexible delivery mechanisms and curricula for which the drivers are multifarious and complex, including: improving the quality of the teaching and learning experience and process (Yetton, 1997); the shift from short term, subject focussed learning to ‘lifelong’ learning (Bates, 2005; Rigmore & Luke, 1995); the need to tap into a global market (Nicol et al, 2004); widening access, and embracing diversity (Yetton, 1997); social inclusion and employability agendas (Rigmore & Luke, 1995); the ‘new’ knowledge society (Collis & Moonen, 2005; Laurillard, 2002); competition from other universities (Yetton, 1997); and the private sector (Nunan, 1996; Twigg, 2002).

Our drivers were various and included most of the above, we were particularly drawn towards a mode of learning that promoted and supported the development of autonomous learning and facilitated participants’ control of their own learning and decision-making processes. There is little hard evidence of programmes that have introduced flexible learning that both increases learner choice and improves learning (Nicol et al, 2004). However, a notable exception is the ‘Pew Learning and Technology Program’ (Twigg, 2002), which demonstrated that course (re)design and the incorporation of ICT within programmes, could provide learners, academics and institutions with an improved learning experience.

University tutors and College mentors encourage participants to become independent learners aware of their own learning styles, meta-cognitive processes and development needs. Through the interactive VLE participants are also encouraged to move towards collaboration with peers to foster a community of practice for greater efficacy. A Constructivist theoretical approach is adopted in the design of the VLE for this programme. Construction and co-construction of knowledge is fostered by the VLE design which is non-linear, interactive, and reflexive. Britain and Liber (1999:12) state that the VLE’s ‘most interesting role is as a medium for supporting constructivist and conversational approaches to learning. The authors’ reference Laurillard’s (1993) conversational model and develop it in relation to following “key characteristics”: discursive; adaptive; interactive; reflective’.

Throughout the Programme, participants engage in dialogue and reflection about their teaching, their learning and their learners’ learning. To facilitate this process, participants are put into managed virtual discussion groups of around 15 people. Here they can access discussion fora fostering ongoing debate, discourse and engagement in peer and tutor support and critique.

With a distance learning programme such as this, we firmly believed that the participants would require additional support other than just the programme team and we were conscious of a need to nurture and develop peer supported collaborative learning. It was initially believed that the discussion board would go some way to develop these learning relationships and establish effective communication between our participants. Our views, on the collective need of our participants to have programme team and peer input, was substantiated by Holmes and Gardner (2006:106) who stated that: “The more support a learner feels they have, whether through access to several tutors, external experts or peer colleagues on the same
course, the more likely they will be well disposed to the course and will succeed”. This belief led us to undertake this research project and explore why the discussion board fora was not utilised as much as we had initially expected.

Method
Our research project began with detailed observation of the discussion fora usage. This was done through careful analysis of the data available through Blackboard and analysis of the Course Statistics. There were clearly limitations to this as we were able to analyse our participants’ access to the discussion fora but not whether they engaged with the environment. As stated in Blackboard Library (2004):

when viewing reports that include hit or access statistics, a hit is tracked every time a request is sent to the Blackboard Learning System. For example, when tracking use of the Communication Area: a Student accesses the Communication area (1 hit), clicks Discussion Boards (2 hits), clicks a forum (3 hits), and clicks a message to read (4 hits).

With the course statistics we were able to identify that our participants were engaging fully with the VLE but not visiting the discussion board as regularly as we had expected and through checks made on the board itself we were able to see they were not posting threads. It was necessary to focus in on the particular aspects of our participant group’s usage and ascertain whether they were in fact able and willing to use this communication tool effectively.

The questionnaire was chosen as the preferred method, as it enabled us to gather specific and accurate information. ‘This is a complex process which involves presenting questions in a clear and unambiguous way so that the respondent may interpret them, articulate his or her response and transmit it effectively to the researcher’ (Wilkinson and Birmingham, 2003: 8-10). As there were two specific areas that could potentially affect our participants’ usage of the discussion group, we created two phases of questionnaire. The Questionnaire Phase 1 - was sent out to all our participants and investigated ICT familiarity/usage and ICT skills and efficacy with both users and non-users of the discussion fora. The results of this allowed us to identify participants who had varying levels of confidence in ICT, thus moving into the next phase of research which was to look more specifically at the discussion fora. Questionnaire Phase 2 – explored participants who actively used the VLE but did not engage in the discussion fora and sought to identify the perceived enablers and barriers to using the discussion fora. We selected a specific number of participants who engaged with the VLE and had been identified as having displayed high levels of confidence in their ICT skills and efficacy. We further categorised these participants in relation to their usage of the discussion board; with frequent, seldom and non - frequent users being identified categories. We selected 5 participants from each of the categories in order to give a balanced view of the discussion board from all perspectives.

Results and Data Analysis
Phase 1
Our sample for Phase 1 of the study, were sent a questionnaire electronically, by email, to 160 participants on the current 2006/07 programme (shown in appendix A in word format). This was an online questionnaire. Of the 99 participants who opened the questionnaire, 73 responded by filling in the online form within the two-week timeframe, which was a 74% return ratio. Figures 1 show the age range: 69% were female.
We explored the participants’ general confidence and use of Information, Communication and Technology (ICT) in their own teaching and learning environment. This enabled us to identify the role of ICT as an enhancement of the learning and teaching processes. Figure 3. shows that the majority of respondents had a medium to high level of confidence in their use of ICT for both teaching and learning and it was from this data that Phase 2 participants were selected.

As learners on the TQ(FE) programme the respondents felt a high degree of satisfaction with the online element of the programme. Figure 4. illustrates that there was concordance between respondents that using ICT was enjoyable and led to an overall sense of satisfaction with ICT and the VLE as a medium for learning.

Phase 2
Of the 73 respondents who took part in Phase 1, 15 were selected to take part in Phase 2 of the research. This involved sending out a more specific questionnaire (see appendix B), which related to the discussion board element of the VLE. Of the 15 selected, 11 responded within the 1 week time-frame, equating to a 73% return ratio.
There was an immediate disparity between the previous questionnaires’ findings, which suggested that our participants had a high level of confidence in their ICT skills and efficacy. We can see in Figure 5. that in the discussion board element of the VLE our participants did not mirror this confidence in the basic skills of online chatting, posting and replying.

![CONFIDENCE - Discussion Board](image)

**Figure 5. Participants’ confidence when using the discussion forum**

**Results: Phase 2**

Despite having extensive experience in using ICT in both their teaching and learning environments our research highlighted the fact that 64% of the returns in Phase 2 had no previous experience of discussion boards or chat rooms. Much of the experience that participants had engaged with had been on a very basic level, with only three of the respondents having had widespread experience of the discussion board in their own teaching experience. Some general avoidance of discussion boards was evident with comments such as ‘no interest or time for chat rooms’ was recurrent.

64% found the discussion board easy to navigate around; however, some comments were made that they had difficulty getting in to the discussion board to begin with. One respondent stated that the ‘discussion board’ title was not used but once found in ‘My Groups’ it was easy to use’. Once they had connected to the discussion board the majority felt they were able to use the facility. More than half of our respondents did not engage with the discussion board with 55% stating they were not comfortable using the discussion board element. When this was interrogated, participant apprehension appeared to be due to lack of training in the mechanics of the fora and of a perceived dislike of the medium.

Communities of practice had been established to provide the students with small groups of online ‘friends’ to chat to in the discussion groups. These were called after famous Scottish birds and became known as the bird groups. Only 18% of the respondents found these communities (bird groups) beneficial to their use of the discussion board with comments such as ‘small groups can be effective but you still need contributors’. Contrasted to, 27% who found the groups to have no benefit to their engagement and, in fact, led to the following comments ‘It has isolated me from all the others, because none of the other students in my bird group are contributing, anyone geographically near to me is in another bird group – I have no access to them for discussions’ and ‘I do not know who is in the group and I would prefer to know who I am conversing with’. 55% did not feel the groups had an effect on their usage of the discussion board.

Comments were also raised about students’ preferences in who they wished to communicate with in the discussion board. 73% felt that they wished to engage with both their peers and the staff/tutors in the discussion board. ‘It is true that a more frank and interesting point of view may come from a peer, where a tutor would be more constricted by the ‘party line’. However, I don’t have a preference and would value any discussion’. 9% would rather engage with their tutor/staff exclusively, adopting a pragmatic stance,
for example, ‘Most of my problems are course specific so I am more likely to contact my tutor’. This left 18% of the respondents who wished to engage in discussion purely with their peers.

Participants were asked to comment on how the discussion board had enabled them during their TQFE programme. These comments proved to be a mix of positive and negative experiences. Some of the respondents felt the discussion board enabled them to ‘gain insight from other students’ and helped them to share in information that they might not have known. A recurring comment was that other users’ ideas provided them with reassurance that they were ‘on the right track’.

Our research enabled us to establish a pattern of similar responses and we grouped these as perceived enablers and barriers. It was evident through our respondents’ comments that even those who had not engaged fully with the discussion board could identify situations that would benefit them in the use of the discussion board. We explored the positive comments that came from the questionnaire in Phase 2. The perceived enablers had the potential to provide the participants with a medium for both challenging and directing their learning. The opportunity was there to follow and join in with discussions as they progress. A particular strength was seen to be the fact that points could be raised without these being challenged before they had been fully explained, as can often happen in face-to-face dialogue.

The perceived enablers were: -

- An ability to follow (history) and review a discussion
- An ability to communicate with distant others
- An ability to express own viewpoint without interruption
- An ability to read postings with different and unexpected points of view (challenging own ideas)
- An ability to reassure that the participants’ ideas are ‘on the right track’.

Equally important were the perceived barriers that our respondents felt impeded their engagement with the discussion board. We determined these in order to provide solutions, which would allow us to develop a better framework for the discussion board that would encourage use.

The perceived barriers were: -

- Too long a gap between replies to make it valid
- Inability to know who is reading the posts
- Only valuable if contributions are meaningful
- Uncomfortable with the idea of online ‘chatting’ with people
- Unsure of how to use the facility
- Fear!

Discussion and Conclusion

In a recent study of undergraduate students by Caruso and Kvavik (2006) they found that 51% perceive that the most valuable reason for using technology in courses is for the convenience it affords with only 11% scoring communication with peers and teachers highly. It was important for us to establish if this trend continued with our distance learning participants. Our results show that the vast majority of our participants sampled felt that the discussion board element of the VLE was a valuable resource and would aid their learning. However, in its current format it was not meeting its full potential.

Response to research findings suggested that improvements were required to the discussion fora in order to foster meaningful interactions. Garrison and Anderson (2003:23) investigated what practices needed to be established to achieve a successful community of practice within the VLE and concluded that ‘teachers and students transacting with the specific purpose of facilitating, constructing and validating understanding, and of developing capabilities that will lead to further learning’. They identify three key elements which are: cognitive presence; social presence; and teacher presence, and state that it is the balance of these presences that is important in the construction of communities of practice. It was clear from our participants that the aspect of social presence was an area that they were having most difficulty engaging with. Social presence is defined by Garrison, Anderson and Archer (2003:94) as ‘the ability of participants in a community of inquiry to project themselves socially and emotionally, as ‘real’ people (i.e. their full personality), through the medium of communication being used’.

Kotrlik and Redman (2005:205) referenced the work of King (2003) who had cited four stages in the use of technology in learning, namely:

- …fear and uncertainty; testing and exploring; affirming and connecting current
knowledge; and a new perspective of using technology in educative processes. This resonates with our study usage was compromised by uncertainty and fear about the medium.

As a result of our research a number of changes have been made to the structure of the discussion board forum.

Changes made: fostering a community of practice
- Participants now share personal email addresses to encourage communications at many levels
- Discussion Groups are arranged by level of study i.e. Postgraduate or Undergraduate
- Participants are taught by the same tutor
- At face-to-face workshops, participants are grouped together – peers and tutor.

These changes were identified as being in line with our respondents’ need for a connection with the other participants and sought to encourage a social presence.

Our research had also highlighted dissatisfaction in the time taken to respond to their postings. This had been an area that the programme team had found concerning. How could we nurture discussion without being the dominant voices in the discussion board? Mazzolini, Maddison (2003) highlighted this issue and suggested that one should make one’s presence known in the discussion boards, but not to dominate or overwhelm by too frequent posting. Posting too frequently leads to short discussions and fewer student postings; posting too infrequently leads students to believe the instructor is disinterested or absent. The role of the programme tutor is further explored by Salmon (2006:31) where she argues that ‘The value of an online discussion can be very high so long as the interest and focus last. But there is no need artificially to extend discussions and plenaries. We had to adopt a role as tutors that nurtured and encouraged discussions but only where they were relevant to the students’ learning experiences.

Changes made: e-moderation increased
- Discussion Board has been renamed ‘Your Discussion Groups’
- Nominated Programme tutors to check ‘postings’ regularly and encourage use
- Discussion threads are accessed directly from the Module materials, thus strengthening the link between ‘talk’ and learning.

In our research there was much comment made about a need for training in order to enable the participants to make full use of the discussion board facility. This has been addressed by providing our participants with ‘hands on training’ at our mandatory Induction workshop at the beginning of the programme. Participants are given the opportunity to post and reply to threads that are both social (perceived non-threatening) and TQ(FE) (subject specific) related. University staff are on hand in the small group sessions to provide assistance as and when required.

It was also established that although participants could benefit a great deal from this hands on experience, much of what was shown to them during induction was not retained. This led us to explore the use of Camtasia software, which provides a video with screen capture that leads the participants through the protocol required to find the discussion board, navigate around and post and reply. This feature was placed in the resources section of the VLE for participants to access as required.

The issue of students remembering and reacting to technical issues related to the VLE led us to develop a problem page facility within our VLE. The first phase of our research had clearly established that our participants had high levels of confidence in their ability to email, so we felt this was a comfortable environment for our participants to explore further issues. We positioned the link to the problem page (Auntie Effee) in a prominent position on the Programme Home Page and monitored the emails regularly. Participants can ask specific, technical or learning questions with relative anonymity as pseudonyms are used in the replies.

Changes made: training needs analysis
- Participants are inducted to the VLE and given specific, and grounded training
- Additional online support is available from University’s support staff
- ‘Camtasia’ software is used to demonstrate how to use VLE discussion facility
- Programme specific advice is now available via a ‘Problem Page’ – Auntie Effee (this will generate a repository of Frequently Asked Questions (FAQs)).
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Accessed 12/4/07


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accessed 07/09/2005


78
The purpose of focus groups in ascertaining learner satisfaction with a virtual learning environment

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Introduction
This paper presents a case study of learners on an introductory (Level 1) Further Education (FE) course in ICT ascertaining their level of user satisfaction with a virtual learning environment (VLE). The outcome of this study will be used to inform future VLE material design for inclusion in a School policy document. Additionally, the findings will contribute to the development of both a broader range of discrete ICT programs delivered by a VLE and embedded ICT within a range of vocational qualifications across the Post Compulsory Education Vocational Curriculum.

Focus groups have been in evidence since the 1920s. At that time, they were in the guise of survey questionnaires related mainly to products and the customer requirements of a product. During World War II and up until the 1970s, focus groups were used for market research to elicit wants and needs. From the 1980s onwards, the use of focus groups has been used mainly in the health arena and in examining social issues. Since then social scientists and program evaluators have found focus groups to be useful in understanding how or why people hold certain beliefs about a topic or program of interest. Krueger and Casey (2000) identified that focus groups can be used for program development and evaluation, planning, and needs assessment. Morgan (1998, pp58) says that ‘the conversations in focus groups can …. be a gold mine of information about the ways that people behave and the motivations that underlie these behaviours.’ David Morgan’s book ‘The Focus Group Guidebook’ (1998) has been used throughout this study as the empirical work containing the methodological approach and the validated data-gathering instrument for the Focus Groups.

When designing the VLE interface, factors such as navigatability, learning activities and resources for use within the computer-mediated environment (as is a VLE) were instrumental in the learner satisfaction of the VLE. The work of Robert Gagné (1965) is critical in any study using computers for learning and illustrates the importance of his Instructional Design (ID) to an underlying theory of computer-based learning. Gagné theory stipulates that there are several different types or levels of learning. The significance of these classifications is that each different type requires different types of instruction. Gagné’s Nine Events of Instruction (a sequence of learning events borne out of his ID theory) addresses learners in terms of the logical steps that are mapped to the way they learn. The events are; gain attention, inform the learner of the objective, stimulate their recall of prior learning, present the stimulus, provide learner guidance, elicit performance, give feedback, assess performance and enhance retention and transfer of learning. Using this premise, designing a VLE with learners for whom written communication is difficult and numerical skills underdeveloped, requires ‘constant revising and adjusting of our uses of technology to better meet the needs of the program and our students’ (Bucci et al 2003), yet is ideally matched to Gagné’s theory of developing computer-based learning using his ID to change the capabilities of the learners.

By the very nature of the flexibility that can be achieved in designing a VLE, a vast range of stimulus can be embedded and these will address the learners preferred learning style and learning processes, which are not completely understood, and are different in detail from one person to another (Bostock 2005). This is clearly evidenced in this case study and its learners, where a detailed analysis of pre-VLE knowledge was essential as well as a breakdown of the learning style of the learners so as to maximise their achievement and success against specified learning objectives.

Method
This study used a mixed methods data collection approach where agency was given to both quantitative (Likert-scale questionnaire) and qualitative data (Glaser & Strauss 1967) thereby triangulating the results. Creswell (2003, p208) makes clear that the perceived legitimacy with which the mixed methods approach is being promoted is expanding. A new ‘Handbook of Mixed Methods in the Social and Behavioural Sciences’ (Tashakkori and Teddlie, 2003) is cited within Creswell (ibid) as the foremost publication in the field of mixed methods research.
All learners in the study completed a pre-VLE questionnaire (Table 3) that identified their personal profile, general level of computing experience (including using the internet/web), concerns they had about using a VLE in their learning and were asked to rank a number of learning activities/resources they had previously used in their educational history. This was used to inform the design of the interface of the VLE and the resources/activities within it. Care was taken in the design process such that there was ease of navigation for the learner, and a simple hierarchical structure for the relationship between the course elements to encourage the learners to make appropriate connections within or between each resource and/or activity. Usability, flexibility and pedagogy attributes were considered at all stages of the VLE design as content management shortcomings militate against making any improvements once the VLE is ‘live’ especially if those improvements involve structure (Vogel 2006).

In this case study, 39 students were actively recruited and all completed the pre-VLE questionnaire before being exposed to the VLE itself. Learners in this study signed an agreement that gave permission for transcription and hard copy storage of the focus group discussions. All participants in the study had sight of the transcripts at the final stage before coding and were able to discuss changes they felt needed to be made where meaning or incorrect transcription had occurred. Whilst the learners knew each other as a group on the same ICT Program, the focus group selection process ensured that the ‘friendship groups’ that existed were separated to allow full and frank discussions to take place (Krueger and Casey 2000). Kitzinger (1994) explains that the group situation creates the group’s own hierarchy of importance, their own words and language. Data emerges from the interaction of the learners in the focus groups, in a language that is native to them alone (Fine 1994). This then has to be delicately decoded to elicit the themes contained therein.

Focus groups are a collectivistic method as defined by Denzin and Lincoln (2003) based on theoretical and methodological considerations. For example; consideration has to be given to how many groups will be held? How many people will be involved in each group? The focus group is an unstructured interview guide with introductory questions. There is an overt need to state that there are no ‘right’ or ‘wrong’ answers. That it is perfectly acceptable (in fact preferred) if there is disagreement on topics. There is much controversy about prior analysis by the researcher of the situation in which the subjects have been involved. In a study by Hart (2001), 8 focus groups were used and looked at the experiences and impressions of children in public schools in the United States had with computers. The learners were in public school in Florida, Maryland and Illinois. One of the most surprising findings was that the learners felt that the quality of their education depended on the teacher and not the technology as a better way to learn. This is supported in part by Ainley et al (2000), whose studies showed that learners, teachers and parents felt that computers have a positive effect on learning. US Research shows that the presence of computers and Internet at home has a strong positive association with academic outcomes of school children, particularly children from disadvantaged backgrounds (Wilhelm et al 2002).

Research Design
The group of 39 learners was composed of 35 males and 4 females, with 27 aged 16, 8 aged 17 and 4 ages 18. The home postcode (zip code) for the learners was spread over a 10 mile radius from the College and included areas associated with low-status housing, either local council owned or starter homes as well as ‘poor’ housing in south east London (SE2).

The pre-VLE questionnaire was aimed at establishing the learners’ pre-existing level of computing skill and those chosen for inclusion in question 2 and 3 of the questionnaire were explicitly required for the learner studying on the introductory ICT program. Learners were asked to score their response to each of the statements as 1 (no experience), 2 (some experience) or 3 (extensive experience). Question 4 was aimed at identifying whether the learner had found a prescriptive range of learning activities and resources useful in their learning history. Question 4 required the learner to respond to each learning activity or resource as 1 (not useful), 2 (some use) or 3 (very useful). Question 5 required the learner to respond as 1 (no concerns), 2 (some concerns) or 3 (extensive concerns) in respect of their anticipated concern with using a VLE in their learning.
**Table 1: Pre-VLE questionairre**

<table>
<thead>
<tr>
<th>Question Number</th>
<th>Question(s) asked/data collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General learner profiling information</td>
</tr>
<tr>
<td></td>
<td>Student registration number Name, Address, Postcode (zipcode)</td>
</tr>
<tr>
<td></td>
<td>Gender Age at 1st September 2005</td>
</tr>
<tr>
<td>2</td>
<td>General level of learner computing experience</td>
</tr>
<tr>
<td></td>
<td>Burn a CD Move files</td>
</tr>
<tr>
<td></td>
<td>Insert clipart image Wordwrap text</td>
</tr>
<tr>
<td></td>
<td>Insert a table Merge two cells</td>
</tr>
<tr>
<td></td>
<td>Mail Merge Animation in Powerpoint</td>
</tr>
<tr>
<td></td>
<td>Insert pictures Insert hyperlinks</td>
</tr>
<tr>
<td>3</td>
<td>Experience of using the internet/web in their learning history</td>
</tr>
<tr>
<td></td>
<td>Send and receive emails Research information from the web</td>
</tr>
<tr>
<td></td>
<td>Use MSN or equivalent Download a podcast</td>
</tr>
<tr>
<td></td>
<td>Use a webcam</td>
</tr>
<tr>
<td>4</td>
<td>Usefulness of a learning activity or resource used in previous learning history</td>
</tr>
<tr>
<td></td>
<td>Essay writing Report writing</td>
</tr>
<tr>
<td></td>
<td>Short answer questions Reading text books and/or journal articles</td>
</tr>
<tr>
<td></td>
<td>Accessing/downloading reports/articles in word or pdf format.</td>
</tr>
<tr>
<td></td>
<td>Powerpoint presentations Listening to lectures</td>
</tr>
<tr>
<td></td>
<td>Online groups activities Chat rooms</td>
</tr>
<tr>
<td></td>
<td>Discussion forum/message boards</td>
</tr>
<tr>
<td></td>
<td>Watching short video clips Assessment using online multiple-choice questions</td>
</tr>
<tr>
<td></td>
<td>Gapped Handouts Analysing numerical data</td>
</tr>
<tr>
<td></td>
<td>Drawing charts and graphs Presentation of work to peers and tutors</td>
</tr>
<tr>
<td>5</td>
<td>Concerns that learner had about using a VLE in their learning</td>
</tr>
</tbody>
</table>

The focus group meetings were held during the learners weekly group tutorial sessions (one hour long) over a period of six weeks. Rooms were allocated that were comfortable and non-threatening and informal debriefs were set up so the participants could wind down post-focus group session. Data was collected against the questions asked using notes and then (latterly) recordings that were transcribed and coded. Full focus group questions reproduced below.

**Table 4: Focus group questions**

<table>
<thead>
<tr>
<th>Question no.</th>
<th>Question asked/data collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What were the learner responses when they looked at the VLE for the first time?</td>
</tr>
<tr>
<td>2</td>
<td>How did the learners find the experience of using the VLE for:</td>
</tr>
<tr>
<td></td>
<td>Curriculum activities?</td>
</tr>
<tr>
<td></td>
<td>User Interface (navigatability)?</td>
</tr>
<tr>
<td>3</td>
<td>What was the learner perspective on the parts of the VLE raised as not so good?</td>
</tr>
<tr>
<td>4</td>
<td>How has the VLE learning fitted in with other types of learning for the program?</td>
</tr>
<tr>
<td>5</td>
<td>What are the most valuable aspects of the VLE for the learner? (data collected on an individual basis).</td>
</tr>
<tr>
<td>6</td>
<td>Taking into consideration all the discussions so far, please rate learner satisfaction of the VLE on a scale of 1 – 5 (1 - will not lead to a chance of success on program, 5 - will greatly improve chance of success on the program).</td>
</tr>
</tbody>
</table>

* based on Morgan 1998, & Vogel 2006

Question 6 required the learner to respond on a 5-point Likert scale. The change from a 3-point Likert scale used in the pre-VLE questionnaire was intended to broaden the categories of learners response such that learners could differentiate between ‘might lead’ and ‘will definitely lead’, thereby identifying their confidence in the VLE as a contributory factor to their success. Learners were asked to score their response to the statement in question 6 as 1 (will not lead to a chance of success on the program), 2 (might lead to a small chance of success on the program), 3 (might lead to good chance of success on the program), 4 (will definitely lead to a small chance of success on the program), 5 (will greatly improve chance of success on the program). Researchers disagree about the correct number of participants for a
successful focus group. Many say that 8 – 12 (Kitzinger and Barbour 1999), 6 – 12 (Lindlof 1995), 6 – 8 (Krueger 1988), 5 – 8 (Green and Hart 1999). Focus groups in this case study were 5 – 8 strong to get enough groups to derive sufficient data to analyse learner satisfaction.

Findings

Questionnaire:

Learners’ response to question 1 and scored response to questions 2 – 5 for the pre-VLE questionnaire were entered into a spreadsheet and analysed using numeric, statistical and graphical methods. Learners gave themselves an overall low score in the area of ‘general computing experience’ with 80% of learners replying that they had either no experience (47%) or some experience (33%) in the computing skills required for studying on the introductory ICT program (figure 1).

Unsurprisingly, all learners had a high pre-existing level of experience of using the Internet/web in their learning history with only 14% of learners replying that they had either no experience (2%) or some experience (12%) in the use of the internet/web in their learning (figure 2).

The usefulness of a range of learning activities/resources resulted in mixed responses. Some learners felt that simple activities with answers (gapped handouts, online multiple-choice questions) were much more useful than overly long essays/reports that were required in some cases. Other learners identified group activities using chat rooms/discussion forums as useful as this was something with which they felt they had ‘loads of experience’.

Learners scored low in their concerns about using a VLE in their learning with 54% having ‘No Concerns’ (21 learners), 33% having ‘Some Concerns’ (13 learners) and 13% having ‘Extensive Concerns’ (5 learners). This is not unexpected and goes someway to validate the learners self-assessed
high level of experience in using the internet/web (Q3). It is suggested that this (apparent) lack of concern with using the VLE has been translated by the learner as the learners’ expectation that the VLE will be very similar in use to the internet/web and therefore have no concerns for them.

**Focus groups**

Results from analysis of Q6 of the focus group questions indicate that 40% of the learners are dissatisfied with the VLE content and scored either 1 (will not lead to improved chance of success on the program) or 2 (might lead to a small chance of success on the program).

The focus group sessions were coded immediately following the session where every line, paragraph, or other section or text was coded for relevant themes. As these were identified, they were assigned a working code. This meant that definitions were constantly challenged and new codes developed (Glaser and Strauss, 1967).

Saturation was reached after 26 transcripts were decoded. No new codes were required, no new categories emerged and any new transcripts only produced a repetition of themes already identified. Themes identified were: ease of navigation in the VLE; clear content; able to revisit difficult topics but didn’t like all the on-screen reading; the hot-links were all active; the hot-links were to good sites; charts/graphics made understanding numbers easier; audio would have helped with all the reading; the chat rooms were ‘cool to hang out in’; it was difficult to get in touch with a tutor and that scheduled real-time chats (RTC) with a tutor would have been better; email messaging system was a good way of keeping in touch if off sick or during holiday periods; the use of the diary was considered to be useful as a reminder for homework/assignment hand in deadlines and could be used for recording all kinds of calendar events (not necessarily academically related ones); the use of group-based activities were a good way of improving skills and knowledge by sharing ideas with peers; the inclusion of a variety of small activities made the VLE much more interesting to use.

**Conclusion**

Overall the case study was considered successful in that it identified pre-existing areas of concern for the learners that were to use the VLE. These concerns would be included as part of the redesign brief for the VLE interface and learning activities. It also identified that those learners whose predominant learning style was either kinaesthetic or auditory, would require different ways in interacting with the materials in the VLE. It also confirmed that not all learners’ needs were catered for by developing a VLE that was ‘fit for the masses’ and that 40% felt that it would not improve their chance of success on the programme. It is acknowledged that the study is limited in that it focussed on a narrow range of learners and ICT programs. As a pilot study, whose aim was to ascertain learner satisfaction with a VLE, using focus groups as the main data collection instrument, it is felt that the results show that that has been achieved. In the next study, a larger female cohort will be studied as the statistical analysis was impeded by the small female representation.

The use of focus groups in this study has been shown to be a sound method of inquiry by using an already validated data-collection instrument and triangulating the results with a quantitative questionnaire. Focus groups are ideally suited for small groups where a one-to-one setting can be threatening and are most effective where the groups are comfortable, there is no peer pressure and intimate topics are not being discussed. They are the data gathering method of choice for use in ‘plural voice’ situations (Fine 1994) where learners can use their own language and words leading to the participant’s involvement as key players in the future development of both a broader range of discrete ICT programs delivered by a VLE and embedded ICT within a range of vocational qualifications across the Post Compulsory Education Vocational Curriculum.

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If it ain’t broke, don’t fix it: The development of mathematics education in England over the past 100 years
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Northumbria University, England

As I reach retiring age I wonder what has changed in the mathematics education field over the past sixty years and why do we always seem to be announcing new developments, changing the curriculum, developing new strategies etc. Are these changes really necessary and do they really offer something new? The title of the paper is an old English saying, suggesting if everything is operating satisfactorily we shouldn't attempt to change it or bring in new ideas. Changes in mathematics learning and teaching in England, whether major or minor, are not new and many would suggest that we have actually moved very little since late Victorian times.

In 1998 when the National Numeracy Strategy suggested a 'move back' to whole class teaching with an emphasis on number, for many this brought back the image of the Victorian classroom where children learnt their mathematics by rote.

In addition, great emphasis was placed on the children's presentation of their work. Teachers working in state education were paid by a system known as 'payment by results', and government tests were given annually to measure success. How interesting that the last statement was part of the Numeracy Strategy some 100 years later and many would argue that payment by results is still with us as part of the published league tables.

In the early 1920, education in general, was beginning to be influenced by the work of Friedrich Froebel, and Margaret and Rachel McMillan. As a brief summary their main thinking suggested:

- the importance of the development of each child;
- the role of the teacher as a professional provider of encouragement;
- the teacher as the person offering the child opportunities for play and enquiry activities.

### Victorian Mathematics Teaching

- mathematics lessons were very much arithmetic based;
- there was no agreed curriculum, with each school deciding what was to be taught, but concentration was on the so called ‘Basics of the 3Rs’;
- teaching was very much didactic, the teacher talking and the pupils listening;
- the only resource was the abacus for the youngest children.

In the early 1920, education in general, was beginning to be influenced by the work of Friedrich Froebel, and Margaret and Rachel McMillan. As a brief summary their main thinking suggested:

- the registration of teachers and teacher training;
- various subjects should be taught in close correlation with one another;
- school work should be more practical;
- consideration for the ‘specially bright’ and ‘retarded’ children

### Education in the Early Years:

- for infant and nursery schools it urges the provision for an open air environment affording scope for experiment and exploration;
- the curriculum should be thought of in terms of activity and experience rather than knowledge and facts.
Also in the early 1920s the government of the time established several committees to consider various aspects of the education system. These were chaired by Sir William Henry Hadow, and they published several reports within the period 1923 - 1933. These, often neglected reports, appeared to suggest ideas way ahead of their time. Perhaps that is why they were largely ignored and it is some sixty years later that present governments are suggesting similar ideas. The reports’ suggestions are too numerous to list completely but some of the main findings were:

Whether or not the outbreak of World War II put education into the background is unsure, but little guidance and suggested developments were evident until The Nuffield Mathematics Project was launched in 1964. By then I had moved from being educated myself in school to becoming an educationalist working in schools as a future teacher and a ‘budding’ mathematician. Looking back on my own schooling, on one hand it hadn't quite been like Victorian education, nor on the other hand had I had the advantage of forward thinking and been treated as an individual needing a certain style of teaching. The notion of an empty vessel being filled with knowledge was very much the order of the day.

Suddenly the sight and sound of children enjoying aspects of primary mathematics was common place in many of our schools. However, some schools moved completely away from the ‘formal’ education with the emphasis on number and moved to a totally relaxed curriculum where many children spent their days on often largely irrelevant activities. The balance has swung too far.

In 1967 The Plowden Report, Children and their Primary Schools was published which further developed many of the ideas that had been introduced by Nuffield. There was suddenly a move away from an emphasis on teaching towards the importance of children's learning. Although not specifically a mathematical report, the Plowden Report helped a great amount in developing the shape of mathematics education in the next forty years.

Nuffield Mathematics Project 1964

- Based upon the need to change:
  - the tradition of Victorian mathematics;
  - the age of automation;
  - the changing nature of mathematics;
- Largely based on the work of Jean Piaget and the Chinese proverb;
  I hear, and I forget
  I see and I remember
  I do, and I understand

The Plowden Report 1967
Children and their Primary Schools:

- first real review of primary education in England since the Hadow reports;
- based largely on Piagetian theory;
- emphasis on the need of the individual;
- importance that teachers had freedom with the curriculum;
- build upon children’s intrinsic interest in learning;
- the centrality of play in children’s learning;
- the use of the environment and learning by discovery.
I was by now a 'fully fledged' primary teacher with many new and bright ideas of how mathematics should be learnt and consequently taught. I was sole in charge of the curriculum that I provided for the children in my class. If I didn't fancy teaching mathematics one day no one noticed. How different to the present day where the National Curriculum tells teachers exactly what they must teach in mathematics and more recently the National Numeracy Strategy is attempting to tell them how to teach with the daily mathematics lesson with its oral and mental starter, main activities and plenary session.

Of course, I was responsible to the headteacher, the parents and more importantly to the children for their progress. What I was teaching wasn't radical, it was based upon research and sound educational theory. Politics in the late 1960s and early 1970s had no place in the English primary school. How things were to suddenly change. Repeated governments have begun using education, and our children, for political gain or so it seems. They suddenly became very critical of what they saw as progressive teaching methods. Such methods were also deemed responsible for the decline in standards of social and personal behaviour. They announced that schools (and teachers) needed to be more controlled and directed.

Thus today we have the National Curriculum with its programmes of study and attainment targets. We have national testing of children at the ages of seven, eleven and fourteen. League tables of the schools' results are published in our daily newspapers to help parents decide what school they should send their children to (assuming they have a choice). The National Numeracy Strategy (recently changed to the National Primary Strategy) was introduced to raise standards, particularly of numeracy in its narrowest sense. Remember how the Victorians concentrated on number - it could appear that we have come a full circle. We have more class based teaching - remember the Victorian classroom. What has happened to the ideas and values expressed in the Hadow Report, to the child centred education suggested by Nuffiled and Plowden?

Looking back I do not think I would like to begin my education or my teaching career again, as I'm not at all sure, I could accept what appears to be the interference and direction of repeated governments. Suddenly everyone has become an expert in the field of mathematics education. Naturally I would enjoy using the new technologies to help me in my classroom teaching and of course, the children in their learning. Change isn't always for the better and change for changing sake has no place in our children's education. There are many thousands of good mathematics teachers in our schools that are helping the children develop good attitudes to and confidence in mathematics, as well as their mathematical knowledge and skills. Hopefully future 'developments' will not hinder their progress.

References
Mental arithmetic as a strategy of thought and mathematical communication
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Abstract
The process of learning and teaching mathematics has developed, generally, in a formulaic, perhaps limited path. Concerning mental arithmetic, is it possible to encourage the child to improve reasoning and individual knowledge more? As coordinator at ESE/IPP of a National Program of Teacher Training in primary schools I selected mental arithmetic as a strategy of this process to promote in the class. This idea was well accepted by teachers who began to understand better the program of mathematics and their work in a conceptual, curricular, didactic and human context.

Introduction
The learning and teaching process of operations with whole numbers is described as a reinvention process of the relations between the numbers and the operations. I think that mental arithmetic can improve this abstract “network” inside the class if it is experimented with in the process of training teachers. Thus, in this study, I would like to share my experience in this process of teachers’ training. For such a purpose my presentation has four parts: the first to explain the conceptual and curricular context; the second part to present the experiences in the process of training and professional development over various years; the third for results in the Porto district of the National Program of Training Teachers in primary schools that promote mental arithmetic and, last, some conclusions and reflections.

The design or the trajectory for whole number
Nowadays most researchers in the field of mathematics education consider learning as a constructive process, in an individual and in a social way. Especially, in Realistic Mathematical Education (RME) as was developed over the last thirty years in the Netherlands (Freudenthal, 1973, 1983; Treffers, 1991; Gravemeijer, 1991, 1994, 2000; Drijvers, 2001-2004, 2003) this idea of learning has been constructed as a basic principle of mathematics education in schools. In this perspective the Freudenthal researchers believe that the trajectory of learning and teaching process of whole number is like a follow relationship.

The TAL learning-teaching trajectory for whole number calculation in primary school

- lower grades primary school
  - k1-2, grades 1-2
- upper grades primary school
  - grades 3-6

<table>
<thead>
<tr>
<th>Elementary understanding of numbers</th>
<th>Column calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic up to 20</td>
<td>Algorithm calculation</td>
</tr>
<tr>
<td>Arithmetic up to 100</td>
<td></td>
</tr>
<tr>
<td>and further</td>
<td></td>
</tr>
</tbody>
</table>

Number and number relationships
- Estimation
- Mental arithmetic
The questions of research and historical context
I developed this study oriented by these questions:

- Is mental arithmetic the pivot of this numerical trajectory?
- Is mental arithmetic the connection between the estimation and the algorithm calculation? If it is what can we do to develop, in a deep way, this kind of mathematical knowledge in the student?
- Is it necessary, in the beginning, to promote mental arithmetic or the algorithm calculation or both?

Nevertheless I recognized that it was necessary to study the historical and curricular context of this subject. To promote this content it was clear that depends of pedagogical-didactical vision of mathematics education. So, in Portugal, we had two different historical options for mental arithmetic, as we can see in the follow table.

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>After the algorithm calculation</td>
<td>Before the algorithm calculation</td>
<td></td>
</tr>
<tr>
<td>Trained the exercises</td>
<td>Learned (Discovered) the exercises</td>
<td></td>
</tr>
<tr>
<td>Same strategy</td>
<td>Different strategy</td>
<td></td>
</tr>
<tr>
<td>Similar means of communication</td>
<td>Various means of communication</td>
<td></td>
</tr>
<tr>
<td>Equal representation</td>
<td>Different representation</td>
<td></td>
</tr>
<tr>
<td>Universal knowledge</td>
<td>Individual Knowledge</td>
<td></td>
</tr>
<tr>
<td>+ TEACHING</td>
<td>+ LEARNING</td>
<td></td>
</tr>
</tbody>
</table>

In these two programs we have different orientations about mental arithmetic, as we can analyse. In the Old Manual and Program of Mathematics there was a method to teach mental arithmetic (1958, p. 108): “Suppose we want to add the number 45 with 27. Mentally we need to separate the 45 into 4 tens and 5 units and the 27 into 2 tens and 7 units. The addition starts by tens. We can say 4 tens + 2 tens – 6 tens; 5 units + 7 units – 12 units or 1 ten and 2 units… “. And the Program followed with exercises like these: “Calculate, in the same way that you learn: 42+27; 35+28…” . There were the similar exercises for subtraction and multiplication (p. 113-114; p. 119). In the current Mathematics Program (1990, p. 35) we can read: “In primary school the priority is mental arithmetic. From the beginning the child must use mental arithmetic to obtain a result of an operation. With the mental arithmetic the child can learn:

- to read the number as a structure and not only a symbol of a quantity;
- to apply the proprieties with a practical use;
- to estimate and to have a critical sense of each calculations”.

The historical design of the study and experiments
In 1989 I had responsibility, with three colleagues for the process of training and professional development of 50 teachers that started to promote the new program.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Training teachers in different parts of Portugal</td>
<td>Project “mathematics bad” Training in different centres of formation teachers</td>
<td>National Program (*) (Minister of Education and M. Science, Technologies and Further Teaching)</td>
</tr>
<tr>
<td>Reform</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 teachers</td>
<td>300 teachers</td>
<td>750 teachers</td>
<td>1180 teachers</td>
</tr>
<tr>
<td>Continuity</td>
<td>No continuity</td>
<td>No continuity</td>
<td>Continuity</td>
</tr>
</tbody>
</table>
Some experiments

Exp 1:
I suggested doing this calculation, to reach two goals: (i) to promote the mental arithmetic; (ii) to teach the algorithm of multiplication

25x16=?

Answer 1: Everybody used the algorithm to find the result.

Question 2: Is this the only process to reach the result?

Answer 2: Silence… After some seconds two typical answers appeared: the decomposition of one of the factors and the use of the distributive property of multiplication in relation to the addition.

(i) 25 x 16 = 25 x (10 + 6) = 25 x 10 + 25 x 6 = 250 + 150 = 400
or
(ii) (20 + 5) x 16 = 20 x 16 + 5 x 16 = 320 + 80 = 400

Question 3: What difference? Which of these must I use when teaching the usual algorithm?

Question 4: Are there any other processes to calculate this result?

Answer 3: Silence again… and the teachers reflected for a few minutes…

“What do you mean?” – they asked and concluded: “I don’t know how to do that!”.

Question 4 Reformulated: And if I asked to calculate this result separating one of the factors into a product of factors… Is it easier with this orientation? After some minutes of silence various resolutions appeared.

(iii) 25 x 16 = 5 x 5 x 16 = 5 x 80 = 400

Some teachers said: “It is so fast… I’ve never thought of doing this kind of activity with my students… It is very important to do this with the children… we’ll probably go to prepare them more and better…”

After some reflections I asked to another method and I gave the conditions: we can use only one arithmetical table or two tables. Would you like to try? The teachers thought and various processes of resolution began to appear:

(iv) 25 = 5² e 16=4² → 25 x 16 = 5² x 4² = 20² = 400
(v) 25 = 100/4 → 25 x 16 = 100/4 x 16 = 16/4 x 100 = 400
… and closes calculations to another that we know:
Thus we know the result of $25 \times 16 = 400$
Examples: $25 \times 17 = 400 + 25 = 425$
$25 \times 18 = 400 + 50 = 450$
$25 \times 19 = 400 + 75 = 475$
...
$24 \times 16 = 400 - 16 = 400 - 15 - 1 = 385 - 1 = 384$
...

Another experiments happened with different proprieties

Exp2: Subtraction

What is the fast and efficient process to calculate this subtraction?

$$38746 - 17998 = ?$$

All of the teachers used the algorithm, but after we discussed the principal propriety of the subtraction they could use it. They discovered the fast way to reach the result in this example.

$$38746 - 17998 = 38748 - 18000 = 20748$$

Exp 3: Algebraic Propriety

After, I proposed to apply the algebraic knowledge in a significant example. I asked to calculate the follow operation in an efficient and clever process

$$21 \times 19 = ?$$

They had some doubts, but after an important discussing some teachers applied the important algebraic propriety in a utile sense, because they could to reach the result in a fast way and to understand better that expression.

$$21 \times 19 = 20^2 - 1 = 400 - 1 = 399$$

The algebraic propriety

$$(n + 1) (n - 1) = n^2 - 1$$

The Program in School (ESE) - Results
In this part I completed a report towards of the questionnaire, about mental arithmetic, that was applied to the teachers that participated in this National Mathematics’ Program. I analyzed 70 answers (10% of the teachers in formation) and some questions.

Mental Arithmetic
1. Frequency used in the class during formation

<table>
<thead>
<tr>
<th>One</th>
<th>Two</th>
<th>Three or more times a week (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>time a week</td>
<td>times a week</td>
<td>or more times a week (*)</td>
</tr>
<tr>
<td>4</td>
<td>11</td>
<td>55</td>
</tr>
<tr>
<td>5%</td>
<td>16%</td>
<td>79%</td>
</tr>
</tbody>
</table>

(*) Some teachers said that now they practice daily mental arithmetic, during five or ten minutes.

2. Why do you now develop this subject?
The teachers presented reasons to the students and to the teachers
**Principal Reasons – for the students**

<table>
<thead>
<tr>
<th>Reason</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>To develop the reasoning – more agility and quickness</td>
<td>20</td>
<td>29%</td>
</tr>
<tr>
<td>To understand better the numerical system and the proprieties</td>
<td>18</td>
<td>26%</td>
</tr>
<tr>
<td>To improve mental arithmetic in the daily life</td>
<td>17</td>
<td>24%</td>
</tr>
<tr>
<td>To understand, in a deep way, the cognitive structure</td>
<td>5</td>
<td>7%</td>
</tr>
<tr>
<td>To develop mathematics communication</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>To create more beliefs to think and confidence to share</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>To stimulate the problem solving process and solve operations</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>To develop early as the first recourse, before the algorithm</td>
<td>4</td>
<td>6%</td>
</tr>
<tr>
<td>To learn for have more autonomy</td>
<td>3</td>
<td>4%</td>
</tr>
<tr>
<td>To promote more personal strategy for calculation</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>To consolidate the numerical knowledge</td>
<td>2</td>
<td>3%</td>
</tr>
<tr>
<td>To develop the critical sense</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>To improve the knowledge number structure</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Principal Reasons – for the teachers**

- To open perspectives about mathematics and how to teach this discipline.
- To improve and reflect more about the daily work class in the mathematics.
- To learn more mathematics and how to teach better in the class.

3. **Why you didn’t practice this subject before?**

The teachers defended two principal reasons:

- “I never study this subject, in initial and continuum process of my training and development professional.”
- “It is unforeseen in the textbooks”.

**Conclusions and reflections**

We must conclude that there is yet some confusion between the algorithm calculation and the mental arithmetic. Maria del Cármen Chamorro (2005) in *Didáctica de las Matemáticas* say that the mental arithmetic is more usual in daily life and generally it is not applied in the mathematics classes. Chamorro (2005) suggested significant different (p. 179).

<table>
<thead>
<tr>
<th>Automatic calculation written</th>
<th>Mental arithmetic (thought)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is general.</td>
<td>Is particular.</td>
</tr>
<tr>
<td>Only one technique for a couple numbers.</td>
<td>Various strategies for a couple numbers.</td>
</tr>
<tr>
<td>The technique is the same for each operation.</td>
<td>The process change.</td>
</tr>
<tr>
<td>Is the same for all people.</td>
<td>Is different for the people.</td>
</tr>
<tr>
<td>Use inside the proprieties.</td>
<td>Use outside and explicit the proprieties for each situation.</td>
</tr>
<tr>
<td>Is used the memory.</td>
<td>Is used a mental structure.</td>
</tr>
<tr>
<td>The errors are difficult to detect and correct.</td>
<td>There is a constant check for errors.</td>
</tr>
</tbody>
</table>

This table suggests that we need to reflect more about this subject. Nevertheless, it is possible to have more conclusions than which we had at the beginning of this study. So, we can write that there are some
advantages in using mental arithmetic in the class, because of the variability of calculation strategy the student can:

- to think freely and not be limited to a single process;
- to communicate mathematically in a different way;
- to consolidate processes and knowledge with implicit application of properties;
- to humanize the mathematics with the educative dialogue of interpersonal form, learning from listening to others;
- to promote internalisation and the understanding of the concepts, for met cognitive processes of thought, stimulating the neurones.

There is a significant aim when we develop mental arithmetic that is the personal and social dimension, as certainly way, Ausubel, 1963; Adler, 1968; Bruner, 1983-1990; Vygotsky, 1979, defend in the education. By the process of learning the whole number and the operations it is important:

- to develop the student as an individual
- to stimulate the mind and the reasoning more
- to improve the mental game
- to promote thought and communication

There we must not format the person at the beginning of development. Nevertheless, the study is continuing and we may discover other reasons to develop mental arithmetic in the elementary class.

References


Brain functioning: Simultaneous and successive processing

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Introduction
The investigation reported here examined the use of manipulative materials to teach mathematics, in the context of a specific model of brain functioning. In the 1950s and 1960s there was an increased interest in the use of manipulative materials in teaching mathematics. During the 1960s and into much of the 1970s it was something of a mantra that effective teaching of mathematics required the use of concrete materials. Throughout the 1980s, as government interventions into education grew, and as researchers continued to produce equivocal findings, there was a movement away from Cuisenaire Rods and Dienes’ Multibased Arithmetic Blocks (MABs). However, from the early 1990s educational psychologists developed models of brain functioning, and cognitive scientists investigated machine learning to better understand the limits of intelligent information technologies. Their research has built a more effective picture of human brain functioning: so at a time when the mathematics education community appeared to be losing interest in the use of manipulative materials, other research communities were establishing knowledge that could explain their effectiveness.

Simultaneous and successive processing
Simultaneous processing refers to the brain taking in sequential data and applying all these data at the same time, for example, in perception, when problem solving, reading a map, and in written expression. Successive processing refers to the brain taking in sequential data and applying these data one after the other, for example, when handwriting, in playing musical notes, when learning to drive, in do-it-yourself activities. Every individual uses both simultaneous and successive processing. Further, what is initially successive processing, such as reading a passage, or playing the piano, or learning to drive, where each element has to be focused on carefully, one at a time and in the correct order may become simultaneous processing following practice which increases the skill of the reader, piano player or driver, and through chunking, which reduces the demands on short-term memory as the task becomes automatised. The initial choice of simultaneous or successive processing depends on the individual’s information processing preferences, any special insight or expertise, and the task at hand.

Background
Following his extensive clinical work with brain damaged children the Russian psychologist, Luria, hypothesised that individuals processed information in two principal ways: which he referred to as simultaneous and successive processing (Luria, 1966, 1970, 1973). A body of literature over several decades confirms the existence of simultaneous and successive processing, no longer concerned with clinical data but with large, random samples and factor analysis (Das, 1988; Das, Kirby & Jarman, 1979; Das, Naglieri & Kirby, 1994; Das & Molloy, 1975; Kirby, 1992; Kirby & Das, 1977; Kirby & Robinson, 1987; Naglieri, Braden & Warwick, 1991; Naglieri & Das, 1988). Additional research has focused on:

- learning disabilities, often in the context of learning to read: much researched, including Kirby & Das (1977), then at decade intervals Kirby & Robinson (1987), Aysto (1998) and Van Luit, Kroesbergen, & Naglieri (2005);
- learning map reading: little researched (Sutherland & Wind, 1987);
- learning electronics: little researched (Winn, 1986); and

There are many questions that come from this lack of sustained research into mathematics learning. For example, we cannot be certain if one or both of simultaneous processing or successive processing are important in mathematics achievement. There are many research questions that could be investigated, but the present work investigated: the relationship between levels of simultaneous and successive processing, and achievement in subtraction algorithms and word problems.
Method
The research design involved the identification of students’ cognitive styles and a comparison of these
stYLES with learning outcomes in mathematics. While some qualitative data were gathered through
Interviews, these data were used to provide more detailed insights into what was a statistical analysis: this
is a post-positivist paradigm.

Sample
120 grade 5 students were assigned randomly to one of three classes in each of two suburban schools.

The simultaneous/Successive Instrument
A six component test administered to class-size groups provided measures of simultaneous and successive
processing; including tests where students had to recall lists containing from two to nine numbers, letters
or words; and tests associated with creating shapes from smaller shapes or patterns. A principal
components analysis confirmed the presence of two factors: which, following the literature, were labeled
as simultaneous and successive. Those students whose scores were on or above the mean were considered
to be “high level processors”, those below the mean “low level processors”. Every student was then
assigned to a group: the high simultaneous and high successive processors group (HH), and similarly, the
high simultaneous-low successive processors group (HL), the low simultaneous-high successive
processors group (LH), and the low simultaneous-low successive processors group (LL).

Mathematics tests
The arithmetic test contained written subtraction algorithms and word problems, typical of those taught in
primary schools. There were parallel versions for the pretest, the posttest (after four weeks teaching) and
the retention test (four weeks after the completion of teaching).

Interviews
Interviews were conducted with 25% of the sample, using a stratified random sampling technique to
ensure equal representation from each of the four groups. The interviews were held immediately after the
posttest, and again following the retention test. During the interviews, lasting from ten to twenty minutes,
students completed subtraction algorithms and word problems: the interviews were recorded and
transcribed.

Results
Test scores
The data in Table 1 show the adjusted mean scores following a multivariate analysis of covariance. For
example, we can see that the score on the algorithm component of the retention test, for high
simultaneous-high successive processing students was 74.0, and that the HH group consistently outscored
other groups.

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Algorithm post</th>
<th>Algorithm retention</th>
<th>Problem solving post</th>
<th>Problem solving retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH</td>
<td>77.4</td>
<td>74.0</td>
<td>21.0</td>
<td>19.9</td>
</tr>
<tr>
<td>HL</td>
<td>73.3</td>
<td>73.0</td>
<td>19.9</td>
<td>19.6</td>
</tr>
<tr>
<td>LH</td>
<td>70.0</td>
<td>66.5</td>
<td>18.1</td>
<td>16.4</td>
</tr>
<tr>
<td>LL</td>
<td>65.9</td>
<td>65.6</td>
<td>17.0</td>
<td>16.0</td>
</tr>
</tbody>
</table>

The scores of the high simultaneous-high successive processing students were contrasted with scores of
the low simultaneous-low successive processing students using a multivariate analysis of covariance
(MANCOVA), where simultaneous and successive processing were the independent variables,
subtraction posttest and retention tests scores the dependent variables, and with subtraction pretest scores
the covariate (refer to Table 2, in the section headed "multivariate, HH v LL"). There are no significant
differences between scores on subtraction tests by these two groups of students (F = 1.3980, p = .244). At
the same time, the stepdown analysis suggested that the two groups differed in their scores on the
algorithm component of the posttest (F = 4.0503, p = .048), with the high simultaneous-high successive
group averaging 77.4, and the low simultaneous-low successive group averaging 65.9. This lends some
support to the notion that at least one of simultaneous or successive processing are required for successful completion of arithmetic algorithms.

### Table 2: Multivariate analysis of covariance

<table>
<thead>
<tr>
<th>Sim/succ contrasts</th>
<th>Wilks' lambda</th>
<th>Hypoth df</th>
<th>Error df</th>
<th>F</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multivariate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HH v LL</td>
<td>.9240</td>
<td>4</td>
<td>68</td>
<td>1.3980</td>
<td>.244</td>
</tr>
<tr>
<td><strong>Associated Stepdown</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post algorithm</td>
<td></td>
<td></td>
<td></td>
<td>.40505</td>
<td>.048</td>
</tr>
<tr>
<td>Post problem solv</td>
<td>1</td>
<td>71</td>
<td>69</td>
<td>.6596</td>
<td>.419</td>
</tr>
<tr>
<td>Retention algorithm</td>
<td>1</td>
<td>69</td>
<td>68</td>
<td>.0593</td>
<td>.808</td>
</tr>
<tr>
<td>Retention prob solv</td>
<td>1</td>
<td>68</td>
<td>68</td>
<td>.9112</td>
<td>.343</td>
</tr>
</tbody>
</table>

| Multivariate         | .9727         | 4         | 68       | .4777  | .752  |
| **Associated Stepdown** |             |           |          |        |       |
| Post algorithm       | 1             | 71        | 69       | .3444  | .559  |
| Post problem solv    | 1             | 70        | 69       | .3128  | .578  |
| Retention algorithm  | 1             | 69        | 68       | .2463  | .621  |
| Retention prob solv  | 1             | 68        | 68       | 1.0174 | .317  |

A MANCOVA was conducted where the high simultaneous-low successive processing students were contrasted with low simultaneous-high successive processing students (refer to the lower half of Table 2, "multivariate, HL v LH"). There were no statistical differences in subtraction test scores between high simultaneous-low successive processing students and low simultaneous-high successive processing students (F = .4777, \( p = .752 \)). These data do not assist any argument concerning the importance of simultaneous processing compared with the importance of successive processing in the successful completion of subtraction algorithms.

The possibility that simultaneous and successive processing both impact on mathematical learning, but in differing ways, has a precedent in language learning. Kirby and Robinson (1987) argued that reading skills required both decoding (successive processing) and comprehension (simultaneous processing). There may be an analogy in the completion of arithmetic algorithms: successive processing may be required to complete the algorithm correctly, but simultaneous processing may be required to understand the structure of the algorithm. Simultaneous processing may be necessary for understanding why rather than how, and for the development of relational rather than instrumental understanding. Consequently, successive processing may lead to a correct answer, but it may be simultaneous processing that is the more truly mathematical activity. The interview data may help to clarify this point.

**Interviews**

1 **high simultaneous and high successive**

Laura is a high simultaneous-high successive cognitive processor. The transcript shows her completing the written algorithm 653-472 during the posttest interview. It indicated she had high procedural knowledge. She was able to describe the process of completing the algorithm briefly and accurately, identifying all the important aspects. That is, she recognised the need to trade, decomposed correctly and writes the algorithm procedures correctly. This appeared to be a reflection of her high successive processing ability. She also gave reasons for these steps, and explained why she did a particular thing and not anything else. That is, she recognised mathematical relationships, and in her interview provided extended explanations on various components of the algorithm, without requiring any prompting. This seems to mean she had a relational understanding of the algorithm sequence, and the interrelatedness of all its components: qualities made possible by her high simultaneous processing.
What about that one?
S: Three take away two is one. Five take away seven you can't do so you trade, five, fifteen; fifteen take away seven is eight and five take away four is one.

Good. Why did you have to trade?
Because five is less than seven.
When you traded you crossed that out. Why did you cross that out?
So I could put the five at the top and put the ten from there and make fifteen.
So why is that five and not four or three or two or something else?
Because the next number down from six is five.

2 high simultaneous and low successive

In this transcript, Trent (high simultaneous-low successive) was able to correctly complete the algorithm 746 - 382. He traded as was required, and explained you cross out the seven and add a six on the top and then put a one next to the four. This was a procedural explanation, so the researcher asks why, and Trent replies Because you have taken one from that and given the one to the tens, which has some hint at mathematical relationships.

That's fine. Now let's try this.
Okay good Trent, why did you cross that out?
Because four take away eight you can't do.
So what do you do?
You cross out the seven and add a six on the top and then put a one next to the four.
Why did you write six there? Why don't you write five or nine or something like that?
Because you have taken one from that and given the one to the tens.

Trent appears to have no difficulty in decomposing across a zero with MABs. This probably implied confidence in the use of materials, but more importantly an understanding of the materials, the relationship between the different blocks and the manner in which they were used to represent mathematical constructs. That is, Trent's use of the MAB here was likely to reflect his high simultaneous processing capacity. At the same time he continued to say things such as you can't take zero away from four, which indicated he still had problems with the procedural aspects of subtraction algorithms, and which I take to mean reflects his low level successive processing. The interview continued:

Good. Now what if I asked you to do that one except I want you to use the MABs.
Now tell me, what is it you are trying to do? What have you got there?
Three hundred and two and one hundred and forty-five.
All right take me through it and see if you can do the subtraction.
Now stop for a second and tell me exactly what you have done so far.
You can't take two away from five and you can't take zero away from four so I took out a hundred and traded it for ten tens and then traded one ten for ten units.

Now if you were to write down here what you've got there, what would you write down?
I would cross out the three, then add a two, then make it twelve and twelve take away five.
Hold on, what about this? Does this say what you have got there? Is this what you have got there?
No. What else is there then?
Nine tens.

Trent recognised the need to trade a hundred for tens, one of which he traded immediately for units. He had decomposed sufficiently so that he could subtract: his high level simultaneous processing capacity...
that allows this invention. It appears that if he has to solve a number problem, he worked quite well with MABs, but he seemed not to have automatised this procedure. Moreover, he may regard working with MABs as a problem solving activity; seeing each question as a novel problem. His solutions to these problems would be assisted by his high level simultaneous processing. He has two difficulties here: the one related to a lack of automatisation of the MAB procedure; and the other related to his inability to deal with written algorithms efficiently. Students like Trent, even though they give the correct description for using MAB materials, may not actually put that description into practice. This is a consequence of their low level successive processing, and account for their lack of automatisation in both the written algorithm and in MAB procedures.

3 low simultaneous and high successive
Marie (low simultaneous-high successive) had considerable ability with written algorithms: she completed written algorithms correctly, including three digit subtractions with trading. At the retention interview Marie completed the written algorithm 651-293 correctly. She was an effective solver of written algorithms because she had high level successive processing allowing her to automatisate the procedure.

R: Now can you tell me out loud how you did it?
S: One take away three you can't do, because the one is smaller than three, so you go over to the five and cross that out and you say that is four. Then you take the one ten and you take it over to the one and make it eleven. And then eleven take away three is eight and then four take away nine you can't do it. So you cross out the six, take one ten and make that fourteen; fourteen take away nine is six and five take away two is three.

R: Good. Now can you tell me (pointing) where the five is crossed out. Why did you cross the five out?
S: I had to cross that out because the five (pause)... I had to take one ten from the five to make the one unit.

Here she stated the whole, correct procedure for 651-293, in one long uninterrupted and non-prompted description. At the same time, she did not use correct place value, referring to one ten instead of ten tens, and her explanation was procedural. That is, she seemed to be saying you do it because you have to, because that's the way to get the correct answer. Her explanation made no reference to mathematical relationships. Low simultaneous-high successive processors were likely to have automatised written procedures. They do well in mathematics tests provided they remember learned procedures. They were unable to establish relationships between MAB materials, their actions on them, and written algorithms.

4 low simultaneous and low successive
David (low simultaneous-low successive) scored a little below average on the various mathematics tests. In the pretest algorithms, he frequently subtracted the smaller digit from the larger. In later tests, this strategy was less frequent, but within adjacent algorithms he would answer one using a correct procedure, and in the next revert to his smaller digit from the larger strategy.

In 547-169 it seems that David had a good understanding of the procedure: he recognised the need to trade, carried out the correct written actions and obtained the correct answer. However, when asked to explain why the 5 hundreds became 4 hundreds, and not some other number, there was a delay before he responded: because the four goes there. This was not an explanation, but reference to a rule or statement. It almost certainly indicated that even though David was able to recall and identify the correct instance of trade, he had little meaning of the concept beyond the written action. He was asked to repeat the question, using MABs.
Now I want you to use the equipment to do this (547-169) and as you use the equipment I want you to write down what you are doing. Do you know what I mean?
Can you tell me what you are doing?
There are four tens.
I’m getting 5 tens, 4 tens and 7 tens.
Now can you tell me what that number says?
Five hundred and forty-seven.

| Now I want you to use the equipment to do this (547-169) and as you use the equipment I want you to write down what you are doing. Do you know what I mean? | Works with equipment. |
| Can you tell me what you are doing? | Takes tens from box, counts out 5 tens. |
| There are four tens. | Incorrect, ignores place value. |
| I’m getting 5 tens, 4 tens and 7 tens. | But has used tens to represent all digits. |
| Now can you tell me what that number says? | 5 hundreds in question. |
| Five hundred and forty-seven. | Has five tens. |

So what is that five? Five what?
Five hundred.

What have you got?

(pause)

Five hundred.

Have you? Now what does that four say?
Four tens.

How many have you got there?

Four.

Now what is different between that four and that five?

(pause)

Uncertainty

The first problem here is that David used MAB materials as counters, 5 to represent 500, 4 to represent 40 and 7 to represent 7: but it was not as simple as that. This incident also suggested that he had little knowledge of the materials and how they related to algorithms, and little conceptualisation of what his actions on them meant.

**Further discussion**

Following a series of tests students classified as high simultaneous-high successive were found to have the best scores on both algorithms and problem solving, both in the posttest and in the retention test. These students appear to have the advantage of being able to use their simultaneous processing to understand the role of the manipulative materials and the mathematics they represent. They appear also to be able to link the actions on the materials to the written algorithm. In the absence of the materials they are able to complete algorithms correctly because they have high level successive processing; and if they become confused they are able to recall actions on the materials to re-focus their written algorithm. They have a mathematical language which is rich in elaborations, relationships and understandings.

Students classified as high simultaneous-low successive were able to solve algorithms and problems using manipulatives because they understood the relationships within and between the parts of the manipulatives. However, their low successive processing meant they were sometimes not successful in using the materials in the most efficient manner, and at times made errors in the written algorithm. They had difficulty in operationalising and automatising the sequences. In a sense they understood what was required, and they knew what to do, but their low successive processing led them to make errors in applying these understandings.

Students classified as low simultaneous-high successive processors could sometimes use the MAB materials to complete algorithms and word problems. Their strength was in being able to complete written algorithms well. These outcomes may be explained by their high level successive processing. That is, they knew the sequence of both the MAB and the written procedures. However, they sometimes were unable to solve questions using MAB because they had forgotten the procedure: in the case of written algorithms, they relied entirely on memory and automatisation. They appeared not to have insights into the mathematics they were performing. If they made an error they did not have sufficient understanding to reason a solution to the error. An especially important interpretation here is that low simultaneous processors appear unable to see the relationship between the MAB manipulation and the written algorithm. In effect, such students seem to separate written algorithms from actions on MAB, as though the two were unrelated.

In the case of low simultaneous-low successive students, their low level successive processing meant they were inconsistent in their procedures, adopting correct procedures at times, but incorrect procedures at
other times. The typical low simultaneous-low successive processors had declarative knowledge, but lacked procedural knowledge. That is, they made procedural errors on a regular basis because they generally had not been able to automatise the procedure: they had difficulty with the how when it came to solving algorithms. Further, their lack of simultaneous processing capability made it problematic for them to understand why algorithms were structured and completed in the way they were. These students generally were unable to see any mathematical relationships that linked actions on MABs with written algorithms. They were not likely to recognise and correct errors, and their language was narrow and unlinked, generally they made no elaborations and described no relationships.

The claims made here may need to be qualified in the light of the few findings of statistical importance in the quantitative data. However, the text data provided insights that justify the claims. On the one hand I can say the usual “more research is needed”, but there are important implications for professional practice in these findings. In particular, some pupils will thrive on the use of manipulative materials in classrooms, but others will need additional support to make the link between actions with materials and the written version of an algorithm. And it has to be acknowledging that not all pupils will understand the link, and that not all pupils will gain from the use of such materials.

Conclusion
The research reported here set out to investigate if there was any relationship between the use of manipulative materials in learning mathematics and students’ cognitive processing, particularly as these two variables impacted on learning to solve subtraction algorithms and word problems. The findings suggested that simultaneous processing was important to understanding mathematical concepts and that successive processing was important in remembering arithmetic procedures. The findings indicated that manipulative materials will not benefit all learners, and that to benefit the maximum number of students a teacher will have to take care in supporting students’ use of materials and making links to the written algorithm. Any abandonment of manipulative materials as part of the learning process is likely to be premature and unjustified: but the 1960s and 1970s belief that such materials are essential for learning cannot be sustained.

References


Some reflections on a major change on teacher formation in Portugal
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Introduction
In this presentation I will report on the present situation in Portugal concerning preschool educators and primary teachers training, focusing on the discipline of mathematics. Then I will report on a major change these courses have been submitted to, by government push and following very precise orientations centrally determined. In general terms this will mean more mathematics and more Portuguese language and less educational sciences. Some reflections will be presented in the end.

Present situation
We will consider here the present situation in Portugal concerning teacher training for children aged three to twelve. Teachers for these children will be preschool educators (for children aged 3 to 6), 1st cycle of basic school teachers (for children aged 6 to 10) and 2nd cycle of basic school teachers (for children aged 10 to 12). At present time, pre-service teacher training is different for preschool educators, for 1st cycle teachers and for 2nd cycle teachers. On their initial training, preschool educators have fewer disciplines on mathematics and sciences than teachers of the 1st cycle of basic school (first four grades), and these have less than teachers of the 2nd cycle of basic school (5th and 6th grades). These teachers of the 2nd cycle are teachers of just mathematics and sciences (or of course of one other pair of disciplines). Teachers of the 1st cycle and preschool educators are called generalist teachers, however preschool educators have more disciplines on general educational sciences on their initial training. In more specific terms, future preschool educators have, during pre-service training, a mathematics study consisting of two disciplines on mathematics and one discipline of didactics of mathematics. These three disciplines represent about 5.5% of a four-year course. Considering that the total amount of ECTS for the whole course is 240 ECTS, these three disciplines consist of about 7.2 ECTS.

As to the 1st cycle future teachers, their pre-service training has a mathematics study consisting of three disciplines of mathematics and three disciplines of didactics of mathematics. These disciplines represent about 10% of a four-year course, which means about 24 ECTS. Finally, for the 2nd cycle teachers, who are teachers of just two disciplines on the 5th and 6th grades (e.g. mathematics and sciences) the situation of their pre-service training is different. They have either approximately 18% (about 43 ECTS) of their teacher training course (also a four-year course) on each of the disciplines or double that (about 86 ECTS) on just one and almost nothing on the other. This ambiguity on their training is reflected on actual practice in schools. In fact, in actual practice, most of them will be teaching just one of the disciplines.

Future situation
During this last eight months, all institutions devoted to teacher training have been busy adapting their courses to the new model according to the process of Bologna. In Portugal, general rules allowed either a model 3+2+3 or 4+1+3 for the entire university formation from initial graduation until Ph. D. completion. But for teacher training, the ministry of Education has provided comprehensive guidelines for the structure. It is these guidelines that teacher training institutions have to follow, with little room to divergence. The focus on this presentation will continue to be teacher training for children aged three to twelve.

For a start, there will be a totally new three year course, standard for preschool educators, 1st and 2nd cycle teachers, as preparation for the master courses that will provide teaching permit. This is similar to other levels' teacher training, since for them the first degree will be on the subject they want to be teachers of. One novelty of the new scheme is that there will be master courses that will allow for new teachers that may teach both on 1st and 2nd cycle or on the 1st cycle and preschool education. There will also be master courses that will continue to prepare just for preschool education and just for the 1st cycle of basic school. However, it is my opinion that the latter will become standard, since the benefits will be considerably superior, with only half semester more of personal investment. Therefore, only the combination of first degree and master course leading to preschool education and 1st cycle of basic teaching and leading to 1st cycle and 2nd cycle of basic teaching will be analysed further.

Teacher training for preschool educators and 1st cycle of basic school teachers will consist of a three-year course followed by a one year and a half master course. Considering the whole, but focusing on mathematics and mathematics education, the school I belong to will offer a total of 6 disciplines on
mathematics and 2 disciplines on didactics of mathematics (which is 15% of a four and an half year course, and that is about 40ECTS). Ministry of Education guidelines impose certain minimums and that means that other schools may offer a different number of disciplines but the total amount cannot be far from the one set above.

Teacher training for 1st cycle and 2nd cycle of basic school teachers will consist of the same three-year course followed by a two-year master course. In this case, the school I belong to will offer 7 disciplines on mathematics and 2 disciplines on didactics of mathematics (which is 15% of a five-year course, and that is about 45 ECTS). It is also worthy to note that apart from this, there will be an intervention of the mathematics group on the disciplines connected with pedagogical practice in schools. Therefore the total amount of time devoted to mathematics has to be considered superior to the one set above, but being this extra time on an integrated basis, it is not breakable into numbers and percentages.

Future situation compared with present situation and some reflections
This last section will highlight differences between the present situation and the future situation, reflecting on them from different points of view. Let us start with a first fact: preschool educators will have a dramatic increment (from 7.2% to 40%) on the percentage of time dedicated to their mathematical studies. But it remains to be seen if that increment, especially such a dramatic one, is really needed. Do those that do not want to be teachers of the 1st cycle of basic school really need such a high percentage? And considering the low popularity mathematics suffers from, will preschool education remain as popular among those that enjoy working with small children? Will we witness in a few years preschool educators trying to turn preschool setting into a school setting? Or will we then see teachers that adapt differently their teaching style and setting when teaching three years old and 10 years old? And of course what will happen when the first teacher gets a group of children from their three to their ten? Seven years of contact with a group of children in such an influential period will be tantamount.

Second fact: 1st cycle teachers will have an increase on the time dedicated to mathematics (from 24 to 40 or 45 ECTS) and at the same time they will be able to teach in preschool or in the 2nd cycle, becoming the most important segment on the basic education. But maybe it will be an implicitly wrong message, because they (as a class) will be seen as the victors on the process. And as they say in football, in a winner team we make no changes, therefore they won’t perhaps be willing to change their practice. But of course the fact they will have double the mathematics preparation is positive and will certainly become a factor in children’ mathematical learning.

Third fact: clearly those that will be seen as losers (as a class) are the 2nd cycle teachers despite being the ones with, in theory, a better scientific training. But then the implicit message may be seen as confusing. For preschool educators it is “More mathematics is needed”, for 2nd cycle teachers it is “You don’t need that much mathematics and therefore you don’t need to be a specialist teacher”. Of course it may be that their present mathematical training is not the most adequate, since it includes algebra and analysis.

Fourth fact: To be a preschool educator or a 1st cycle there will be need, from now on, of an investment in sciences and mathematics. But currently teachers at these levels have weak capacities on these areas sometimes very weak capacities. Now in comparison we are asking for good students on these areas. And so, will this profession remain as attractive as it has been until now? This is of course something that will not worry in the near future, because we have a surplus of qualified teachers. But in five years it may be a problem if the profession really appears to become less attractive.

Fifth fact: for a considerable number of years there will be two kind of teachers in schools. Those that have had a weak scientific preparation and those new teachers, ‘highly’ scientifically prepared. More than that, those ‘highly’ scientifically prepared will have to pass an examination to become teachers; and they risk being unemployed for some time because of the decline of birth rate. But... Is there justice? Will they think.

Sixth fact: The ministry of education has issued very clear and tight specifications on the amount of mathematics but of course not on what mathematics. So... How will institutions interpret the mathematics to include? And will the differences between institutions be great or just of kind? This is a central point. If we just include more mathematics, as it has been done in other occasions in the past, then perhaps the whole point of these new courses will be lost. I think that what is required is more time devoted to more or less the same mathematics, not really more mathematics (although that may be so for a few topics).
Teachers on these elementary levels should have a deep knowledge of elementary mathematics, not a superficial knowledge of many topics of mathematics (Ma, 1999). They should be able to connect their knowledge not only within mathematics itself, which is already a very important competence, but with knowledge from other areas, and also with situations where such knowledge is imbedded, what Shulman (1986) called the pedagogical content knowledge. And of course they should know very well what are the main epistemological obstacles for children at different age levels, as discussed by Brousseau (1997). If we manage to instruct future teachers in such a way, we can make a difference on teaching and learning on the lower levels, building a strong foundation for the educational system as a whole. So we have, as mathematics educators a real responsibility, and an opportunity.

**Conclusion**

This is a time of great changes for mathematics educators for the lower levels of schooling in Portugal. It is a time of opportunities but also of preoccupation. But it is also a time when we can make a difference, by investing on the design of robust teacher training courses. One problem with changes in education is that there may be a tendency to return to the same point where the change has begun. That will happen if the change is perceived to be leading to a worst scenario, even if in fact it is not. Perception, general perception, is powerful, and we as mathematics educators have a responsibility to influence general perception in such a way that changes will remain in the future. After all these changes are made in the direction we want to turn Portugal into a more developed country, where science, especially mathematics, is considered in a more positive way.

**References**


Empowering mathematics educators with instructional improvement seminars
Robin Rufatto
Ball State University

Most people have heard the pros and cons of President George W. Bush’s No Child Left Behind law, which, among other things, mandates standards of performance in schools in the United States. However, mandating and testing standards does not guarantee success at the university level. One of the reasons for this might be that secondary school teachers and college faculty have different expectations for these students. According to the ACT National Curriculum Survey (2007), when asked what was most important for students to learn, the responses given by these two groups differed widely. For instance, in English and writing, more than 35 % of college faculty stated that basic grammar and usage were highly important. Of the high school teachers surveyed, only 10% agreed. What then did the high school teachers find important? In their opinion writing an effective introduction and conclusion were most important. In science high school teachers rated factual knowledge more important than process. College professors said the most important skill students could bring to their classrooms was process and inquiry skills. In our area of mathematics education, high school teachers put more emphasis on advanced material, while college instructors wanted students to have “a rigorous understanding of fundamentals”. Fifty-five percent of college faculty placed basic operations and applications as the most important skills while only 40% of high school teachers placed it there. Why is there such a difference in expectations? Perhaps William Tate, president-elect of the American Educational Research Association, put it best when he said “We have a separation in that some of us who do the research aren’t running the schools.” (Toppo, 2007)

Not only are the researchers not running the schools, many times they aren’t even communicating with each other! Faculty members of mathematical sciences departments seem to be divided into two groups, mathematics education researchers and teaching mathematicians. Although there are major differences in the ways these two groups perceive themselves, both are actively concerned about the effectiveness of the teaching and learning of mathematics (Banchoff, Salem, 2002). This paper will introduce a third group of educators and will describe inter-departmental seminars which are focused on instructional strategies that any and all mathematics educators can use to improve their teaching.

These seminars have been conducted in the Department of Mathematical Sciences at Ball State University, which is a state-assisted university of approximately 20,000 undergraduate and graduate students located in a Midwestern city in the United States. There are currently over 220 undergraduate majors in the math department and 45 graduate students majoring in one of the mathematical sciences. Nearly half of these students are studying Actuarial Science, while another 85 are secondary education majors. The largest group of students, at least 3500 each semester, is not made up of math majors but of those students who are required to take a math class for their major, six hundred of whom are elementary education majors. To teach these students the math department employs 50 full- and part-time faculty members. The full-time faculty currently consists of 21 tenure-line faculty and 15 contract faculty. The mathematics education researchers and teaching mathematicians are the tenure-line faculty. The contract faculty members do not really fit into either of these categories. They have been hired to teach and to provide service to the department and university. There are no research or publication requirements for these 15 people, although both research and publication are encouraged. Neither is there any job security since the longest contract which is granted is for three years, and only a limited number of these multi-year contracts are granted each year.

On a recently distributed survey of the department’s faculty the majority of the thirty-eight percent of the faculty who responded indicated that their most important job requirement was teaching. When asked how they sought to improve their teaching skills, the responses were quite varied. The methods used included attending professional meetings, reading journals, keeping abreast of technology changes, critically analyzing peer and student evaluations, and, the most frequently stated, discussing teaching and learning with colleagues from across campus as well as within the department.

Perhaps one reason that collegiate discussion was the most frequently listed method for improving teaching is that there are currently two series of seminars on teaching offered within the Ball State math department. Both of these seminars will be described in this paper. The seminar which I began in the Fall Semester of 2005 is called a Brown Bag Discussion Group on Teaching and Learning. This group meets twice a month to discuss previously distributed articles on teaching and learning. This forum also provides a platform for faculty to share what they have learned at conferences or to ask for advice about
The discussion at the Math Ed. Colloquium is equally lively, with most participants feeling free to express themselves. Since this group has stayed quite focused, the discussion has mainly centered on how students learn as well as on what educators can do in the classroom to facilitate that learning. The book discussion ended several weeks ago. Since the leaders of this colloquium are tenure faculty and have the power to affect change in the department, this same group of people is now using what they've learned from that discussion to create a common structure for teaching and assessing the first two courses. The required math courses for elementary education majors.  The first course covers number theory, algebra and probability, while the second course covers data analysis, geometry and measurement.  The initial schedule called for the colloquium to cover one chapter each week, but several discussions took two sessions. These sessions have been very structured with the discussion staying on topic. The people attending this seminar were tenure-line faculty, contract faculty, and graduate students.

These two seminars have evolved quite differently. The Brown Bag discussions have remained relaxed yet informative. Since the participants of the Brown Bag Discussion Group are contract faculty members, their peers are also contract faculty members who have little or no influence in the department as a whole. Therefore no major changes in the structure or operation of the department have come from this group. However those who attend regularly are evolving into educators who are learning how to truly listen to their students and each other and to learn from criticism instead of reacting defensively to criticism. Several people who attend regularly have tried one or more of the different teaching techniques that have been discussed and then reported on how those trials went. Everyone is willing to listen and share successes as well as failures. Since the vast majority of their students are not math majors, the prevailing attitude toward mathematics among those students is quite negative. Many of these students would say that they “hate math” or that they’ve “never been very good at math”. With this in mind, the Brown Bag participants are spending time reflecting on and finding ways to improve the atmosphere in their classrooms by listening and sharing ideas with colleagues. They are quietly, and slowly, affecting change in their own attitudes and those of their peers toward their students and each other.

The other seminar is the Mathematics Education Student/Faculty Colloquium (Math Ed Colloquium). This seminar meets weekly and has been organized by a mathematics education faculty member. This past academic year, the topic of discussion has focused on the book How People Learn:  Brain, Mind, Experience, and School, (Bransford, Brown, Cocking, editors), which everyone attending the colloquium has been reading. Each willing attendee was assigned a specific chapter on which to lead a discussion. The initial schedule called for the colloquium to cover one chapter each week, but several discussions took two sessions. These sessions have been very structured with the discussion staying on topic. The people attending this seminar were tenure-line faculty, contract faculty, and graduate students.

The articles that we have read cover a wide range of topics, from the necessity of doing homework well to the physical and chemical workings of the brain. An example of the type of material used and its effects on teaching is an article by Judith Willis, M.D., M.Ed. in The National Teaching & Learning Forum. Dr. Willis is a neurologist who went back to school to earn a Master’s degree in Education. She now teaches in a middle school in California and practices neurology during her summer vacations. In this article, Add the Science of Learning to the Art of Teaching to Enrich Classroom Instruction, Dr. Willis describes various classroom practices and their physical effects on the human brain. One strategy discussed is the necessity of capturing the students’ attention. Before giving examples of activities that capture attention, the author explains what is happening in the brain when learning is taking place, which areas the brain uses to store new information or skills and what happens to that memory storage area and the connecting circuits when the new information or skill is repeated or practiced. This article fascinated me and led me to purchase her book, “Research Based Strategies to Ignite Student Learning”. I have since tried several of those strategies, such as having students use as many of their senses as possible when learning new material or trying to help students make connections between mathematical ideas and other things with which they are familiar. For instance I have a Math CD which contains songs that I relate to the material, like “Signs” by the Dave Clark Five, or use to make a point, “It’s All Coming Back to Me Now” by Celine Dion. Not only does the music relate to the class material, having Celine belt out a song in a lecture hall of 140 algebra students does grab their attention! After discussing the article with my colleagues in the Brown Bag session and creating and playing my CD, I then shared that experience with the group to get their feedback and ideas.

The discussion at the Math Ed. Colloquium is equally lively, with most participants feeling free to express themselves. Since this group has stayed quite focused, the discussion has mainly centered on how students learn as well as on what educators can do in the classroom to facilitate that learning. The book discussion ended several weeks ago. Since the leaders of this colloquium are tenure faculty and have the power to affect change in the department, this same group of people is now using what they’ve learned from that discussion to create a common structure for teaching and assessing the first two required math courses for elementary education majors. The first course covers number theory, algebra and probability, while the second course covers data analysis, geometry and measurement. The department teaches so many education majors each semester that a wide variety of people are teaching
these classes. Since it is vital that the teachers we send out from Ball State have a solid mathematics foundation, the content, instruction, and student performance standards need to be set on a departmental level. One of the goals of the Math Ed Colloquium leaders is for those standards to be based on what was learned from the book discussion. An additional requirement of this common structure is participation in Professional Learning Communities (PLC). All faculty members who teach one of these courses will be required to attend weekly meetings with their learning community. These communities will be open to any interested faculty member. The PLC’s will create a collection of lessons and activities which can be used in the appropriate classes as well as a common assessment tool for each course. One of the goals for requiring participation in a PLC is to ensure that all of the instructors of these classes have an opportunity for professional discourse.

Both of these groups have found that discussions on the scholarship of teaching and learning in general was more valuable to them at this time than discussions on specific mathematical processes. Several times participants in the Brown Bag group have presented alternative approaches to specific topics, but the ensuing discussion was short-lived. However, in the course of the discussion of learning strategies, unique methods of performing fairly routine mathematical operations were introduced. The discussion then focused on why these methods work for some students but not for others, or perhaps why the use of the method in question would be detrimental to our students. I once introduced an alternative method of getting the equation of a line when the slope and a point were given. I was quite impressed with this method. However, my colleagues very kindly expressed their concern that my students would be more confused by “the Rufatto method” than by more traditionally taught formulas. Their points were graciously made and accepted, and the discussion went back to more general topics.

The Math Ed. Colloquium, on the other hand, began the year with the general discussion on the chosen book. After discussing the ideas presented thoroughly, they were then ready to put those ideas into practice. The outcome will be very specific methods for teaching number theory, rational numbers, and the other content course material. Without the seven months of book discussion the group would not have been adequately equipped to enter into the final month of discussion on the plan to create a new approach for the education courses.

By continuing to be students ourselves, we become better teachers. Our classrooms may not look like traditional classrooms. They may be comfortable chairs surrounding a nice conference table. However, we’re learning just as our students learn. We’re sharing ideas, successes, and failures. We’re using more than just our sense of hearing; we’re speaking and writing and reading. We are surprised by what we learn about ourselves, our students and our colleagues. Our homework is to try out some of these ideas and shape them to better fit our individual teaching and learning styles. We assess our progress by observing the positive effects of these changes on our students’ learning. We are inspired to keep learning once we have left that conference room by doing additional, perhaps more in depth, reading and studying other resources that we might never have known existed without these discussion groups.

References
Toppo, G. (2007, April 11). Education science in search of answers. USA Today, P. 6D.
Introduction
We will share with you a study that we started five years ago, during 2002-2003, when our school, a School of Education (ESE), had its first course of preservice primary teachers. We intend to give an overview of the work done during four years, through some of the procedures adopted and some of the results we already have. This research involves many qualitative data that we hadn’t yet analyzed. The underlying idea of this research followed that: (1) Initial teacher education has an important and long-lasting influence on teachers’ beliefs and practices; (2) Teachers’ knowledge, beliefs and attitudes influence their actions in classroom and their interactions with students; (3) Primary teachers are important actors in the beginning of children’s formal education and play a crucial role in promoting academic, social and civic competences; (4) Mathematics is an important subject in elementary education; and (5) Furthermore, national and international assessment have revealed that Portuguese students have low mathematics achievement. (TIMSS, 1994; PISA, 2001; ME, 2002)

Background
It is essential to focus the research on what the preservice teachers think, know, believe and feel in relation to teaching and learning and on what is their relation with mathematics and its teaching and learning. We strongly believe that one of the main goals of initial teacher education is to develop teachers’ knowledge and practice competence, in order to promote dynamic, interactive and reflective teachers (Biehler, 1994). This teacher training must be grounded in a set of assumptions and principles.

The theory-practice principle – it concerns with the perspective that to learn how to teach it is necessary to promote the relation between practice and the different disciplines, for students can perspective and solve the problems that occur during their practice. In particular PP (school teacher practice disciplines) have an important role to promote this connection between theory and practice. The great challenge in the development of the curriculum of this course is the valuation of this relation between practice and the other curricular disciplines. We intend to harness this relation in the perspective of learning to teach, in the way that the preservice teachers are capable to equate and to solve the problems that occurred from their practice in order to become creative, autonomous and reflective professionals. Therefore, as Ponte (2001) relates, “to be a teacher not only demands theoretical and practical competences but also competences in the theory-practical relation” (p.4). In particular the school teacher training disciplines (PP), having as a main objective the development of knowledge and know how, play a central role in this theory-practice relation.

The research principle - this is an important strategy of teacher education because it is individual, starts from the interests of each preservice teacher and allows the connection between theory and practice; The theory-practical relation must allow that the initial training is considered an inquiry process to develop on preservice teachers around professional problems, establishing a strategy of reflective instruction appropriate to different contexts where practical teaching training take place (e.g. Azcaráte, 1999). It allows a better understanding of education and a bigger flexibility and opening to the change.

The self-learning principle - We defend that students must be autonomous. Only that way they will be able to monotorize, direct and regulate their own actions, and develop new competences. Many meanings are attributed to teacher education. We can summarize them in two great groups (e.g. Debesse, 1982; Ferry, 1991): one of them considers a personal dimension where each learner is in accordance with his/her inner identity principles or socio-cultural reality, and that regards to a self-learning process; the other is an external dimension that believes that the teacher instruction is developed by specialists or developed between pairs around pedagogical projects. In that point of view the self-learning process must enable the future teacher to direct this process, as the author of his/her own development. Learning to teach is a long and in development process; The auto-regulated learning, defined for Zimmerman (2000), is a process in which the preservice teacher generates thoughts, feelings and actions that are planned and cyclically adapted to pursue personal objectives. The auto-regulated learning is assumed as a trans-curricular competence, ideally present in all the curricular disciplines.

The reflection principle – it has been indicated as a way to improve our practice mainly after Schön work and it is related with the other principles. Schön (1995) considers that our knowledge lays in action and
the concepts of knowledge-in-action, reflection-in-action, and reflection-on-action constitute the "epistemology of the practice". For this author, reflection-in-action is the process on which the professionals (practitioner), or either, teachers, can learn from the analysis and interpretation of their own activity. The reflection happens before and during the process of teaching and learning. Schön considers that education has a basic characteristic that only happens in this profession: practice leads to the creation of a specific knowledge linked to action, knowledge-in-action, that only can be acquired through one’s practice, therefore is a tacit, personal and systematic knowledge. The teacher, as a reflective professional, is in evolution because he is growing and moving with the experience.

**Method**

The focus of this research was to study the relations between the opportunities given by a primary teacher-training program and the development of mathematics knowledge, beliefs and practice. With this intent we planned to follow up the class of 22 primary preservice teachers of ESEVC for 5 years, since the first to the last year of their initial teacher education - the 4 years program - and during their first year as primary teachers at an elementary school, mainly in what concern to mathematics literacy and mathematics practice at primary schools.

So, our research was oriented by the following questions: (1) What relations can be set up between the teacher program and the knowledge, beliefs and practice of the preservice, in order to rethink the initial training?; (2) What knowledge and beliefs about teaching and learning, in particular about mathematics teaching and learning, reveal the participants, during their training course and their first year as professionals?; (3) What are the views of the participants about the primary teacher profession?; (4) How can we characterize the practices of the preservice teachers?; (5) What impact had the first year of teacher profession on the beliefs and practices of these novice teachers?

It was our intention to follow the students after the teacher-training program, but unfortunately these students, that should be this year working at an elementary school for their first time, couldn’t get any hypothesis of work. So our investigation is over in what concerns to collecting data at the phase of after initial teacher training. Taking into account the nature of the overall purpose of this study, we decided to focus on a qualitative approach and a case study design. We used several interviews, observations, questionnaires, documents and artifacts and we analyzed the data collected in a holistic, descriptive and interpretative way.

**Two disciplines**

**The Mathematics disciplines**

During the course there are three disciplines that were concerned with mathematics and didactics knowledge. In 1st year - Mathematics I - 60 h - one of our purposes is to level the mathematics knowledge of all students in several subjects as Problem Solving, Investigations, Logic, Statistic, and Probability. In the 2nd year - Mathematics II - 120 h - to introduce and deep new mathematics subjects and their didactics, such as Number, Geometry, Measurement, Binary relations. In 3rd year - Mathematics Education - 90 h – our concern goes to the mathematics activity, its processes and the mathematics class: Manipulatives, Calculators, Games, Assessment, School books, Mathematics processes. We can summarize the scope of these disciplines on the following ideas: the essential role of mathematics in pre-service teacher education and in the global development of the teacher; the claim to endow the preservice teacher with alternative ways of selecting and organizing the learning tasks, as well as the adequate procedures for practice; the claim to establish a balance between the scientific and didactical knowledge.

The mathematics education cannot be reduced to the prescription of a set of techniques and facts but helping the preservice teachers to develop ways of learning to learn, ways of learning to teach, ways of organizing the teaching and learning of mathematics and ways of reflecting about their own training experiences. Thus we are preparing them to the process of learning and teaching of mathematics and the profession of being a primary (mathematics) teacher. We adopted a constructivist perspective of mathematics learning with emphasis on problem solving-investigations and laboratorial work with manipulative materials.

**The school teacher training disciplines (PP)**

During the course students have three school teacher training disciplines, at ESE and/or at a primary school, that begin only on the second year of the course. On PP I, 2nd year - 48 h, students went to a
primary school for observations of the environment at school and in the classroom. On PP II, 3rd year – 90h, students develop a project that agrees with the deadlines of each school. And on PP III, 4th year - 360h, it is during this time that students explored Math. In the annual discipline of PP III, the preservice teachers have a weekly intervention in primary schools. Preservice teachers, who are organized in “pedagogical pairs”, stay at schools two and a half days per week. In those days, students teach Portuguese, Mathematics, Science, Expressions (Plastic and Musical), Physical Education, Attended Study, Citizenship and Project. A supervisor teacher from ESE, a group of teacher educators, each one from one of the curricular areas of ESE (mathematics, science, physical education, music, portuguese and history), and a primary school teacher coordinate their work.

The supervisor teacher directs all the work planning of the students and makes the connection among the different curricular areas. In the area of mathematics, preservice teachers are requested to organize their interventions in the classroom through/with: problem solving, investigations, mathematical games and manipulative materials. In the classroom it is expected that preservice teachers question their own students in order to present their reasoning accompanied by explanations and justifications and promote extensions of former problems answering questions such as “why?” or “What if?”.

Results
Mathematics Test
We will present some of the results, some from questionnaires, but we begin with the results from the application of the test of mathematics in the first year of the course. The aim was to diagnosis some of the basic mathematics concepts of these future primary teachers. It used questions from TIMSS and National Tests from 4th, 6th and 9th grades. The questions were reported according to the following areas: Number and operations; Geometry and Measurement; Statistics and Probabilities; and Algebra and Functions. The questions were classified into the following performance: Knowing; Performing routine procedures; Using complex procedures; Solving problems; Justifications and proof; Communication; and Investigations.

There was in average 50.3% of positive results, with a median one of 51.2%. The results and the analysis of the written work allow to identify some lacks and difficulties of the pupils at the level of basic concepts and in the development of certain abilities, essentially complex procedures and justification of reasonings. The worst results relate to content that appeal for previous knowledge of numbers and geometry. Probability had a very good mark because the questions were too easy for them. In competence skills the lower results relate to using complex procedures. (see Table 1 and Table 2)

<table>
<thead>
<tr>
<th>Average by contents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers and Operations</td>
<td>43</td>
</tr>
<tr>
<td>Geometry and Measurement</td>
<td>47</td>
</tr>
<tr>
<td>Algebra and Functions</td>
<td>61</td>
</tr>
<tr>
<td>Statistics and Probabilities</td>
<td>79</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average by competence</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowing</td>
<td>58</td>
</tr>
<tr>
<td>Performing routine procedures</td>
<td>49</td>
</tr>
<tr>
<td>Using complex procedures</td>
<td>40</td>
</tr>
<tr>
<td>Solving problems</td>
<td>43</td>
</tr>
<tr>
<td>Justifications and proof</td>
<td>36</td>
</tr>
<tr>
<td>Communication</td>
<td>45</td>
</tr>
<tr>
<td>Investigations</td>
<td>38</td>
</tr>
</tbody>
</table>

Questionnaires
We choose some questions to analyze from the questionnaires that students fill during the study.

Q27 - Write about what influenced your decision to become a primary teacher (refer to the various past or proximal influences on your decision)

<table>
<thead>
<tr>
<th>Category</th>
<th>%</th>
<th>Description and examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal characteristics</td>
<td>29</td>
<td>Students perceive themselves as possessing the personal characteristics that match those needed to be a teacher (it is a vocation that I have since was a little girl; I always wanted to work with children)</td>
</tr>
<tr>
<td>Love for children</td>
<td>3</td>
<td>Students state their love for children and the desire of taking care of them (I love children and I love everything that concerns children)</td>
</tr>
<tr>
<td>Altruistic motives</td>
<td>1</td>
<td>Students express their concern about helping society in general or children specifically (I like and I want to help children in many ways)</td>
</tr>
</tbody>
</table>
Past experiences 1 Influence from previous formal or informal teaching experiences (I taught already and I enjoyed the experience; I usually help my little brother in his homework; I’m teaching religion in Sunday school)

Career benefits 8 Influence from perceived benefits of teacher career (being a teacher is self-fulfilling; it’s a challenge, it’s a good job)

Course’s selection was limited by external conditions 7 They entered this course because there wasn’t any other choice (because I didn’t enter Psychology; because it is the nearest school from home)

Interest in primary teaching domain 4 Students state a specific interest for being a primary teacher (it’s wonderful to teach a child how to read and write to teach the basic skills)

Past teachers 3 The model of a past teacher or a teacher who encouraged the course choice (I had a good relation with my primary teacher)

Influence from parents and family 3 Influence from someone in the family who is a teacher or who encouraged them to become a teacher (my parents said I cared about children; my aunt is a teacher)

Influence from peers 3 Influence from a friend or acquaintance who is a teacher or who encouraged them to become a teacher (I have a friend who is a teacher and as she told me …).

Parenting 3 Influence from being a parent (I have a son who is in the 3rd grade and I enjoy to help him studying)

Table 3. Categories and percentages of the total units of analysis in students’ responses.

We were also interested to know the opinion of these students about primary curricular subjects, about the teacher training course disciplines according to the importance for the students’ professional preparation, and for students’ personal preparation.

**Q 6 - Arrange the primary curricular subjects, from the most important -1- to the less important -4.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Portuguese</th>
<th>Mathematics</th>
<th>Natural and social Science</th>
<th>Arts and Physical Education</th>
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</thead>
<tbody>
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<td>1st year</td>
<td>7</td>
<td>10</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
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<td>6</td>
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<td></td>
<td>9</td>
<td>5</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>2nd year</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
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<td>2</td>
<td>8</td>
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<td>2</td>
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<tr>
<td></td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>3rd year</td>
<td>9</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>6</td>
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<td>6</td>
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<td>3</td>
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<td>3</td>
<td>4</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>4th year</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
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<td></td>
<td>1</td>
<td>4</td>
<td>1</td>
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<td>2</td>
<td>3</td>
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<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4. Arrange the primary curricular subjects from the most important -1- to the less important -4.

As we can see in the 1st year - Nineteen preservice teachers (82.6%) didn’t like mathematics but this number decreased along the course. Although in 4th year just six preservice teachers (30.3%) answered to the questionnaire, for the first time during all the teacher training course, to the major of the novice teacher, mathematics became one of the preferred subject. Novice teachers told that they feel good in teaching mathematics and they think they have good training in mathematics. The results of the study show that at the beginning of the course students as a lack on mathematical knowledge and their motivation to mathematics it was low but, during the course, they increased their math knowledge and change their motivation about mathematics. So we present one classroom episode to show that students integrated in their practice the main ideas of the curricular disciplines. This episode refers to the third grade.
A classroom episode

The pre-service teachers showed a worksheet with geometric/symbolic sequences to the children so that they could continue the sequence in order to find out the way they appeared. What is the next term? Why? What is the 10th term?

A. □ □ □ □ □
B. □ □ □ □ □ □ □ □
C. □ □ □ □ □ □ □ □ □

Children had time to try to understand, individually or in pairs, the way each sequence was formed, and to tell the following terms. After this period children could show and explain, in the overhead projector, to their colleagues the following terms. Children should be able to make generalizations to every position of the shape, this means, to each of the sequence terms. The preservice teacher started asking: “Which geometric shapes do we have here?” Children promptly answered “circle”. No one referred to the squares. One of the children draws the fourth shape of the sequence on the overhead projector.

The pre-service teacher pointed out the terms order and the number of the circles of each term.

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The pre-service teacher focused children’s attention to the increment of the number of the circles from one term to the next one.

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The pre-service teacher asked: “Now, in the second representation, in the first row of circles, how many are there?” The pre-service teacher’s main goal was that children observed the squares with their rows with a determined number of circles. Nevertheless, she couldn’t direct the dialog this way. She lost the chance of helping children to see rows with several circles. She only focused in the numbers. “Which operation can we use to obtain 4 using 2 and 2?” 2+2 The pre-service teacher didn’t use the idea of the children, but suggested 2x2. She represented the number of the circles of each term in the shape of a product.

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This way the children could observe that each term of the sequence could be represented in a way of a product in which the factors are related with the number of order of the term. So, when the teacher asked how many circles had the fifth shape, they immediately answered “5x5.”

Then the pre-service teacher asked: “And now, in the tenth representation how many circles shall we have?” “100”, “Why?”, “10x10”. Children seem to have understood the way they could get the sequence terms, but not how they arouse form the configurations.

Conclusions
To this point we can draw the following conclusions. 1) The participants were exclusively women. This confirms the preponderance of female as teachers in primary school in Portugal. 2) The results of the test revealed some lacks and difficulties of the participants related to basic concepts and to the use of complex procedures, justifications and proof. 3) The majority of the participants came from humanities area (78%). This corresponds to a representation of the profession. This fact represents a negative image of mathematics that was explored during the initial training, because the first data shows that the beliefs of the preservice teachers about mathematics were negative when they arrived to the ESE course. 4) The main reasons to choose this course were based on personal features and the love for children. 5) It seems that mathematics disciplines and the school mathematics teacher training contributed positively to another perspective about mathematics as a discipline itself and about mathematics as a curricular area in primary school, where they had to work. At the end of the course they show a different attitude towards mathematics. These facts are grounded on the results of the questionnaire and on the answers of the supervisors. Moreover we can say, based on opinions of the supervisor primary teachers, on the teachers of mathematics and on the supervisor of the School of Education, that 6) Pre-service teachers had appealed in their practice to challenging tasks as: problem solving and investigations using manipulative materials and math games. 7) For most of the preservice teachers we have reached our objectives. They integrated and implemented, in their own practice, the major goals of the mathematics disciplines of the teacher training. This study shows us that we need to continue to work hardly and reinforce in particular the reflective component in teacher training course.

References


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MYTHS
AND
FAIRYTALES
Heroines in North American folklore
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Folklore
Any casual assessment of gender portrayals in folk and fairy tales readily reveals the predominance of strong, active heroes and the absence of strong active heroines. When Ragan (1998) began a concerted effort to locate folktales with positive female protagonists, she examined over 30,000 folktales and found an approximate ratio of nine male protagonists to one female protagonist. Ragan surmises that editors are largely responsible for this notable discrepancy because of their methods of collection and subsequent modification of the tales. She observes that the Brothers Grimm were renowned for ignoring women in their collections. In her analysis of gender portrayals, Ragan also notes the insipid roles females play in the majority of folk and fairy tales. She highlights the inert, docile roles played by Snow White and Cinderella, with Sleeping Beauty as the ultimate example of passivity.

Has this always been so? According to Zipes (2006), male-dominated versions of European folklore emerged in the feudal era. Prior to this time, a matriarchal perspective and feminine motifs were the significant features of oral tales. Zipes cites Gottner-Abendroth’s (1980) claim that by the Middle Ages the original tales has gone through patriarchalization. Thus, goddess figures became witches, evil fairies, or stepmothers, active princesses became princes and matriarchal societies became patriarchal. The content of the tales as well as the characters also changed. They became less focused on maturation and more focused on domination. Monarchy was the center of many stories with royalty as the main characters, and the desire to become a ruler emerged as a motivating force for peasant characters.

Zipes (2006) asserts that children of all classes listened to the oral tales and were thus acculturated to the norms, mores, and expectations of the patriarchal society. This acculturation did not end in the Middle Ages. The folk and fairy tales told and written in contemporary times continue to exert a socializing effect on their listeners and readers. Certainly, the absence of strong female characters sends a message to young girls about their importance in society. The folk literature of North America reflects the European tradition of predominantly male heroes to a great extent. However, there are some unique types of North American folklore and heroines. This paper will consider the portrayal of strong female characters in the folk literature of North America.

Folklore of North America
Kiefer, Hepler, and Hickman (2007) observe that it is difficult to describe a body of folklore as distinctly representative of North American culture. A contrast would be the specific body of folklore that is identified as distinctively Norwegian (Spurkland, 2007). Instead, North American stories are as diverse as the cultures of the immigrants who traveled to the “New World,” willing or not, and the indigenous people they met upon arrival. Generally, children’s literature scholars identify four categories of North American folklore: the tales of the indigenous people of the U.S. and Canada, the stories African people carried with them on slave ships and adapted to their new circumstances and the cruelties of slavery, the variants of European stories that evolved especially in regions such as Appalachia or Spanish speaking regions, and tall tales, which chronicled the exploits of laborers who helped develop the industry of North America (Kiefer, Hepler, & Hickman, 2007; Norton & Norton, 2007).

The indigenous people of North America have a strong oral tradition that includes mythology, animal tales, trickster stories and pourquoi tales. The characters and flavor of the stories vary according to geographic location and the specific values of the native nation and tribal groups. However, the values of respect for elders, the earth, plants and animals, and placing the needs of the community above the individual are present in the folktales of all the native stories. Joseph Bruchac (1985, 1994, 1995) is a prolific collector, recorder, and reteller of folktales from several native nations in the United States. The folktales he tells include all of the categories noted here.

African American folklore bears a strong resemblance to the stories from the west coast of Africa. Anansi stories from Ghana, for example, appear as Ananse stories in Caribbean countries and Aunt Nancy tales in the American South (Norton & Norton, 2007). The Brer Rabbit tales feature a wily trickster similar to hare in the stories of Africa. However, in the slave stories Brer Rabbit is a clever, but powerless rabbit who symbolizes the slaves. He often matched wits and always got the better of the larger, cruel and brutish creatures, Brer Bear and Brer Fox, who are metaphors for the slave owners. Through folklore, the
slaves could get the better of their owners and laugh at them, too, without being discovered and punished for doing so.

European immigrants brought their stories to North America as well, and those tales also changed to fit the new surroundings. Thus, it is not difficult to link many stories from North America with their European original. The Irish, Scotch, and English settlers of the Appalachian region told stories that maintained a unique flavor, in part due to the isolated nature of their mountain valleys, apart from the mainstream of North American culture (Temple, Martinez, and Yakota, 2006). Some of the best known Appalachian stories are the tales of Jack, collected by Richard Chase. Kiefer, Hepler, & Hickman (2007) note the similarity between the Brer Rabbit character and Jack, who also overcomes opponents through cleverness, or, in some tales, his good fortune.

Goforth (1998) described tall tales as “exaggerated, humorous tales about historical or imaginary humans and animals, who accomplish the ‘impossible’ in rugged environments” (p. 83). She comments that these stories can be categorized as a type of legend or a separate type of folklore. However they are labeled, these tales are told purely for enjoyment and entertainment. Scholars presume that these stories originated in the nineteenth century as settlers and pioneers recounted highly embellished tales about folk heroes. In the early twentieth century, an advertisement for the lumber industry featured the extraordinary larger-than-life lumberman, Paul Bunyan, and his blue ox, Babe. These invented tall tales were known by folklorists as “fakelore.” Soon there were tall tales about characters who represented workers in various industries that spanned the geography of the United States. For example, on the east coast was the sailor Stormalong, who wrestled an octopus, and in the west the cowboy Pecos Bill, who rode a tornado instead of a horse (Cohen, 1993).

It is incomplete to discuss folk and fairy tales of North America without a description of the effect of Walt Disney’s adaptations of the tales and the depiction of women in those adaptations. Zipes (2006) argues that the root cause of Disney’s alteration of traditional tales is Disney’s life story itself. Born into rather a poor family with a stern unaffectionate father, Disney sought work in Hollywood as a young man. When the movie establishment rejected him, Disney and his collaborators, Ub Iwerks and Roy Disney, created their own animated films, most of which were based on traditional tales. His feature-length film, Snow White, was groundbreaking animation. It also grossly distorted the German fairy tale and re-framed the story from a male perspective. Zipes believes that in this film, as in other folktale films by Disney, the animator projected his own self-perception of the underdog turned prince onto the heroes of his films.

Furthermore, Zipes (2006) claims that Disney portrays women as he believed they should be: docile domestic, and in the home, cleaning. According to Zipes, that is an attempt by Disney, as with all refraimers of folklore, to socialize viewers/listeners to the cultural beliefs to which he ascribed. Certainly, the influence of Disney’s view of folklore on society has been vast and has supplanted the original tales for many children. Fortunately, several authors have sought out folktales that feature strong female characters.

Locating heroines
Ragan (1998), for example, was dismayed at the lack of female characters when she began reading Dr. Seuss books to her daughter. After realizing that the Seuss heroes were almost exclusively male, Ragan set out to find heroines in stories. She scoured folklore from around the world, and compiled them in Fearless Girls, Wise Women, and Beloved Sisters. The collection is divided by geographic areas and includes a section on North America. Most of the tales included in this section are Native American. For folklore unique to North America that features strong female characters, several excellent collections exist. Ross and Bruchac (1994) collaborated on The Girl Who Married the Moon: Tales from Native North America. In the introduction, Ross And Bruchac explain that they chose four tales from four regions of the United States in recognition of the special meaning the number four has in native culture; there are four directions, four winds, four seasons, and four stages of life. The stories in their collection feature females who are brave, resourceful, and committed to their people. A Cheyenne story, “The girl who saved her brother,” relates how a woman rode into battle, saved her brother from the enemy, and turned the tide of battle. A Passamaquoddy story, “The Girl and the Chenoo,” highlights a different form of courage in the story of a younger sister who saves her brothers and herself from a cannibalistic ogre by treating him with kindness and respect, literally melting his heart of ice so that he transforms into a kind old man who lives with the family as a grandfather.

Virginia Hamilton collected stories of strong African American females in Her Stories: African American Folktales, Fairy Tales, and True Tales (1995). These stories are divided into animal stories, fairy tales, the supernatural, and legendary figures. The story, “Woman and Man Started Even” explains why man
has strength, but woman has power. The picture book *Flossie and the Fox* (McKissack, 1986) is an adaptation of the European tale Little Red Riding Hood that originated in McKissack’s family. Flossie, an African American child who is carrying eggs to a neighbor whose henhouse has been raided by a fox is accosted by the fox who tries to scare Flossie into abandoning her basket of eggs. Unflappable Flossie uses her wits to outsmart the cunning fox and safely delivers the eggs.

*American Tall Tales* (Osborne, 1991) features only one larger-than-life female character, Sally Ann Thunder Ann Whirlwind. However, *Cut from the Same Cloth: American Women of Myth. Legend and Tall Tale* (San Souci, 1993) is a collection of folklore exclusively featuring well and lesser-known legendary women. The collection includes Native American figures, such as Star Maiden and Mexican American tricksters, such as Sister Fox and Brother Coyote. The African American tall tale heroine, Annie Christmas, appears in several collections (Hamilton, 1995; Cohen, 1993; San Souci, 1993). Annie Christmas was a seven-foot tall woman who piloted a keel boat both up and down the Mississippi River. Her male counterparts respected and were awed by her strength as well as her fighting and gambling prowess.

**Conclusion**

An examination of North American folk literature reveals active, strong heroines who save their people, win the day, and inspire readers/listeners. Unfortunately, from feudal time to the twentieth century, recorders, retellers, collectors, and animators have alternately ignored, failed to include, reframed or distorted the portrayal of strong females in folk literature. Young women and all of society suffer from these omissions and commissions and deserve, instead, access to admirable, powerful, clever female figures in folklore. Such literature can be found, but it may require some searching. The effort is worth it.

**References**


**Folklore References**


PHYSICAL EDUCATION
Land of opportunities  
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**Introduction**
Outdoor environment has always been an important arena for children’s play in Norway. Times are changing and due to the institutionalizing of the childhood, children spend more and more time indoors. Our tradition with outdoor life and play in nature has found their ways into the Framework plans for Early Childhood, both for Early Childhood Education and Early Childhood Institutions. Since 1990 there has been an increased focus in Early Childhood Institutions on play in natural environments, in the forest, at the beach or anywhere else where children could enjoy themselves and experience both flora, fauna and motor challenges. Fjørtoft (1993) introduced the concept “The 100 acre wood, A place for learning and playing” and a growing amount of early childhood institutions arranged their camps outdoor in a natural environment. A huge amount of Norwegians schools and kindergartens’ present their natural playground at www. These camps ha few facilities, only a place for fire during wintertime, a shelter or a “gapahuk” for bad weather conditions, and a very primitive toilet. The possibilities for variation and diversity according to children’s learning and play and children’s preferences are the dominant factors for these locations’ placing. The experience of children’s wellbeing outdoor and the focus in the Framework plans has brought up topics connected with outdoor play in our teaching. “How to make a natural playground” is one of them. In this paper we want to present The Norwegian concept of natural playground and our theoretical framing of this topic. On the basis of one specific natural playground made by some of our students last autumn we will show examples and finally discuss this phenomena.

**Norwegian concept of natural playground**
The Norwegian concept of natural playground differs from the description we found at the encyclopedia "Wikipedia". Natural playgrounds are explained as play environments that blend natural materials, features, and indigenous vegetation with creative landforms to create purposely complex interplays of natural, environmental objects in ways that challenge and fascinate children and teach them about the wonders and intricacies of the natural world while they play within it (http://en.wikipedia.org/wiki/Playground).

This environment is described as a totally accessible natural playground that creates a beautiful, outdoor play and learning environment. When describing the play components like earth shapes, environmental art and sculptures, indigenous vegetation with trees, shrubs, grasses, flowers, lichens, mosses, boulders or other rock structures, dirt and sand, natural fences made of stone, willow or wood, textured pathways, and natural water features, this natural playground differs from the Norwegian concept (Bagøien and Storlie 2002). Common for those two concepts is the diversity of environment resources which gives options for play and learning and a feeling of wellbeing and belonging. But according to Bagøien and Storlie a natural playground is not permanent, the process of building is important, and children are partners in these processes. When marks of children’s play are left in the environment and the wear and tear is too heavy, the playground will be moved to an other place.

The natural playground does not have security regulations like traditional playgrounds. The security is first and foremost tied to the early childhood teacher’s personal knowledge about motor development, each child’s skills, the group of children, about that specific environment, materials used in installations, knowledge of how to tie knots and own experiences of being outdoor in addition to organisational skills.

Still we have a culture in the early childhood institutions that being wounded belongs to daily life and a happy and challenging childhood. To apply a bandage to a wound and give comfort is a part of that culture. Perception of security will differ from person to person.

**Land of opportunities or wasteland**
Our students were asked to make natural playgrounds, invite children to play, observe their play and analyse according to different qualities of natural settings, climate conditions, accessibility, affordances, biodiversity and safety. They were also asked to make installations that could promote children’s motor learning. We will present a playground that stands out from the others. The playground is located between the institution and the neighbourhood. The place appeared clayey, dirty, narrow, dark and unpleasant, just like a vacant lot, unlike places we normally seek for pedagogical work with children. The area is about 7m x 25m. Figure 1 and 2 show the early childhood institution and the natural playground.
Theoretical framework

Teaching fundament

According to Maurice Merleau-Ponty children learn and experience through their bodies. Children do not have a body - they are their bodies (Merleau-Ponty 1994). Through the use of the whole body, muscles, senses and mind, the world becomes meaningful to the children. They learn about themselves and the world around them. In this aspect we assume that physical play with all kinds of sensory input is important for their learning and wellbeing. The natural environment with its diversity offers children a lot of opportunities for motor learning and experienced based learning. Children make experiences which over time will be transferred to knowledge. Our view of learning is from a broad lifelong perspective (Illeis 2000). Children do experiences, experiments and explorations outdoors. Their learning is experiental learning (Kolb 2001), but also situated and social (Wenger 1998, Stelter 2005)

Child friendly environment

Ecological psychologists first and foremost understand people as moving organisms in the environment and are interested in environmental learning and action in all kinds of settings. By acting the organisms are coordinating information from all their senses. Organism and environment are part of a relational system (Chawla 2006). This thoughts are based on Gibson (1979) who defines “affordance” as physical potentials either positive or negative which the organism perceive while acting in the specific environment. “The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill… It implies the complementarity of the animal and the environment” (Gibson 1979 s. 127). The environment affords something that the organism perceives as a potential for activity. This perception emerges only when there is a match between different characters of the organism and the environment feature. It depends both on the quality of the environment and the organisms ability to take advantage of what the environment affords. Success depends on the perception system the organism has evolved to detect such information and the capability to act according to it. For example, a three affords climbing if the lowest branches are reachable for the child, relative to the child’s height, the branch is experienced as secure relative to the child’s weight, and the strength to pull itself up is relative to the weight and the distance between the branches (Heft 1988).

Kyttä (2006) has identified four types of environments for children’s play based on the concept of affordances and the concept of fields for free action, promoted action and constrained actions (Reed 1996 i Kyttä 2006). The types are:

- “Wasteland” where children are free to move independently, but where there are very few affordances that engage them.
- “Cell” is where children’s mobility is restricted by both physical and social constraints, and as a consequence children know very little about their surroundings.
- “Glasshouse” are places where children can see a world with a lot of possibilities for action, but are excluded from acting in the environment.
- “Bullerby” named after a favourite place in Astrid Lindgren’s novels, are places where children can
move independently, and the mobility reveal many affordances. The more they move the more they engaged in the environment. “The actualization of affordances motivates for further exploration and mobility in the environment (Kyttä 2006 s. 149).

Kyttä goes further and compares this environment with Vygotskys zone of proximal development. Children are presented with a series graduated zones of challenge which are slightly above their current levels of functioning (Kyttä 2006 s. 151). In the Bullerby environment children have an innate drive for further engagements, a positive interactive cycle (Chawla 2006). But since there is a relationship between the child and the environment, one environment can appear as a “cell” for one child but “Bullerby” for another. These categories function as tool for analysing children’s play on natural playgrounds. According to the natural playground affordances can be seen as constraints in the environment not only for movement or motor behaviour, but also for experiencing flora and fauna.

**Dynamic System Theory**

Dynamic System Theory (DST) is based largely on the work of the physiologist Nicholas Bernstein (1967). The theory attempts to answer the “why” motor development occurs, and not only make descriptions of this development. The concept “dynamic” refers to a view that development changes are not linear and continuous. An individual change in motor development is not necessarily hierarchical and does not necessarily involve moving from one level to a higher one (Gallahue and Ozmun 2006). A variety of factors within the system (the child) cause the dynamic changes. This occurs over time and in a highly individual manner. “System” refers to human organism as self-organized and involves a lot of subsystems working dynamically together in a cooperative manner. Maturation of the nervous system is not the principle driver of human motor development and behaviour. The concept of “self-organization” is fundamental in DST and conveys that motor behaviour occurs spontaneously by assembling all the subsystems, like the child’s muscle strength, length, weight, motivation and the like. The concept “constraints” refers to all factors that either promote or hinder movement. Constraints can be in the environment, the task or the organism. In what way this will happen depend on the “degrees of freedom”. In the organism there are a numerous degrees of freedom. Degrees of freedom depend on the neuromotor and biomechanical systems, how the muscles and joints are working together. Many theorists have expanded Bernsteins theory like Kugler, Kelso and Turvey (1982) and Thelen (1995). Esther Thelen expanded DST through her career. She made focus on four central concepts that led to this new grand theory of development (Spencer et.al. 2006):

- An emphasis on time, a motor behaviour emerges in the moment, but the effects of every behavioural decision are stored up over a longer time scale and each change gives grounds for coming changes.
- Behaviour is multiply determined and softly assembled. Which allow changing children to act in a changing world full of alterations. Behaviour patterns can be seen as changeable flexible.
- Embodiment, which means that perception, action and cognition are integrated system that can not be divided.
- Individuality, which means each child solves their individual problems in their unique way and learn from this experiences (Spencer et.al. 2006 s 1533).

In dynamic system theory as we understand affordances are like constraints, factors that either promote or encourage developmental changes.

**Outdoor learning and play for sustainable development**

This experience of natural environment is extremely important because we know that experience of play in natural areas is one of the most important factors for environmental involvement (Chawla 2006). This issue is focused both in the Framework Plan for Early Childhood and in the public debate upon the UN’s climate report. Another important factor for children’s environmental involvement is according to Chawla (2006) are significant adults who direct their attention to elements in the nature. As a consequence of this, to motivate teacher students to use natural environment is a challenge for teacher education programs. A rich natural environment in the schoolyard does not mean that teachers use it in pedagogical work. Malone and Tranter (2003 in Heft and Chawla 2006) compared students’ use of schoolyards. Three of them had a rich array of nature resources, but only one used the environment and let children explore the environment. This school was a Steiner school, which encourage this kind of activity. This example shows that teacher’s philosophy, including knowledge and experience, is important. From our point of view the natural environment has a unique quality for learning, and as teachers in teacher education we have the opportunity to motivate our students to use the nature in pedagogical work by letting them experience and reflect upon children’s learning and play at natural playgrounds.
Experiental learning
In rainy weather a small stream floated in the valley. This little steam gave opportunities for different experiences as shown below. Here named as experiental, exploriental and experimental learning. Figure 3 shows a two years old boy walking upstream with a stick twice his own length. Is it easier to move the stick above or in the water? He experience that resistance is stronger in water than in ear, and that water has more density than ear. He is carrying the stick without snagging in the bushes and experiences the weight of the stick and his own strength. These experiences will hopefully lead to experience based or experiential learning.

![Figure 3: Experience of walking upstream](image1)

![Figure 4: Explore floating](image2)

The girl shown in figure 4 explores how and when the little bucket turn over. She experiences what happens when the bucket fills up with water and how fast it fleet away.

![Figure 5: Experiment with flowing water](image3)

The boy in figure 5 makes experiments just where the stream comes out from a tunnel in a gutter. He tries out how to fill a bottle by holding it in the gutter and later on under the gutter. He experiences the difficulty to lead the water in the aperture. With a little stick he makes a hindrance for the water and is exaggerated when he understands that he can manipulate the gush with his little stick.

Physical play
Rasmussen (1996) focuses children’s opportunity to use their body in a rough and wild way while playing and learning. Early childhood teachers often assume that the best play among children is when the play
situation is quiet and calm. Children’s rough and tumble play is a neglected aspect of children’s play (Pellegrini and Smith 1998). Exercise play (Pellegrini and Smith 1998) is another kind of physical play, and Kaarby (2004) found that exercise play was dominant at natural playgrounds. Baranowski et.al. (1993) find that children 3-4 years old have consistently higher physical activity level outside than inside, and as an implication children’s physical activity will increase by encouraging children to spend more time playing outdoors. Both from a health perspective and a motor learning perspective it will be fundamental that students learn how to adapt for physical activity or physical play outdoors.

Research on children’s play has mostly emphasised the roleplay. Bloch (1989) shows that the time children aged two to six years in Senegal and USA spend in playing roleplay and functional play was only 5% of their playtime during summer. We assume that physical play is natural and children’s spontaneously way of behave and their way of learning. Physical play can be seen in three different ways (Rasmussen 1996): vestibular play, rough and tumble play and deep play. Children do love vestibular play. They seek for ecstasy and intoxication by running, turning around, jumping, sliding, making somersault and the like. Rough and tumble play claims big areas while the children run, catch, fight and make a lot of noise. Deep play is a kind of play that challenges the children. It is a kind of sensation seeking by climbing trees, balancing on a thin rope, jumping from height, diving and similar. We assume this is children’s genuine way of playing and make the frame of their play culture. While they get the opportunities to play like this they after a while will do the experience with flow (Csikszentmihaly 1975). Flow is a condition where children feel the experience here and now, forget everything else, are deeply concentrate and are in complete control. The experience is between fear and dullness and between talent and request. During this kind of bodily experience and mastering we assume that children learn in a way that attends to their natural way of being. Norwegian natural playgrounds offer this kind of physical play and because of the diversity it is likely to find a match in the relation between child and environment.

**Motor learning and physical play**

For most part of Norwegian natural playgrounds the natural environment itself with different threes, cliffs and stones for climbing, bushes for hiding and so on are enough possibilities for children’s play. At this specific playground our group of students wanted to make installations that might give greater challenges.

**Figure 6 and 7:** Crossing the stream - walking on slippery stocks or a swinging stock

Figure 7 shows three boys challenging themselves at a swinging stock. The stock is hanging between two trees and is much more unstable than the footbridge in figure 6. This play will also be vestibular play because of the swinging.

The students’ tool for analysing children’s behaviour is the concept of constraints. They analyse the environment, the task and the child. By doing this they will be aware how each child acts according to affordances. Our first example is three stocks that make up a simple footbridge across the small stream. Figure 6 shows a 4 years old boy walking across the bridge. It is a rainy day and he is wearing rain clothes and rubber booths which are personal constraints in addition to his height, muscle strength and balancing skills. The task is walking, but walking at those slippery stocks affords another walking
technique than walking on a dry, flat and stable surface, these are task constraints. The environment constraints will be the wet, slipper stocks and the river down under which might be fearful. Depending on the situation this balancing can be a deep play for that boy.

Figure 8: A rope for gliding

Figure 9: A bin for motor play and role play

Figure 8 shows a four year old girl gliding in a rope between two trees, an example of vestibular play but also may be deep play and a flow experience.

Discussion

Richard Louv (2006) is in his book Last Child in the Woods worries about the absence of nature in children’s life today. He is drawing a picture of childhood with nature experiences only from media. Children lack direct contact with the neighbourhood nature. He argues that direct exposure for nature is essential for child development and both for physical and emotional health. In Norway we have a long tradition with outdoor life for recreation and getting experiences. Outdoor life is a part of our culture, and this is an important reason why Norwegian early childhood institutions use the nature in their pedagogical work. From our point of view, the early childhood teacher is important in this work. Their way of understanding children’s learning, their engagement according to outdoor life, their knowledge about flora and fauna and their capability to organize are crucial factors. According to Chawla (2006) our challenge is to let children experience nature enough to awake their environmental involvement. In this perspective the concept of affordance is essential. For a child who is unfamiliar with nature, nature might be frightened, and become like a cell or a glasshouse (Kytte 2006). As significant adults our students and early childhood teachers have a job to do in finding environments that engage children and allow them to move independently. There is likely that contact with nature promote a healthy child development in several domains both cognitive, social and emotional (Taylor and Kuo 2006). That is children access to natural playgrounds is an important aspect of teaching early childhood students. We will argue that this specific playground is an example of how it is possible to use vacant lots of space and make a land of opportunities. By making installations the possibilities for movements were increased. The installations were expanded and improved in partnership with the children for further challenges.

References


Bullying in primary school: 
Toys and play at recess time can help in reducing bullying
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Institute of Child Studies, University of Minho

Abstract
The purposes of this research is to understand and describe the role of equipment in the promotion of free play and reduction of bullying at school. Research carried out to assess bullying in schools in different countries shows that this is a very common problem. In Portugal the studies carried out in schools, with pupils concluded that the problem is wide-spread and it is more serious at the playground. Playgrounds in Portuguese primary schools are empty spaces and children do not have anything to do. Children should have the opportunity of playing with toys and equipment that could help them to engage in play and reduce bullying. Physical activity play in recess time at school is related with the social, motor and emotional development skills. Children develop their democratic competences and assertiveness when they play. Playground supervision also can contribute to prevent and reduce bullying at playground.

Key words: Bullying, play, playground, school

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REFLECTIVE PRACTICE
ETEN as a faculty learning community: An exploratory study
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Ball State University, Muncie, Indiana USA

Introduction
Faculty learning communities are international phenomena. The professoriate in the United States, United Kingdom, and Europe use learning communities to promote cultural change and facilitate social unity (Yarnit, 2000). Perhaps the best example of this can be found in the activities of the European Council. At the Lisbon European Council, for example, the European Union stated that one of its primary goals was “to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion” (European Employment Strategy, 2000). To accomplish this goal, the European Commission (2001) indicated that it would attempt to develop a culture that highly values lifelong learning and provides ample access to learning opportunities. The European Commission’s (2007) Socrates II program, better known as Erasmus, specifically targets higher education to promote lifelong learning. The primary objectives of Erasmus focus on the central role of higher education in producing high quality human resources, disseminating scientific discovery and advanced knowledge through teaching, adapting to the constantly emerging needs for new competences and qualifications, and educating future generations of citizens in a European context. The Erasmus program is based on the idea that the increasing speed at which existing knowledge becomes obsolete, and the rapid changes in the means by which it is delivered and renewed, will require the higher education sector to adopt new methods and commit itself wholeheartedly to the provision of lifelong learning (European Commission 2007). Developing viable faculty learning communities, then, is essential to creating a culture of lifelong learning. This may be accomplished by making learning communities a central part of every day social living and working (Nyhan, Cressey, Tomassini, Kelleher, and Poell, 2004).

What makes faculty learning communities so valuable is that they provide forums for constructive criticism, facilitate reflection, and promote reformation (Glowacki-Dudka and Brown, 2006). These activities are important in today’s changing culture of higher education. “While in the past academic work has been characterized by a highly individualised approach, times are rapidly changing and cooperation and collaboration are vital in the complex organizations [and missions] of higher education” (Boud, 1999, p. 4).

The European Teacher Education Network (ETEN) is a prominent, well-established faculty learning community. Founded nearly twenty years ago in 1988, ETEN was established to promote a wide range of international cooperation and exchange, as well as research and publication possibilities for teacher education (ETEN, 2007). ETEN has 52 member institutions in fifteen European countries, the USA and Africa. As a learning community, ETEN has an annual conference at which members present their research and ideas, and may engage in numerous opportunities throughout the year through international exchange programs and other professional activities. This exploratory study examines participation in ETEN, an international faculty learning community. The purposes of this paper are to describe the characteristics of faculty who voluntarily participated in ETEN’s annual conference, describe why they participated, and how they benefited from their participation. The present study reports some of the results from an Internet survey of faculty who participated in the annual ETEN conferences in 2005 or 2006. It also incorporates selected comments from a discussion that took place at the 2007 ETEN reflective practice TIG.

International Faculty Learning Communities
An international survey of faculty revealed that the most common faculty learning community involves one-on-one meetings among colleagues (Wright and O’Neil, 1995). This may be explained by the insecurities that many educators have about their knowledge of effective pedagogy and their lack of training about how effective learning takes place (Hodges, 2006). Furthermore, public discussions of teaching and learning may run counter to traditional academic culture for many educators. While academic research is subjected to blind peer review, teaching is sometimes considered a private enterprise that is not subject to similar professional critique.

Changes to the culture of higher education are critically important not only to the teaching profession but also for social change. Boyer (1990) contends that such changes are possible when teaching is approached as a reflective practice and subjected to peer review and constructive criticism. Hence, when facilitated properly, learning communities can advance teaching and learning through the scholarship of teaching (Richlin and Cox, 2004). To that end, faculty learning communities can foster the development of human
capital by first creating and then fortifying a culture that not only values but also supports lifelong learning.

**The present study**

This research was conducted through an online survey of 2005 and 2006 participants of the annual ETEN meeting. The population consisted of 284 participants' e-mails. Twenty-eight e-mails were returned as undeliverable, leaving 256 useable e-mails. Two weeks after the initial contact requesting their participation, another e-mail was forwarded to those who had not yet responded. Two weeks later another e-mail was forwarded to those who had not responded. There were a total of 52 useable surveys received within one month of the initial contact about the survey, or a 20.3% response rate.

We initially developed the survey based on the literature and our previous research with different types of learning communities. In 2006, we administered a similar survey to faculty and graduate students at a university in the United States. That survey was revised to reflect an international organization and administered for this study. This paper reports selected findings from the survey and incorporates comments made in response to questions posed by one of the authors during the reflective practice TIG at the 2007 ETEN meeting. The participants of the TIG permitted the taping of the respective workshop.

**Findings**

*Characteristics of ETEN participants*

Of the 52 respondents, over 90 percent of respondents have a master’s degree or higher. About 56 percent live in a European country. Nearly 40 percent claim the United States as their home. Fifty-eight percent are females. About two-thirds of respondents are between 26 and 55 years of age. Other demographics are displayed in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Degree Earned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ph.D./Ed.D.</td>
<td>24</td>
<td>46.1</td>
</tr>
<tr>
<td>Juris Doctorate</td>
<td>05</td>
<td>09.6</td>
</tr>
<tr>
<td>Master's degree</td>
<td>20</td>
<td>38.5</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>02</td>
<td>03.8</td>
</tr>
<tr>
<td>Currently pursuing a graduate degree.</td>
<td>01</td>
<td>01.9</td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>19</td>
<td>36.5</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>03</td>
<td>05.8</td>
</tr>
<tr>
<td>Europe</td>
<td>29</td>
<td>55.8</td>
</tr>
<tr>
<td>Africa</td>
<td>01</td>
<td>01.9</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>22</td>
<td>42.3</td>
</tr>
<tr>
<td>Female</td>
<td>30</td>
<td>57.7</td>
</tr>
<tr>
<td>Age (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 25 years old</td>
<td>00</td>
<td>00.0</td>
</tr>
<tr>
<td>26-35 years old</td>
<td>07</td>
<td>14.0</td>
</tr>
<tr>
<td>36-45 years old</td>
<td>10</td>
<td>20.0</td>
</tr>
<tr>
<td>46-55 years old</td>
<td>14</td>
<td>28.0</td>
</tr>
<tr>
<td>56 years old or more</td>
<td>19</td>
<td>38.0</td>
</tr>
</tbody>
</table>

1. two missing responses.

Within the survey, respondents were asked to select from the fourteen thematic interest groups (TIGs) that make up the conference. They responded to the question: "Which TIG do you participate in at the ETEN conference?"; and they could provide more than one response. As can be seen in Table 2, nearly every TIG is represented in the sample. Over half of the respondents participated in the following TIGs: reflective practice, urban education, and instructional technology and learning. The respondents are also relatively new to the ETEN organization and to the conference. Fewer than 40 percent of the respondents have attended ETEN or been a member for four or more years.
Table 2: Other Characteristics of Respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which TIG do you participate in at the ETEN conference?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arts Education</td>
<td>03</td>
<td>05.3</td>
</tr>
<tr>
<td>Biological sciences</td>
<td>00</td>
<td>00.0</td>
</tr>
<tr>
<td>Democracy</td>
<td>04</td>
<td>07.0</td>
</tr>
<tr>
<td>Early learners</td>
<td>03</td>
<td>05.3</td>
</tr>
<tr>
<td>Images and scenarios of teacher education</td>
<td>01</td>
<td>01.7</td>
</tr>
<tr>
<td>Instructional technology and learning</td>
<td>07</td>
<td>12.3</td>
</tr>
<tr>
<td>Internationalisation</td>
<td>03</td>
<td>05.3</td>
</tr>
<tr>
<td>Mathematics education</td>
<td>01</td>
<td>01.7</td>
</tr>
<tr>
<td>Myth and fairy tales</td>
<td>04</td>
<td>07.0</td>
</tr>
<tr>
<td>Physical education</td>
<td>00</td>
<td>00.0</td>
</tr>
<tr>
<td>Reflective practice</td>
<td>12</td>
<td>21.0</td>
</tr>
<tr>
<td>Special educational needs</td>
<td>06</td>
<td>10.5</td>
</tr>
<tr>
<td>Technology teaching and learning</td>
<td>02</td>
<td>03.5</td>
</tr>
<tr>
<td>Urban education</td>
<td>11</td>
<td>19.3</td>
</tr>
</tbody>
</table>

How many years have you been a member of ETEN?
- One year: 11 (22.4%)
- 2-3 years: 15 (30.6%)
- 4-6 years: 14 (28.6%)
- 7 or more years: 09 (18.4%)

How many years have you attended ETEN? (1)
- One year: 19 (37.2%)
- 2-3 years: 12 (23.5%)
- 4-6 years: 12 (23.5%)
- 7 or more years: 08 (15.7%)

1. One missing response.

Reasons for participation at the annual ETEN conference
Respondents were asked to indicate why they participate in the annual ETEN conference. They could provide multiple responses to the question.

Table 3: Why do you participate at the ETEN Conference?

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>% (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why do you participate at the annual ETEN conferences?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collegiality</td>
<td>30</td>
<td>57.7</td>
</tr>
<tr>
<td>It is an opportunity to talk about teaching and related issues.</td>
<td>40</td>
<td>76.9</td>
</tr>
<tr>
<td>A colleague recommended that I participate.</td>
<td>17</td>
<td>32.7</td>
</tr>
<tr>
<td>I have had no formal education or training in teaching and ETEN provides the opportunity to learn.</td>
<td>02</td>
<td>03.8</td>
</tr>
<tr>
<td>I would like to gain insights into improved teaching and learning.</td>
<td>31</td>
<td>59.6</td>
</tr>
<tr>
<td>I already do a good job with teaching, but I would like to improve.</td>
<td>17</td>
<td>32.7</td>
</tr>
<tr>
<td>I am interested in peer input and sharing ideas.</td>
<td>41</td>
<td>78.8</td>
</tr>
<tr>
<td>I am looking for an interdisciplinary forum to discuss teaching and learning.</td>
<td>26</td>
<td>50.0</td>
</tr>
<tr>
<td>I am looking for an international forum to discuss teaching and learning.</td>
<td>39</td>
<td>75.0</td>
</tr>
<tr>
<td>I like to travel to different countries and meet different people.</td>
<td>32</td>
<td>61.5</td>
</tr>
</tbody>
</table>

1. Percentages reflect the number of respondents selecting an item out of the 52 survey respondents.

As can be seen in Table 3, most respondents participate because they want to speak with other educators about teaching and learning: “It is an opportunity to talk about teaching and related issues” (77%); “I am interested in peer input and sharing ideas” (79%); and “I would like to gain insights into improved teaching and learning” (60%). Many respondents also saw value in international (75%) and
interdisciplinary (50%) forums to discuss teaching and learning. Still others emphasize the important part that meeting people from other countries (62%) and collegial relationships (58%) play in professional development activities.

**Benefits from participation at the annual ETEN conference**

Respondents were asked to indicate how they benefit from participation at the annual ETEN conference. They could provide multiple responses to the question. Perhaps it is not surprising to learn that motivation for participation in the annual conference relates to their benefits from the experience. As shown in Table 4, respondents were interested in understanding “…more about students and how they learn” (42%) and learning “…teaching strategies and tools” (58%). Respondents also mentioned that they found it beneficial to attend ETEN because it provided an opportunity to better understand the education systems in other countries (75%). Respondents also benefited from their participation by developing friendships (62%) and networking with colleagues (83%). Discussing teaching and learning from interdisciplinary (44%) and international (73%) perspectives were also highly valued.

**Table 4: How do you benefit from participating at the ETEN Conference?**

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I develop friendships</td>
<td>32</td>
<td>61.5</td>
</tr>
<tr>
<td>I network with colleagues</td>
<td>43</td>
<td>82.7</td>
</tr>
<tr>
<td>I understand more about students and how they learn.</td>
<td>22</td>
<td>42.3</td>
</tr>
<tr>
<td>I gain teaching strategies and tools.</td>
<td>30</td>
<td>57.7</td>
</tr>
<tr>
<td>I receive affirmation that I am doing well.</td>
<td>19</td>
<td>36.5</td>
</tr>
<tr>
<td>I am looking for an interdisciplinary forum to discuss teaching and learning.</td>
<td>23</td>
<td>44.2</td>
</tr>
<tr>
<td>I am looking for an international forum to discuss teaching and learning.</td>
<td>38</td>
<td>73.1</td>
</tr>
<tr>
<td>I gain better understanding of cultures and national education systems.</td>
<td>39</td>
<td>75.0</td>
</tr>
</tbody>
</table>

1. Percentages reflect the number of respondents selecting an item out of the 52 survey respondents.

**Comments Made at the 2007 Annual Meeting**

Within the presentation about this survey at the conference, participants were encouraged to discuss their own experiences with ETEN and the conference. Approximately 30 ETEN members participated in the reflective practice TIG. The question was posed: “Why do you participate in the annual ETEN conference and how do you benefit?” A lively discussion commenced.

A variety of views and diverse perspectives were common throughout the discussion. One participant commented that he attends the conference to be aware that there are multiple perspectives on “reflective practice”, its definition, and its application in the classroom. He also finds the discussions stimulating and provocative, and that it meets his expectations for attending ETEN. The discussant of the TIG commented that “anyone can read a paper,” but here, “we discuss ideas” and “everyone wants to share their ideas.” Another participant commented that last year, she came to share or “even to show off a little”; however, before the conference was over she realized that she received more from others comments than what she gave during the discussion. This year at ETEN, she was interested in what others had to say.

Identity and belonging were important aspects to the motivation and benefits of participating in ETEN. A participant mentioned that she attends because “we are among colleagues; we are all practitioners”.

“Attending the ETEN conference”, said another participant, “gives all of us an identity as teachers.” Yet another asserted:

The conference is a resource for teachers who are interested in the ideas of others. At the end of each conference we summarize what has been explored and what might be explored the following year. Each year builds on the next; an expanding dialog. There is always something new to consider for the following year that motivates me.

Both of the co-authors of this article have also attended the conference twice, albeit in separate years. We find that the collegiality and sense of shared knowledge and experience keeps us interested and active in this international faculty learning community. The participants each could interpret the shared information to fit their own cultural and organizational contexts. Although not a dominant theme in the
survey or discussion, the international and cultural aspects of this conference make it unique in scope and purpose.

Conclusions
ETEN, as an international faculty learning community, provides a forum for cultural change and unity among professional educators. It supports and encourages lifelong learning and dialogue among conference participants. As an annual conference, ETEN offers collegiality and support for one another through reflective practice and dialogue about our teaching, both philosophically and practically, in an international forum. Other aspects of ETEN are more individual with faculty and student exchanges, as well as the smaller ECO meetings.

While research (Hodges, 2006), suggests that faculty learning communities most often take the form of private one-on-one meetings within institutions of higher learning, respondents to the survey and participants at the conference actually seek out public discourse about teaching and learning. The networking and collegiality within the context of discussions about teaching and learning were the highest rated benefits and the reasons most given for their participation. ETEN participants look for perspectives that are different from their own. They find value in taking risks and giving consideration to constructive criticism. Learning from each other provides opportunities to examine ones’ own practices through different lenses and to better understand the strengths and weaknesses of those practices.

ETEN provides a solid foundation upon which conference participants may contribute to the construction of a culture that values collaboration and cooperation in higher education and society. In order to continue this momentum within their own context, ETEN participants are encouraged to create opportunities at their home institutions to expand and further the discussion. Given these characteristics, one might surmise that ETEN conference participants are interested in catalyzing cultural change in higher education and society.

References
Hodges, L.C. 2006. Helping Faculty Deal with Fear in To Improve the Academy, Resources for Faculty, Instructional, and Organizational Development by Sandra Chadwick-Blossey (ed), Bolton, MA: Anker Publishing Co.
A coaching approach to supporting reflective practice
Shaun Hughes
University of Worcester, England

Context
The particular context for this workshop was that of the trainee teacher and school-based tutor, sometimes called subject mentor. The key points however are generic and apply to anyone facing challenge and perhaps especially to those involved in any kind of helping relationship, such as mentoring or coaching. The proposition was made that reflective practice can be seen to operate at different levels and that these levels equate to the theories of single loop learning and double loop learning. (Argyris and Schon, 1978) Reflection is seen as generally straightforward for the trainee and mentor when the ‘mechanics’ of teaching are concerned i.e. skills are developed through the typical cycle of reflection as exemplified by Kolb (1984) So for example a student trying to improve the pace in a lesson would reflect on observations made and advice given, try out new approaches, reflect again on improvement. The same would apply for the preparation of materials or the planning of a lesson. This kind of reflection can be seen as emotionally neutral and safe. The trainee is challenged certainly, but the process is generally one of problem solving and practice in skill development. This equates to single loop learning, a defining feature of which is surface change. This does not mean that it is not significant. This kind of reflection is not always easy. Reflection requires a change of mindset and this can involve challenging assumptions, actions and situations.

More challenging and far less emotionally neutral and safe is where the challenges become personal requiring deeper reflection. For example a trainee experiencing classroom behaviour problems may well need to re assess his or her understanding of and response to issues such as conflict, aggression, assertiveness and criticism and this can often raise issues from their own childhood and formative years. Another example would be a young female mentor dealing with an older, arrogant male trainee. The mentor may well face challenges that go far beyond a simple model of developing and learning the necessary skills to be a teacher. Such situations may require double loop learning which leads to an interrogation of what Argyris and Schon (1991) call the ‘governing variables.’ When these core values are challenged this can lead to a change in self efficacy, self esteem and indeed the sense of self. It would also necessarily lead to a change in behaviour and response. A parallel was drawn here between reflexive practice and reflective practice. Reflexive practice involves a focussing on the affective as well as the intellectual:

Reflexive practice involves thinking more critically about themselves, their assumptions, actions, and situations they encounter; to see multiple interpretations and constructions of reality

(Cunliffe, 2004 pp 407-426)

This approach is described further by Cunliffe (2004 p.419) as ‘being open and identifying assumptions and then moving to a critically reflexive questioning of those assumptions and actions and recognising uncertainty and contradictions’

People’s responses to these situations are a result of many complex factors to do with past experiences, perceptions, emotions, beliefs and values. A sense of self efficacy developed from early childhood gives us our beliefs about our own capabilities as we approach difficult tasks. Such responses are often on the basis of instinct and habit and as such can be hidden and unconscious. Whereas single loop learning can be seen as problem solving and incremental skill development, double loop learning requires deep learning of the kind associated with developing new ways of thinking and behaving. It was suggested that ‘emotional filters’ exist at every point in the reflective cycle. These filters acknowledge and accept some thoughts and feelings, but the filters may also act as a barrier that rejects or leads to distortion. In this way they can be seen as contributing to the development of ‘learned helplessness’ or ‘limiting behaviour’.

Coaching, defined as “a conversation, a dialogue, whereby the coach and individual interact in a dynamic exchange to achieve goals, enhance performance and move the individual forward to greater success” (Zeus and Skiffington, 2003), was offered as a strategy to support this kind of deep reflection. Uniquely it offers a way to ‘help people increase their sense of self-direction, self esteem, efficacy and achievement.’ (Cox and Ledgerwood, 2003 p.4)

Use of the GROW model, as developed by Whitmore (1997) was recommended as an effective tool to explore and resolve some of the issues arising from challenge.
The Workshop
This was designed to offer the participants an experience where it was possible to reflect upon the thoughts and feelings associated with the challenge. Indeed the participants were required to ‘look deep inside themselves’ to reflect upon and express what they were feeling and thinking. These are referred to in this writing but not as direct quotes. I have tried however to be true the main points of what was reported. My role as facilitator was to be supportive and to reassure the group that I was there to help solve any problems as they arose. As facilitator and experienced in this activity, I expected some failures but was certain that success would come eventually.

The activity involved the construction of an origami box under the direction of the workshop leader. This involved watching a demonstration of the making of the box and memorising of 10 steps. The group was asked to reflect upon their feelings, their confidence levels and sense of efficacy once they knew the task:

I felt intimidated knowing that I was not very good at this kind of activity.
I was nervous before starting because I did not want to fail and to be seen to fail in front of my colleagues.
I couldn’t wait to get started and felt very competitive.
I didn’t want to be the first to have a problem.

Many of the group reported that the activity took them back to Primary School days and feelings associated with success and failure. All of the group were appreciative of the supportive stance taken by the facilitator. A colleague who had been trained in the activity in order to support the participants reported some anxiety as he had forgotten the process and was worried that someone might ask for support.

All participants successfully completed the box. Five people had made mistakes and needed to start again. All expressed satisfaction and two people had revealed that they had not believed they could do it. One of the participants who had experienced difficulty initially had sought assistance from other people, succeeded in the task and went on to make a different origami construction. Those that had completed the activity quickly went on to create their own ideas. It was clear from feedback that this activity had highlighted many aspects of reflection and learning and certainly highlighted the connection between learning and the emotions. Despite English being a second language for many of the participants it was also clear that this was a group with a positive self efficacy: “People with high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters intrinsic interest and deep engrossment in activities” (Bandura, 1994)

The boxes were then labelled in line with the Change Cube as developed by Kewley and Thomas (2004)

Behaviour (lid); what we do and say, how we respond to challenge, new ideas and criticisms. There were many different kinds of behaviours in response to the challenge. Some participants were laughing and joking, some were very attentive, there was increasing discussion as the activity progressed, some admitted their feelings readily about the activity some stayed silent. The behaviour was good and no one refused to do the activity.

Beliefs (base); ideas we no longer question, values, conscious and unconscious, beliefs that are limiting. Some ‘limiting belief’ was expressed through comments such as ‘I can’t do this’ but no one gave up before trying. This was partly due to the approach of the facilitator and a number of interventions and partly due to a strong sense of efficacy in this talented professional group. Another factor that was important was the willingness of the group to support each other. There was no sense of anyone being tested.

Perceptions; how we see things, what people say to us and have said to us, how we interpret situations and our view of risk taking. There were some comments that revealed perceptions about abilities in this kind of work. Some of the group were interested in the facilitator’s instruction that there were 10 steps in the construction of the box. They had counted the steps and noted that there were many more steps. Their chosen strategy of memorising by counting had been undone by inaccurate information and they had found this unsettling.
Most of the group confirmed that they had a perception of their abilities in this area based upon past experience and what people had said to them.

**Emotions**: *our level of emotional intelligence, awareness of others, self management and social skills.*

The group remained calm throughout the session although there were examples of hands shaking, including those of the facilitator. This was seen as a symptom of stress. This was related to the three part brain which suggests the brain can be divided into the Reptilian, the Emotional and the Intellectual. Physical symptoms of stress can be seen as part of the reptilian response i.e. fight or flight. Some talked about a feeling of nervousness and some said they felt very aware of what other people were doing.

**State**: *our sense of well being, physical and emotional health, self belief.* Interestingly one participant suggested that this activity had felt safer as the group had begun to relax with each other during the earlier part of the day. Our sense of security and belongingness seems to be a positive factor in success.

**Self talk**: *what we say to ourselves in our head, how we deal with criticism.* All agreed that there had been self talk during the activity. Some had challenged the voice in their heads and some had ignored it. Some self talk was negative and some was positive and uplifting.

Goleman (2002, p.57) likens self talk to an inner conversation which is, ‘the component of emotional intelligence that frees us from being a prisoner of our own feelings.’ It was clear that self talk, especially of the unsolicited kind, plays an important part in self reflection and the reflective process. The Change Cube is useful because it provides a framework to explore responses to challenge, to understand behaviour and, by attending to and analysing the different sides of the box, help deepen reflective practice. An exploration of the different facets of the cube can lead to a change in belief and behaviour, “When coaches help individuals and groups to modify their self talk, perceptions, physiological state or feelings, they directly affect the beliefs and therefore the behaviour of the individual.” (Thomas and Smith 2004, p.69))

The GROW model (Goal, Reality, Options, Will) as developed by John Whitmore (2002) was offered as a useful tool to support self coaching and the coaching of others. A structured process of questioning was suggested to help clarify issues and find solutions. Given more time these questions could have been practised in a coaching role play. The concept of coaching as an aid to performance management has long been accepted in the UK in business. In education at all levels it is increasingly being seen as a valuable and effective tool for CPD (Continuing Professional Development) and as a vehicle for distributed leadership. A National Framework for Mentoring and Coaching (DfES 2005) has been developed by CUREE (Centre for the use of Research and Evidence in Education) and this has gone a long way to add clarity to the definition debate that seeks to distinguish between Mentoring, Coaching and Co-Coaching. The National College of School Leadership (NCSL) has similarly been championing a coaching approach:

“There is also a fast growing appreciation of the power of effective individualised support in the form of coaching or mentoring, and for collaborative forms of learning. Indeed the value placed on such learning relationships by school leaders and teachers at all stages at all stages of their careers has led to the integration of coaching, mentoring and collaborative learning within many professional programmes, from initial teacher training to headship preparation and leadership development.” (Creasy and Patterson 2005)

The transformational power of coaching is largely due to the individualised support which focuses on raising awareness of the key drivers to behaviour along with the barriers that may inhibit learning. There is a sense in which both coach and coachee can be empowered through this approach. Standing outside normal line management systems it holds much promise for personal development where the only assessment is self assessment.

As the coaching approach grows in schools and colleges in the UK an expected and hoped for outcome will be increased confidence, a higher sense of self efficacy and a more open and robust response to change. There is a wide variety of contexts where a coaching approach is helpful. In education in the UK it is increasingly being used to support mentoring in schools, in co-coaching relationship for teachers at any stage of their career, in any one to one coaching relationships and by senior management in schools, colleges and universities. Interestingly the coaching approach is also being adapted to support pupils in their learning. A number of projects involving learning mentors in schools are underway and it is now common for pupils to be coached either through transition moments or where there is underachievement.
Postscript
Everyone succeeded in the activity and expressed pleasure in the making of the box. Almost everyone carefully unfolded the box at the end of the session and took it away with them. The TIG leader during his final feedback session showed his box to the whole conference with evident pride. As the delegates were leaving he was stopped by another TIG leader who asked if he could teach him how to make it.

References
Deepening reflective practice:  
Considering our teaching and our lives in the “Swampy lowlands”  
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“There are those who choose the swampy lowlands. They deliberately involve themselves in messy but crucially important problems and, when asked to describe their methods of inquiry, they speak of experience, trial and error, intuition, and muddling through” (Schön, 1983, p. 43).

Introduction
As the randomly-selected “lead-off” presenter in the Reflective Practice group in this year’s ETEN Conference, I took great care in conceiving of a question for consideration when I ended my conversation, a question in which the others could hopefully thread into with their upcoming presentations and conversations. A recent professional experience the week before at the American Educational Research Association in Chicago led me to the question I wanted to ask: “How can we deepen our reflection as teacher educators and researchers?”

The dialogue in Chicago within my Narrative and Research special interest group centered on ethical issues of the researcher and reflective practices based on involvement with research participants, some who were teacher candidates. Narrative inquiry explorations require the researcher to deal with ambiguity in his or her search for particularities and compelling stories. One must embrace ambiguity and trek into the lowlands when engaging in such research. The sessions I attended pulled my moral self to the foreground as point, and I re-identified myself as living in the “swampy lowlands” as I began to re-story my experiences in my dissertation research. I listened to more experienced narrative researchers speak of negotiating text with research participants and imagining oneself in the position of participant; I listened to speakers who noted the tenuous spirit of relational research and the relational capability necessary for the task; I heard of those who sometimes pillege certain stories or value one’s story over another’s, highlighting the ethical task of researchers; I listened as autoethnographic practices were encouraged as a way to redirect researchers to self-analysis; I felt the pinprick of complacency as I noted in my journal to involve myself more with diverse identities and to think of ways to enter into a community of learners who are different than what I know. Michael Connelly, finally, made me increasingly grateful to have selected narrative inquiry as my preferred research methodology as he shared that the main contribution of narrative inquiry may well be that it keeps teacher researchers honest.

An epistemological stance
So at ETEN, as I shared the stories of several of my research participants, along with my own (a tradition in narrative inquiry), I shared, too, the value of some epistemological practices: respecting the lived lives of teachers, and their ways of knowing (their teacher knowledge), as a researcher, when interpreting their experiences; re-storying my own experiences side by side with the stories of my participants; creating and examining metaphorical thought as one makes sense of experience; and considering continuity, interaction and context—Dewey’s (1938) “theory of experience” as a framework for understanding and portraying participant stories. These practices, I hoped, would effectively feed into ending question.

Re-storying and respecting
As I shared a brief portion of my research, I highlighted my own messy experiences as a researcher, one in which I changed a belief and an attitude I held early on as a master teacher and professional developer, one in which I was the more knowledgeable other assisting those who needed to know what I knew. Upon additional readings of Dewey, Buber, Clandinin and Connelly, Bruner and others, I realized my teacher participants were making decisions about the use of Synectics, the model of teaching prominent in my study, based on their teacher knowledge and lived lives on their personal and professional landscapes (Clandinin & Connelly, 2000). I had reached a plane of understanding that teachers are curriculum makers in their own right, based upon their lives as curriculum (Clandinin & Connelly, 1992). The Mobius strip image I found in Bateson’s (1994) writings perfectly reflected my experience with this newfound regard for teacher knowledge, and also allowed me to identify myself living along the strip, looping back through the past to make sense of the present, as I now drove along beside others in the same context, yet a new one for me.
Making Sense with Metaphors

Rounding another tangle of the swamp, I spoke of two teacher participant generative metaphors which garnered much power throughout my research. Participant Sylvia, a middle school language arts teacher responsible for second language learners of Latino descent, chose to adapt the process of Synectics by providing her students a thesaurus to use during the Synectics brainstorming. Her previously labeled “unsuccessful” students--based on their failure to pass the state accountability test--suddenly lifted off into achievement with their writing. Sylvia described this experience in metaphor:

I like ARMED them; I like empowered them with that little thing [the thesaurus]. While we were doing the Synectics, they were flipping through those pages and telling me the words... those words that increased their vocabulary. And they were thinking and they were looking at each other like, “Wow... you’re coming up with those words?”

Sylvia’s metaphorical notion of “arming” her students had the intent of making them stronger, specifically in their language learning. But the results went way beyond that. Later in the discussion, Sylvia reflected on how her advancement with Synectics, her curriculum adaptation, had affected her students:

they [her students] wouldn’t stop since school started telling me they were in my class because they were dumb, I told them. “Guys, stop saying that. Give me a chance. I’ll try to teach you the best I can...” And ever since I started doing Synectics, and they learned all these words, and they got the hang of it, then it’s like WOW, they started saying that they were gifted, that they were very smart, that it was a mistake that they were there. It changed their self-esteem. ... And now they know that they’re smart and they’ve got stuff to offer to the class. Because of the Synectics. And it’s true, I thought to myself. Sylvia’s students now wore the armor of respect and admiration for themselves. They will now carry their newfound self-esteem to every class and probably experience higher levels of success in every class because of Sylvia’s determination to live out her curriculum with her students. Sylvia’s journey with Synectics matched an important statement by Clandinin and Connelly in a book chapter they wrote entitled “Teacher as Curriculum Maker.” “Teachers and students live out a curriculum; teachers do not transmit, implement or teach a curriculum .... An account of teachers’ and students’ lives over time is curriculum, although intentionality, objectives, and curriculum materials do play a part in it” (1992, p. 365).

Participant Pearl May, a high school language transition teacher who also works with struggling students, provided the metaphor which served as the hinge of my new understanding of teacher knowledge.

You get entrenched as a teacher who’s been teaching as many years as I have... Nobody can tell you how to do anything because you’ve been doing this for 33 years and you know what you’re doing... So when you get a complicated instructional model like this [Synectics] it’s very uncomfortable to give up what you’re secure in doing... I mean new teachers are looking for new stuff all the time because they don’t have anything invested in anything else. As a newer teacher you don’t have the investment that older teachers have in a tried and true product so there is no security problem for them...

So visually and metaphorically, Pearl claimed that it is more difficult for more experienced teachers to move out of their trenches of protection or to give up their roots of teacher experiences. The metaphor of “investment” also brought forth new images for the knowledge community group. We all build our security in the curriculum we create; we create ourselves and choose to be entrenched, to build investments, and to make connections. Retelling the stories of the knowledge community participants did what Clandinin and Connelly (1992) described.

retelling sheds light on the question of dilemmas in teaching and curriculum and the ways in which curriculum is ultimately moral: it has to do with the ways in which we live our lives. That teachers are moral agents is important to our notion of the teacher as curriculum maker. (p. 389)

**Theory of experience found in a knowledge community**

I also chose to share with the Reflective Practice TIG how the role of “knowledge communities,” conceived of by Craig (1995), helped to enact Dewey’s theory of experience. Sylvia, Pearl May, and four other teachers, all of whom I had worked with in regard to Synectics and its use in their classrooms, met away from the schools in “safe, storytelling places where educators narrate the rawness of their experiences, negotiate meaning for such experiences, and authorize their own and others’ interpretations
of situations…” (2003, p. 12). The continuity or temporality of our relationships revolved within our shared experiences with the model of teaching involved in the conversations. And I simply encouraged them to talk, to share and to listen to each other. During these gatherings, metaphors as the ones described above surfaced and elicited additional understandings for each of us. I wanted the Reflective Practice group to consider knowledge communities further in terms of reflective practice, so I shared Craig’s conception of knowledge community gatherings as “savannahs,” (2002). Encompassed in this collegiality and collaboration, another important tenet of knowledge communities is the reflective habits that form through this dialogue. In regard to interaction, Bateson (1994) spoke of varying roles which allowed her own multiplicity of vision when interacting with others. She mentioned that people can be “strengthened to meet uncertainty if they can claim a history of improvisation and a habit of reflection” (p. 6). Metaphorically, she continued to describe this multiplicity as a single braid (p. 103). I have often thought of this braid when I think of the stories that wind themselves around each other during knowledge community dialogue, forming a particular strength which may account for change.

From this base, I knew honoring teacher knowledge within a community responsible for one another would provide for teachers’ narrative authority (Craig & Olson in LaBoskey & Lyons, 2002), the centerpiece of coming together being the sharing of experiences in a reflective manner while watching stories wind the narrative braid. I found resonance (Conle, 1996) there in the experiences of other educators, along with varying perceptions of teaching and learning. Inside this invaluable space, participants felt nurtured in reflection and in integrity for their profession.

Deepening reflective practice
My TIG leader, Philip Chambers, ended our time together at ETEN by mentioning the “uncertainty” of reflective practice, which paradoxically often leads to the “possible” in reflective practice. He spoke of the great divide between the positivist stance and the impermanence and messiness of the opposite—life in the swampy lowlands. Schön parallels these thoughts as he speaks of reflective practitioners, who use “reflection-in-action,” to “proceed, even in situations of uncertainty or uniqueness, because it is not bound by the dichotomies of Technical Rationality” (1983, p. 68-69). He also noted that reflection-in-action may not always be accepted as a “legitimate form of professional knowing,” but is better than being a practitioner who is “locked into a view of themselves as technical experts” who “find nothing in the world of practice to occasion reflection” (p. 69). Therefore, maybe the uncertainties and comforting tensions found in re-storying narratives next to those of our participants; making sense of experience through metaphor; and safely sharing experiences in curriculum making in knowledge community gatherings can be worthwhile investments of time for teacher educators and researchers?

What is the best course of action when our teacher candidates do not adequately take responsibility for student learning? Can we, the leaders for these teacher candidates, reflect-in-action, and share our past stories to heighten their growing knowledge? What is the best course of action when we find ourselves in dichotomous positions as a researcher? Could we see ourselves, metaphorically, as split in half and thus, useless in two halves? Could this help us to blend our dividing stances and make increasing sense of our experiences? And what of the times when we just need a hot tub experience, a time to expose our insecurities with friends and colleagues? A hot tub is reminiscent of leaving cares behind when one steps out of it, and that is how I felt after sharing and understanding in the narratives from those in my knowledge community. Releasing the tension and stress from the responsibility involved in working with the minds of young people and teacher candidates requires a kind, social environment of acceptance. In a group of like-minded educators, someone inevitably speaks of a successful moment from their school year or recalls a student who brought great joy. A new question evolves for all to consider. Then hope prevails and a renewed vigor is adopted from a few hours in a hot tub with friends. Palmer (1998) described this scene. “The inward quest for communion becomes a quest for outward relationship: at home in our own souls, we become more at home with each other” (p. 5). Craig (2003) noted that “Not only did these metaphors [created by teachers in her studies] authentically capture immensely complex epistemological dilemmas in the teachers’ knowing, they also helped the teachers to address and live through the tension-filled dilemmas they encountered on the professional knowledge landscapes of their schools” (p. 202). Could teacher educators also benefit from such scenes as they engage in reflective practice, possibly in knowledge community groups?

In conclusion, let us allow our habits of attention and interpretation to be stretched, pulled and folded back upon themselves as we listen to Schön’s call for reflection-in-action:
The study of reflection-in-action is critically important. The dilemma of rigor or relevance may be dissolved if we can develop an epistemology of practice which places technical problem solving within a broader context of reflective inquiry, shows how reflection-in-action may be rigorous in its own right, and links the art of practice in uncertainty and uniqueness to the scientist’s art of research. We may thereby increase the legitimacy of reflection-in-action and encourage its broader, deeper, and more rigorous use.

There are savannahs there for us, but we must create them and acknowledge the narratives in our lives to do so.

References
SPECIAL EDUCATIONAL NEEDS
Pre-service teachers and their perceptions of the inclusive classroom
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Introduction
The history of American special education has its roots in the 1954 United States Supreme Court case, Brown V. The Board of Education of Topeka, Kansas. In that decision, the high court ruled that the Plessey V. Ferguson doctrine of “separate but equal” was inherently unequal. In Brown, the issue was racial segregation. Brown attempted to guarantee that all children regardless of race would have access to public education that would not isolate the races. At the same time, children with disabilities, if they were even in a school, were also segregated in American education. Most developmentally disabled students were not even in school. The first major American special education law in 1975, PL 94-142 (EAHCA) The Education of All Handicapped Children Act extrapolated the Brown doctrine to include the right to a “free and appropriate education” for all students of all abilities in the “Least Restrictive Environment”. Another aspect of this legislation requires that each state must have policies and procedures in place to ensure that students with disabilities, including those in public or private schools and institutions, are educated with children who do not have disabilities. A further requirement of EAHCA was that all such handicapped students must have an IEP (Individualized Education Plan) that would allow such students access to the general curriculum with appropriate adaptations to the curriculum. The basic premise of PL 94-142 is that if students can learn in a non restrictive environment (i.e. a general education environment), then they can work and live in such environments when they become adults.

Subsequent federal legislation clarified the mandate for inclusionary practice in education. IDEA (Individuals with Disabilities Education Act) was enacted in 1990 when Congress modified the PL 94-142. Further amendments to IDEA were passed in 1997 also known as Public Law 105-17. The purpose of this law was to require school districts to design a free and appropriate public education to meet the unique needs of students with disabilities that would prepare them for employment and independent living.

Many educators welcomed these changes. Many did not. There is much debate as to the purpose of inclusion. Some feel that it is a philosophy; others a placement and yet others feel that it is a program (Lombardi & Woodrum, 1999). Nonetheless, whatever rationale is applicable, inclusion in a variety of formats has been an increasingly common practice in American classrooms since the early 1990’s. Cohen and Nevin (2007) in their work Student Teacher Perspectives on Inclusive Education found that one school district in the state of Florida has been late in coming into compliance with IDEA. They noted that:

Over the past 3 years, the district has reported more and more students with disabilities who are being included in their general education classrooms for 80% of the day (Manten, 2003; Gordillo and Orlando, 2005): nearly doubling, from 23% in October 2002 to 45% in May of 2006 (Cohen & Nevin, 2007, 1).

Context
This inclusionary rate is becoming the norm in the American classroom. Given such exposure, our pre-service student teachers have been immersed in an educational system that employs varying degrees of inclusive practice. Unlike the students in the Belgian study (Vanderfaeillie, et.al., 2003), American university students in teacher education programs have experienced the impact of inclusion in basic education. Our study is designed to gauge the perceptions of our student body at various times throughout their experience in the Seton Hill University teacher education program as to their opinions of the efficacy of inclusion.

There is a generally held view in Teacher Education that once students have been exposed to inclusion, they are expected to be more positive and open toward it. But what if their exposure has not been a positive one? What if pre-service teacher education students have been exposed to veteran teachers who had negative attitudes toward inclusion? Migyanka (2006) found that there is contradictory evidence as to veteran teacher attitudes in this regard. If our pre-service teacher candidates have worked with teachers who have a negative perspective about inclusion, it is highly possible that some of our students come to our teacher education program with similar beliefs. Given that our teacher education program is an Inclusionary Practice Program, it is important that we ascertain the beliefs and attitudes of our students about the efficacy of inclusion. For, it is very important for pre-service teachers to have affirmative attitudes and beliefs toward inclusive education for its implementation to be successful. It is possible that our study will refute the above contention, that “exposure to inclusion will enable all students to have
“more positive and open” feelings about it. If that is the case, then we may have to re-examine our curriculum and program design. It will be a “reality check” for the Seton Hill University (SHU) teacher education curriculum.

Method
In this study, we intend to survey and assess the attitudes and beliefs of SHU teacher education students toward inclusion and inclusive education. We plan to identify initial student perceptions about inclusion prior to any coursework or inclusionary practice. Then students will be surveyed again after completing a minimum of nine credits in inclusionary education. In her work on teacher perception about inclusion, Migyanka (2006) noted:

Shade and Stewart (2001) surveyed general and special education pre-service teachers before and after a [an inclusion] course taught by the same teacher and found that even one course can change teacher attitudes. Campbell and Gilmore (2003) surveyed pre-service teachers before and after a unit on human development combined with field work. By the end of the semester, respondents reported a greater ability to cope and [had] significantly less discomfort, uncertainty, fear and vulnerability [about working] with children with disabilities (50).

Hopefully, we will see a similar phenomenon with our students as they progress through the program. The last benchmark will occur at the conclusion of student teaching. Student teachers will be working in inclusive classrooms throughout this experience. This final element of our study, therefore, is designed to gauge perceptual development as students have been exposed to coursework and the ultimate in field experience, student teaching.

The data from the study will be recorded and analyzed in the following categories:
- Student understanding of inclusion
- Student attitude toward the efficacy of inclusionary practice…included in this category will be student perception as to what constitutes the Least Restrictive Environment; what problems are associated with inclusion in terms of its impact on both disabled and non-disabled students
- The impact of coursework on student perception regarding the efficacy of inclusion
- The impact of practice (student teaching) on student perception regarding the efficacy of inclusion

In the end, we will test Campbell and Gilmore’s (2003) assertion that such change will occur as students are actively engaged in coursework and experiential learning. As this will be a longitudinal study, it will be interesting to ascertain the perceptual change of our teacher education students from their entrance into the program through completion. It is hoped that we will be able to determine if any change in student perception about inclusion has occurred over the life of their Seton Hill University experience.

References
Presumptions of the recalling processes activation in special needs pupils education
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Introduction
An important condition for personality functioning is the accumulation of information and its expedient reproduction that require both volition and various methods of mental activity. It condition’s the efficacy of the recalling processes that are complicated for pupils with disorders of intellectual development; That’s why, it is important to look for the ways to activate recalling processes. In the article 3-phase experimental research is presented. Activation of involuntarily memorized recalling of verbal material may be assessed as reproduction of a formerly performed action or result obtained as a consequence of the action. The research has shown that in spite of the fact that pupils with special educational needs face the range of complicated problems and it is easier for them to recall a performed action, the efficacy of the recalling of the result of the action gets better, too. The analysis of the research data allows to state that the ways of the activation of the recalling processes applied in education practice condition higher level of absorption and retention of information for pupils with special educational needs.

Context
For socially-oriented and meaningful functioning of the individual in society the assimilation of different information, primarily of expediently transferred learning material, and opportunity to use it in various activities is especially important. Rapid processes of integration of special educational needs pupils to social and educational structures (day care centers, vocational counseling and training centers, comprehensive educational institutions) condition certain changes, too. Apart from positive change in attitudes, values, and motivation for cooperative collaboration in a certain part of the society, the changes of psychological-pedagogical impact of methodological and methodical concepts are observed, and the research is necessary to manage these changes. According to various empirical researchers stating specific peculiarities of the functioning of cognitive, especially memory processes of pupils with special educational needs (primarily of persons with mental disorders) it is necessary to investigate the possibilities of the exploitation of mnemonic techniques ensuring the interrelation of the processes of activation of performance, motivation and memory.

Recalling memorized verbal material as a specific process of volitional reproduction is a complicated activity even for persons without developmental disabilities; therefore, pupils with special educational needs face even much higher interferences hindering their memory processes. Such negative segments may be not only the efficacy of recalling, the intensiveness of forgetting, the consistency of reproduction, mistakes, etc, but also the lack of motivation for certain activity, the attitudes conditioning the view about the parameters of the success of the performed task. Modeling the possibilities of the changes of the development and management of the cognitive, primarily memory’s processes of pupils with special educational needs, the search for various methods that activate the recalling process may become an important component. Constructing a hypothetical research instrument the attention partially has been paid to the process scheme of performance model by Vroom (1964), in which valency model, action model and performance model interrelate. Performance model emphasizes that achieved performance result is the function of multiplicately related ability and motivation, and in this relation great attention has been paid to the level of the tension of efforts, which would be complicated in the realization of the research task having included pupils with mental disorders into the experiment. Modifying certain components of the scheme and having applied the idea to the investigation of the activation of the recalling process (Pinskij, Juodraitis, 1985, 1996) how essential problem is analyzed, how qualitative and quantitative changes of memory processes are influenced by the necessity of the recalling of performed action and obtained result.

The aim of the research: to analyze the possibilities of the activation of recalling processes of pupils with special educational needs applying various performance models.

The objectives of the research:
1. To investigate the peculiarities of the recalling process of pupils with mental retardation and pupils without developmental disabilities applying stimulating performance models.
2. To find out the dependence of performed actions and obtained results from the modification variants of applied activation methods.
Method
Evaluating common regularities of the functioning of memory processes it is presumable that in spite of
the peculiarities of the development of pupils with mental retardation in the activation of the process of
involuntary recalling of verbal material it is possible to quantitatively and qualitatively improve the
characteristics of the efficacy of recalling.

Sample: 210 respondents (5-7 form pupils, 70 pupils of each form, who learn in special classes and to
whom mild intellectual disorders have been diagnosed) and 120 respondents (3-5 form pupils, 40 pupils
of each form, without developmental disabilities) of both genders participated in the experimental 3-phase
research.

The research: The research consisted of three experimental phases, in which different sample groups
participated in order to avoid possible automatized transference of the experience to other activities.
In the first phase of the research the respondent had to rewrite words with omitted letters from a certain
card so that a new word is made. After the performance of the task the same procedure was repeated
(immediate recalling of a performed action), word formation was also performed after 30 minutes
(delayed recalling of a performed action) and after week (the second delayed recalling of a performed
action).

In the second phase of the experiment the analogous task was given, but only after 30 minutes (delayed
recalling) and after a week (second delayed recalling) the respondent had to recall not a performed action
but its result obtained as a consequence, i.e., formed words. In the third phase of the experiment the
sequence was as follows: after the formation of words the respondent had to recall formed words
(immediate recalling of the result); and after that to form the words in writing once more (immediate
recalling of an action) from a given card. After 30 minutes and after a week these two actions (recalling
of the result and recalling of an action) were repeated with the same consistency.

The experiment was performed individually with each respondent, there were 20 schemes of words on the
card, and the recalling (primarily of the result of an action) was involuntary, because no instruction of that
kind was given to the respondents.

Findings and discussion
It is consistent that the action performed earlier; especially if it is related to the elements that stimulate
activeness, may be both the object of recalling and the means of the recalling of the result obtained as a
consequence of action. It has been stated that recalling process for the pupils with special educational
needs is also rather difficult in the first phase of the research; because it requires both sufficient volitional
mobilization and the activeness of mental performance in the formation of words. However, it should be
noticed that the input of time necessarily for such performance was constantly decreasing, which confirms
not only certain level of the realization of performance of the respondents but also quantitative changes of
the memory processes (see table 1).

Table 1: Quantitative changes of the memory processes

<table>
<thead>
<tr>
<th>Sample groups</th>
<th>Forms</th>
<th>Primary phase of the experiment</th>
<th>Immediate recalling of the action</th>
<th>Delayed (30 minutes) recalling of the action</th>
<th>Delayed (after a week) recalling of the action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pupils with mental retardation</td>
<td>V</td>
<td>9'50''</td>
<td>4'55''</td>
<td>3'45''</td>
<td>3'40''</td>
</tr>
<tr>
<td></td>
<td>VII</td>
<td>6'55''</td>
<td>3'07''</td>
<td>2'16''</td>
<td>2'10''</td>
</tr>
<tr>
<td>Pupils without developmental</td>
<td>III</td>
<td>8'17''</td>
<td>3'58''</td>
<td>3'06''</td>
<td>2'43''</td>
</tr>
<tr>
<td>disabilities</td>
<td>V</td>
<td>6'43''</td>
<td>3'07''</td>
<td>2'25''</td>
<td>2'16''</td>
</tr>
</tbody>
</table>

It is obvious that the results of all sample groups are different and it is related not only to the peculiarities
of their psychophysical development but also to age differences. It is regular that the attention should also
be paid to the components of motivation, efficacy, emotions, that in one or other way may condition
dynamic changes of the obtained research data, however, such aim had not been set. It is important that
for both sample groups the results of the recalling of the action were improving to a certain boundary of
time necessary not only for the recalling of the model of a formed word but also for its writing down, i.e.,
graphical reconstruction. Partially it conditioned the similarity of two sample groups (7 form pupils with intellectual disorders and 5 form pupils without developmental disabilities) because comprehensive school pupils paid more attention to the process of writing, to the quality of writing (accuracy, consistency etc.).

In this phase of the research the most important fact is that comparing the results of the recalling of an action of both groups in primary and final cycles they differ more than twice (statistical significance p<0.001). It should be noted that in the performed research of the activation of the recalling process the respondents of both sample groups did not follow stereotypical model of the first formed word and frequently changed it when reconstructing the performed action (word formation) and the results of the actions (formed words). It means that the recalling process of both sample groups was influenced both by interfering factors (forgetting) and by semantic transformation related to the ways of activation of mental performance. There were even five variants of the transformation of the primary word formed as a consequence of the action. In the first case it is observed how the respondent after once used word model in immediate reconstruction in other recalling of a performed action (delayed for 30 minutes and for a week) changes it and uses only the model of a newly formed word, e.g., “LAŠAS – LAŠAS – LŪSIS – LŪSIS” (Lith.).

In the second case the model of a formerly formed word changed only in the last stage, i.e., in the reconstruction delayed for a week, e.g., “LAŠAS – LAŠAS – LAŠAS – LŪSIS” (Lith.). In the third case of changing the model of the formed word it was returned to the primary variant after it had been changed in the immediate reconstruction and in the reconstructions delayed for 30 minutes, e.g. “LAŠAS – LŪSIS – LŪSIS – LAŠAS” (Lith.). Not going to the essence of all five variants of the transformations of a formed word, the dynamics of which may be evaluated as the manifestation of processes that happen for certain time it may be noticed that out of five transformation variants in the reconstruction delayed for a week only in two the primary model of a formed word has remained. The dynamics of the changes of an earlier formed word has been reflected in Table 2.

<table>
<thead>
<tr>
<th>Sample groups</th>
<th>Forms</th>
<th>Cases of the deviation from the primary word (variants of change dynamics %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I</td>
</tr>
<tr>
<td>Pupils with mental retardation</td>
<td>V</td>
<td>24,0</td>
</tr>
<tr>
<td></td>
<td>VII</td>
<td>20,0</td>
</tr>
<tr>
<td>Pupils without developmental disabilities</td>
<td>III</td>
<td>20,0</td>
</tr>
<tr>
<td></td>
<td>IV</td>
<td>16,0</td>
</tr>
</tbody>
</table>

It is regular that the number of cases of the deviations from a primary formed word model among the respondents with intellectual disorders is larger, and more variety changes were set up, as well (5 variants). Thus the representatives of the first sample group allowed to 2-3 models of former word models, while the respondents without developmental disabilities allowed no more than 1-2 word models. It could be stated that pupils with mental retardation have in fact met the requirements of the task of the recalling of the action quite successfully, having in mind qualitative and quantitative changes happening in the memory processes (recording of a performed action, its processing, specifics of decoding, etc.) and not emphasizing the target attitude to necessarily use the same model of a formed word. This circumstance should be considered as a presumption that the recalling of the performed action may also be the means activating the recalling of the obtained result as a consequence of the action, i.e., of a formed word. In fact the recalling of the obtained result as a product of the action comprises the range of complicated mental actions (dynamics of the action, situation, various obstacles, etc.), which both memorizing and voluntarily reconstructing involuntarily memorized verbal material stimulate the recalling processes.

Undoubtedly, the recalling of the result of the performed action is a significantly more complicated process than the recalling of the performed action, because it is necessary to reconstruct not only dynamic peculiarities of the action but also the word models formed (created) in this process. This activity is complicated not only for the respondents with mental retardation, but also for the pupils without developmental disorders because it requires not only appropriate motivation, volitional efforts but also
special methods of decoding that during involuntary recalling might have been very specific. In fact it has been proved because even the information accumulated in the process of voluntary recalling expeditiously reconstructing it afterwards is transformed and various mistakes (consistency, word changing, absolutely new words, etc.) are observed. The data of the recalling of the results of performance obtained in the second phase of the experimental research are presented in Table 3.

**Table 3:** Capacity average of the precisely recalled formed words’ reconstruction

<table>
<thead>
<tr>
<th>Sample groups</th>
<th>Forms</th>
<th>Average number of precisely recalled words</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Immediate reconstruction</td>
</tr>
<tr>
<td>Pupils with mental retardation</td>
<td>V</td>
<td>6,7</td>
</tr>
<tr>
<td></td>
<td>VII</td>
<td>7,3</td>
</tr>
<tr>
<td>Pupils without developmental disabilities</td>
<td>III</td>
<td>8,4</td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>9,7</td>
</tr>
</tbody>
</table>

From the obtained data it may be seen that the respondents of both groups in the process of recalling faced various difficulties because efficacy is rather low (only 5 form pupils of comprehensive school in the second reconstruction could precisely recall half of all words (51%). In all other cases the efficacy of the reconstruction of precisely recalled formed words is insufficient and to explain this fact there are several important circumstances. Undoubtedly, at first it was influenced by the specifics of involuntary recalling of verbal material and later recalling, peculiarities of short-term (ST) and long-term (LT) memory that had especially great influence to the efficacy of the reconstruction for the group of the respondents with mental retardation. The essence is that in the second phase of the research the formation of the word, its writing down and the necessity to recall them later could function in the level of interference, too. Encoding the information in long-term memory is also related to selected priorities, and in this case recalling was not only involuntary but also the priority primarily was the formation of a word but not its precise recalling. The presumption is also possible that primary activation (word formation) stimulated both semantic encoding that due to rather short time of performance and changing semantic meanings was complicated in later reconstructions and graphical (visual) encoding. The latter, i.e., graphical view of a formed word in fact was stronger as a signal, which was proved by the first stage of the experiment.

One fact is obvious that there is a significant difference between the efficacies of the recalling of both sample groups. After insignificant increase of the efficacy of the recalling in the reconstruction delayed for 30 minutes the number of precisely recalled words in the reconstruction delayed for a week (the difference of the data of 3 form pupils of comprehensive school is statistically significant p<0,02, of 5 form pupils – p<0,05). The efficacy of the recalling of the formed words of both sample groups of the respondents with mental retardation constantly decreases and the difference between 2 and 3 delayed reproductions is significant p<0,01, while comparing immediate recalling and recalling delayed for a week the difference is significant p<0,001 (5 form). The difference of efficacy of the respondents of 7 form is slightly smaller (in the delayed reconstructions the difference is statistically significant p<0,02).

In the third phase of the experimental research the respondents of both groups had to recall both performed actions and the results obtained as a consequence of the actions, i.e., formed words. It could be noticed that the time input of the respondents for the word formation was similar to the first phase of the research and every reconstruction took less time for both groups of the respondents. The important fact is that in this phase much better data of the efficacy of the recalling of the obtained result were obtained (Table 4).
Table 4: Capacity average of the precisely recalled formed words’ reconstruction

<table>
<thead>
<tr>
<th>Sample groups</th>
<th>Forms</th>
<th>Average number of precisely recalled words</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Immediate reconstruction</td>
<td>Delayed (30 minutes) reconstruction</td>
<td>Delayed (after a week) reconstruction</td>
<td></td>
</tr>
<tr>
<td>Pupils with mental retardation</td>
<td>V</td>
<td>6,4</td>
<td>9,4</td>
<td>7,9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VII</td>
<td>7,0</td>
<td>9,9</td>
<td>8,4</td>
<td></td>
</tr>
<tr>
<td>Pupils without developmental disabilities</td>
<td>III</td>
<td>8,2</td>
<td>12,3</td>
<td>10,1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>V</td>
<td>9,5</td>
<td>13,9</td>
<td>11,3</td>
<td></td>
</tr>
</tbody>
</table>

It is obvious that comparing the respondents of both groups the indicators of the efficacy of the reconstruction of precisely recalled formed words are different (statistical significance among the groups in immediate reconstruction varies from $p<0.01$ to $p<0.001$) and in fact are similar to the indicators of the efficacy of the second experimental phase.

The most important fact is that the application of activation methods conditioned the increase of the efficacy of the reconstruction both in the second reconstruction and in the third reconstruction that is delayed for a week (statistical significance of the respondents of both groups $p<0.001$). Comparing the results of the efficacy of the reconstruction obtained in the second and third experimental phases we can see significant differences namely in the delayed reconstructions. Due to the process of forgetting in the reconstruction delayed for a week the respondents of both groups recalled fewer words than in the reconstruction delayed for 30 minutes; however, in comparison to the efficacy of immediate reconstruction, the results remain higher, especially if we evaluate the data of the second and third phases in the third reconstructions separately. The data of the third phase of the research proves that both pupils without developmental disabilities and pupils with special educational needs are capable to expediently recall both a performed action and the result obtained as a consequence of the action.

It is regular that for the pupils with mental retardation it is more complicated to use the recalling of the performed action as a certain recalling way to recall the obtained result, however, the research has shown that there are all presumptions for such process. Having in mind the increase of the efficacy of the reconstruction, it is possible to state that in a repeated process of the reconstruction of the action and of the obtained result the respondents of both groups realized that there is interrelation between these two performed actions and that the dynamics of recalled actions in the formation of words stimulates the process of the recalling of words themselves. The analysis of the obtained data allows stating that the ways of the activation of the recalling processes applied in pedagogical practice (in fact this process after its modification suits in other activity spheres, too, e.g., in vocational training, in the formation of skills of social behavior, etc.) condition the higher level of absorption and retention of information of pupils with special educational needs.

Conclusions
1. The recalling of involuntarily memorized verbal material for pupils with mental retardation is a complicated activity and requires many volitional efforts, because of specific memory peculiarities conditioning low level of the efficacy and precision of reconstructed information.
2. The ways of improving recalling activity can stimulate the dynamics of pupils’ memory processes and condition the higher level of different information’s absorption and retention.
3. The recalling of the performed actions and the results obtained as a consequence of the action ensures a better level of the recalling of the reconstructed information and in spite of manifesting differences between pupils without developmental disabilities and the respondents with mental retardation may be an efficient means in the stimulation of the activity of cognitive processes.

References
Using music activities to improve the attention span and language ability of three young autistic children
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Chaoyang University of Technology, Taiwan

Background
Music is everywhere you look, providing stimulation, enjoyment and cultural awareness. It is a powerful tool that can help calm and relax emotions and relieve stress. The acceptance and the application of music are broad. For young special needs children, it can help to enhance language ability, promote attention span and improve social skills. With the enactment of the “Individuals with Disabilities Education Act” in the United States in 1997, music educators began to seek new ways to promote inclusion and educate special-needs students in a less restrictive environment (Turnbull, Turnbull, Shank, Smith, & Leal, 2002). To achieve these goals the efficacy of music therapy programs has been investigated with a wide range of children, including autistics (Wager, 2000). Although in Taiwan, music therapy is not all-pervasive, music educators still consider it important.

Through previous study (Lee, 2006; Lee, Chan, Ho & Lin, 2006; Lee, Chan, Ho, Cheng & Su, 2005; Lee, 2004) and instruction, the researcher has seen positive effects from developmentally challenged children being given the opportunity to interact and experiment with musical instruments, both simple and complex. This group is in great need of encouragement and effective learning activities to help develop language abilities and proper pronunciation skills. Any educational activity that can supplement existing methods for communication development should be explored.

Link between autistic children and music
It has been demonstrated that while autistic children will not usually respond to the emotional aspects of speech, they will respond emotionally to music (Heaton, Hermelin, & Pring, 1999). Studies show music and music therapy techniques to have significant, positive influences in the treatment of autism. Music activities have encouraged purposeful interaction by offering a non-verbal and non-threatening form of intervention (Hooper, 2002). A number of studies (Lee, 2004; Wagner, 2000) suggest that autistic children respond more frequently, appropriately, and with more pleasure to music than to any other auditory stimulus. Buday (1995) reported better memory for manual signs with autistic children in music condition training. He described the results representing a potential first step in using music within a simultaneous communication context to promote better pragmatic skills with autistic children.

Music therapy is particularly effective in the development and remediation of speech. The severe deficit in communication observed among autistic children includes expressive speech, which may be nonexistent or impersonal. Speech can range from complete mutism to grunts, cries, explosive shrieks, guttural sounds and humming. There may be musically intoned vocalizations with some consonant-vowel combinations, a sophisticated babbling interspersed with vaguely recognizable word-like sounds, or a seemingly foreign sounding jargon. The use of music therapy to aid communication focuses on processes involved in creating speech and stimulating the brain in the areas of conceptualization, symbolization and comprehension (Bettison, 1996).

Many properties are shared by music and speech. For example, the perception of both requires distinguishing among different sounds and timbres, pitches, intensities, durations and how over time the sounds change. This helps the listener to develop the ability to attach meaning and interpret the sounds. The traditional compliment of techniques for auditory training can be enhanced through the alternative, pleasing tools of music therapy and music activities.

Through music, autistic children can increase the inventory of hand gestures they are capable of imitating (Braithwaite & Sigafoos, 1998; Buday, 1995). Individuals with autism show equal or increased abilities in pitch processing including memory, labeling and categorization in addition to high preference for music when compared to typically developing peers. Preliminary findings from clinical studies show potential for interactive music strategies to enhance areas such as communication and socialization (Bonnel, et al., 2003). People with autism spectrum disorders (ASD) have difficulties with communication, behavior and/or social interaction. Music therapy uses music and its elements to enable people to communicate and to express their feelings. In this way music therapy addresses some of the core problems of people with ASD. Three small studies were included which examined the short-term effect of brief music therapy interventions for autistic children. Music therapy was superior to "placebo" therapy with respect to verbal
and gestural communicative skills, but it was uncertain whether there was an effect on behavioral outcomes (Gold, Wigram, Elefant, 2006).

**Method**

The main goal of the study is to enhance the learning experiences of young autistic children. According to Barlow, Haynes, and Nelson (1986), the multiple baseline is probably one of the best designs available for practitioners. It is relatively simple, withdrawal is not required, and applied opportunities for its use abound once systematic measures are being taken (Barlow, et al. 1986). Due to the number of differences among the individuals, the study chose a multiple-baseline across individuals design model using both qualitative and quantitative methods to obtain the results.

The purpose of the study is to examine the use of music activities in helping to improve attention span and language ability in this critical group. The specific research questions asked are:

1. Can young autistic children enhance their attention span through music activities?
2. Can young autistic children be motivated to make sounds through the use of musical instruments?
3. Can young autistic children be motivated to say one word through the use of musical instruments?
4. Can young autistic children be motivated to engage in simple conversation through the use of musical instruments?

**Sample**

Three 4-5 year-old subjects enrolled in a private kindergarten in Taichung, central Taiwan, were selected by purposive sampling to take part in the experiment. These students all had been clinically diagnosed with autism.

**Duration**

This was a 20-week study, with 40-minute sessions once per week of specific, study-focused music education lessons. The initial four weeks of the study were dedicated to baseline observation.

**Research Design**

A multiple baseline research design across participants was used in the research. All observations of participants undertaken during baseline and intervention phases were recorded on videotape.

![Figure 1: Research design](image)

**Baseline**

In assessing the participants’ initial behavior, the number of observations for each participant varied due to the research design. For Participant 1, there were four baseline observations, for Participant 2, six, for Participant 3, eight. Each observation session was 30 minutes in length. Hence, the total amount of observation time varied for each participant, ranging from 2 hours (Participant 1) to 4 hours (Participant 3). During baseline, participants were observed in their regular school-day group activities. The baseline observations concluded in each case when the observers were in agreement about the specific nature of each participant’s behavioral and developmental challenges.

**Intervention**

From figure 1 we can see that there were different forms of interventions: Intervention I of Attention Span (4 times), Intervention II of Making Sounds (2 times), Intervention III of Speaking one word (4 times) and Intervention IV of speaking simple sentences (6 times). Prior to the start of the formal curriculum, one free-play musical instrument session was held where each student was given the opportunity to choose unprompted musical instruments that they found attractive for whatever reason (table 1). Their preferences were used during activities and throughout the program. Mandarin Chinese was used for curriculum, materials and all target sounds and words.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Participant’s Preference Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-year-old, female, autism along with developmental delay</td>
<td>Rattles &amp; Hand-bell A</td>
</tr>
<tr>
<td>4.2 year-old, male, autism along with developmental delay</td>
<td>Bells</td>
</tr>
<tr>
<td>5-year-old, male, autism along with developmental delay</td>
<td>Different kind of Drums</td>
</tr>
</tbody>
</table>

**Experimental phase 1**
The main goal of this stage was to attract children’s learning attention by playing different instruments. Curriculum design as shown in table 2 included a “Hello Song,” “Attendance Song,” “Musical Storytelling,” “Relaxation Time” and “Goodbye Song.”

**Table 2: Curriculum design of phase 1**

<table>
<thead>
<tr>
<th>Musical Activities</th>
<th>Instruments used</th>
<th>Target Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hello Song</td>
<td>Guitar</td>
<td>Hearing the sound of a guitar and becoming familiar with the song to develop children’s concept that music class is starting, and focus attention on the instructor.</td>
</tr>
<tr>
<td>Attendance Song</td>
<td>Participant’s preferred instruments</td>
<td>By playing children’s preferred instruments, they will pay attention to the activity.</td>
</tr>
<tr>
<td>Musical Storytelling</td>
<td>Sound effect instruments</td>
<td>By playing different sound-effect instruments, children will be more attentive in the class.</td>
</tr>
<tr>
<td>Relaxation Time</td>
<td>Recorded music by researcher</td>
<td>By listening to the recorded music, children will calm down after the class activities.</td>
</tr>
<tr>
<td>Goodbye Song</td>
<td>Guitar</td>
<td>Develop children’s concept that music class is ending.</td>
</tr>
</tbody>
</table>

**Experimental phase 2**
The main goal of this stage was to promote children’s language ability, specifically in making sounds. Curriculum design as shown in table 3 included:

**Table 3: Curriculum design of phase 2**

<table>
<thead>
<tr>
<th>Musical Activities</th>
<th>Instruments used</th>
<th>Target Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hello Song</td>
<td>Guitar</td>
<td>Children would be able to do the sound echo part of the song.</td>
</tr>
<tr>
<td>Attendance Song</td>
<td>Participant’s preferred instruments</td>
<td>By playing children’s preferred instruments, they would be able to echo sounds of instruments.</td>
</tr>
<tr>
<td>Sound Games</td>
<td>String instrument: Nan-Hu Blown instruments: recorder, slide-whistle, etc.</td>
<td>By playing the Nan-Hu, children would imitate, make nonsense sounds and different sounds. By playing the blown instruments, children could form more correct lip shapes</td>
</tr>
<tr>
<td>Relaxation Time</td>
<td>Singing soft sound song accompanied by guitar</td>
<td>By listening to the song, children would be able calm down after the class activities.</td>
</tr>
<tr>
<td>Goodbye Song</td>
<td>Guitar</td>
<td>Develop children’s concept that the music class is coming to an end.</td>
</tr>
</tbody>
</table>
**Experimental phase 3**
The main goal of this stage is to promote children’s language ability in speaking one word. Curriculum design as shown in table 4 included:

<table>
<thead>
<tr>
<th>Musical Activities</th>
<th>Instruments used</th>
<th>Target Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hello Song</td>
<td>Guitar</td>
<td>Children would be able to echo one word</td>
</tr>
<tr>
<td>Attendance Song</td>
<td>Participant’s preference Instruments</td>
<td>By playing children’s preferred instruments, they would be able to echo one sound related to the sound of the instruments.</td>
</tr>
<tr>
<td>Sound Games</td>
<td>String instrument: Nan-Hu</td>
<td>By playing the Nan-Hu, children could make nonsense sounds and imitate the instrument’s sound.</td>
</tr>
<tr>
<td>Relaxation Time</td>
<td>Singing lullaby accompanied by guitar</td>
<td>By listening to the lullaby, children would calm down after the class activities.</td>
</tr>
<tr>
<td>Goodbye Song</td>
<td>Guitar</td>
<td>Children would be able to sing one word.</td>
</tr>
</tbody>
</table>

**Experimental phase 4**
The main goal of this stage is to promote children’s language ability, and be able to have a simple conversation. Curriculum design as shown in table 5 included:

<table>
<thead>
<tr>
<th>Musical Activities</th>
<th>Instruments used</th>
<th>Target Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hello Song</td>
<td>Guitar</td>
<td>Children would be able to sing a simple greeting sentence.</td>
</tr>
<tr>
<td>Attendance Song</td>
<td>Participant’s preferred instruments</td>
<td>Children respond to prompts by saying “Here I am” and playing their preferred instruments.</td>
</tr>
<tr>
<td>Singing Activities, Movement &amp; Musical Storytelling</td>
<td>Pitched &amp; unpitched instruments, i.e. sound effect instruments, castanets, bells, xylophone</td>
<td>By participating in different activities, children would be able to imitate and learn simple sentences.</td>
</tr>
<tr>
<td>Relaxation Time</td>
<td>Listening to recorded soft music</td>
<td>By listening to the recorded music, children would calm down after the class activities.</td>
</tr>
<tr>
<td>Goodbye Song</td>
<td>Guitar</td>
<td>Learning a simple greeting sentence, such as “See you next time, goodbye,” etc.</td>
</tr>
</tbody>
</table>

**Assessment** The assessment instruments included a pre-test and post-test conducted by a medical doctor, semi-structured observation forms to gather data on attention span and language ability from three observers, and interview reports from the teachers and the parents. All intervention sessions were recorded on video and these were viewed and scored by three observers. The pre-test and post-test were conducted by a pediatric physician at a local hospital. The observation session was conducted by three observers: three trained graduate students. Interview reports were conducted by the three participants’ parents and teachers. At the end of the study, three social reliability assessment reports were completed by a parent, a teacher and the school’s principal.
Results

Pre-test and post-test expert assessment

The comparison of pre-test and post-test is shown in figure 1. Participants were scored on a “1-5” scale on a range of aspects related to attention span and language ability. For attention span, a score of “1” indicated the participant was able to pay attention less than 40% of the time across 10 categories. A score of “5” indicated the participant paid full attention 100% of the time. For language ability, a score of “1” indicated the participant had less than 40% proficiency across 10 categories, such as the ability to make sounds, verbalize one word and speak in simple sentences. A score of “5” showed the participant had full, 100% proficiency.

The first part (“A”) shows assessment of the three participants’ attention span. The S1 is from 0.5 to 3, the S2 is from 1 to 3.5, and the S3 is from 1 to 4. It shows the efficiency of the study. The second part (“B”) shows three participant’s language ability to make vocal sounds. The S1 increased from 1 to 3.5, S2, from 1 to 4, and S3, from 1 to 3.5. The third part (“C”) shows the three participants’ language ability: speaking one word. The S1 increased from 1 to 3.5, S2 from 1 to 4, and S3 is from 1 to 3.5. The fourth part (“D”) shows the three participants’ language ability: speaking sentences. All three participants increased their scores from 1 to 3.

Observation forms and interview reports

For participant 1, there were four baseline observations. According to the parents (API 2005810: Participant A’s Parental Interview 2005810) and the teacher (TII20050807: Participant A’s Teacher Interview 2005807), participant 1 had no language ability and had an attention problem. At the second, third and fourth observation, when the three observers’ baseline observations were in agreement and had matching assessment scores, the participant moved to intervention I phase. At this phase, the participant’s attention span was shown to be improving. Both the teacher’s (ATOF 20051005: Participant A’s Teacher Observation Form: 20051005) and parents’ observation (APOF 20051005: Participant A’s Parent Observation Form: 20051005) reports showed that the participant was attracted to the instruments and musical storytelling. From the record of the three observers’ observation forms, the participant soon reached the goal of improving attention span.

At intervention II – improving language ability – the participant was able to make sounds by listening to pitched instruments, especially the Nan-Hu. According to the teacher’s report (ATOF 20051102), she liked to play the hand-bell A and make nonsense vowel sounds, i.e. “a,” “u.” According to her parental report (APOF 20051109), she liked to sing the “a” sound while reading a storybook. After participant 1 showed stability, she moved to next phase: speaking one word. At this phase, the participant liked to say “u” while rounding her lips (APOF 20051123). At the last phase of the intervention, the researcher attempted to encourage simple conversation. At the end of the study, he was able to verbalize simple sentences, such as, “Thank you,” “Goodbye,” etc. (APOF 20060118).

For participant 2, there were six baseline observations. According to the parents (BPI 2005810) and the teacher (BTI20050807), participant 2 had attention problems and did not want to talk (he could speak, but...
not clearly). At intervention I, the parents’ reports (BPOF 20050921) showed that participant 2 liked the sound effects used in musical storytelling activities the most. At home, the participant would ask for storytelling along with some sound effects (BPOF 20051019). At school, the participant would pay more attention to the teacher while listening to a story along with sound effects during the school day (BTOF 20051026). At intervention II, participant 2 liked to express the high and low sounds of the pitched instruments, such as nan-hu and cello, through representational high and low body movement (BTOF 20051121). At intervention III, the participant could say the words “thanks” and “yes” (BPOF 20051121). At intervention IV, the participant was able to say simple sentences, such as, “Let’s go,” “Thank you,” etc. (BPOF 20060118).

For participant 3, there were eight baseline observations. According to the parents (CPI 2005810) and the teacher (CTI 20050807), participant 3 did not want to talk (he could speak, but not clearly) and had attention problems. At intervention I, the participant had high interest in instrument sounds and sound effect. The reports by the three observers’ also showed participant 3 had high scores for attention while listening to stories and engaging in musical role play. While singing the “Hello Song,” he would be attracted by the sound of the guitar (CTOF 20051102; CROF 20051102). “Attendance Song” received his attention when accompanied by playing his favorite instrument, the ocean drum (CROF 20051116, CTOF 20051116). At intervention II, he could make sounds by playing the string instruments and correct his pronunciation by playing a pitch pipe (CROF 20051123). At home the parents continued this method to improve his pronunciation (CPOF 20051123). At intervention III, participant 3 was able to say one word easily (CTOF 20051214). At home, the instruments, especially toy horn instruments, were the reinforcement to motivate his speaking (CPOF 20051221). At intervention IV, the participant was able to say “How are you,” “Thank you,” “I don’t want” to the teacher (CTOF 20060118).
Reliability In order to establish the reliability of the study, there were three observers. The consistency of scores for attention span and language ability is .8702; therefore, this study is reliable.

Social Validity In order to support the validity of the study, a feedback form was used by the principal, a teacher and a parent. The reliability for the study is .8824. All respondents gave positive support for the study, and scored various aspects on a “1-5” scale. A score of “1” for questions in the “goals” section indicate that the respondent strongly disagreed with whether a goal of the study had been met; a score of “5” showed that they strongly agreed that a goal had been met. There were 11 scores of “5,” four scores of “4” (agree), no disagree and no strongly disagree scores.

For language ability, respondents gave a score of “1” if they felt the participant had shown a high level of regression in an area of language ability; they gave “5” scores if they observed that the participants had made a high level of progress. There was one score of “5” recorded, 14 scores of “4” for progress, and no scores indicating the parent, teacher and principal felt participants had made fair progress, or had regressed (no “1” to “3” scores). For attention span, the “1 – 5” scale was again used to register progress; with a “1” score indicating a high level of regression, and a “5” score showing that the participants were felt to have made a high level of progress. Fifteen “4” scores showed it was believed that the participants had made progress. Along with no “5” scores, there were no scores recorded for “1,” “2,” or “3” (high level of regression, regression, or fair progress).

Implications for further study
According to the report forms from interviews with the parents and teachers at the beginning and at the end, and the results shown in Figure 1 from three observers, all three participants made positive progress. The three autistic children enhanced their attention span through the music activities. They were motivated to make sounds through the use of musical instruments. They were also motivated to verbalize one word and engage in simple conversation through the use of musical instruments.

The results of this research provide support for the efficacy of music activities in motivating attention span and improving the language ability of autistic children. Further, the study was able to prove the non-threatening environment that can be created in a music-therapy setting is invaluable in providing the opportunity for autistic children’s learning.

The findings of the study are: 1. Storytelling accompanied by sound effects could be a useful tool for enhancing the attention span of autistic children. 2. Horns can also be very productive in teaching the production of certain phonemes. Blowing musical instruments or whistles can be helpful for lip-rounding skills. 3. Sound effect instruments, such as rain sticks, ocean drums, thunder tubes, and bird whistles, could motivate and attract children’s attention.

Suggestions for further study: 1. Adapt western music therapy methods to the local culture in Taiwan. For example the horn, trombone, and string instruments are excellent tools for teaching pronunciation of Chinese words. 2. Establish a curriculum model for teachers of special needs children. In Taiwan, music therapy is a vastly underutilized tool for working with children with developmental disabilities. It is hoped through this study and further research that more attention will be paid to the possibilities that exist for using music to reach and benefit the learning of these children.

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Introduction
The importance of Pedagogical Psychological Services in the field of rendering the services of special education and psychopedagogical support is evident. In Lithuania, psychopedagogical support is provided in three levels. The first-level aid is provided by the Board of Special Education (hereinafter BSE) at school. The objectives of the Board are: to perform an initial assessment of special educational needs one requires, to organise the educational process for persons with special educational needs, as well as to consult the child’s parents and pedagogues and to provide them with recommendations on educational programmes and patterns. The members of BSE are teachers and different professionals such as special pedagogues, speech therapists, social pedagogues and psychologists provide consultative services. Special pedagogues and speech therapists are more concerned about the assessment of child’s special educational needs; they also provide recommendations for parents and teachers working with the child.

The second-level support (level of local authorities) is provided by the Pedagogical Psychological Services (PPS). The mission of PPS is to render services of special, pedagogical and psychological support for the children and their parents as well as educational and other child-care institutions. PPS’ specialists (psychologists, special pedagogues, speech therapists, social pedagogues, neurologists) work in a team while cooperating with the child’s parents, teachers and other professionals. The functions of PPS are: to assess one’s abilities and disabilities; they also recommend special education; to consult with parents, teachers and specialists; to provide teachers, specialists and parents with methodical means to meet the child’s needs; and to establish of new educational institutions. The Centre of Special Pedagogy and Psychology, the third-level support institution, develops the strategy of special as well as pedagogic and psychological support on the national level, performs its implementation and supervision as well as provides local PPS with methodical help.

Essential changes in Lithuanian tuition policy and educational practice throughout the last decade have considerably influenced the objectives and objects as well as methods and planning of psychopedagogical child’s assessment including support rendering and other activities. One of the most significant changes is the fact that education of children with special needs has become a part of general educational system, i.e. a process of integrative education has begun. The mission, objectives and functions of PPS have changed after validating afore mentioned three-level model of psychopedagogical support and extension of PPS net throughout Lithuania.

However, PPS potential to meet the needs of educational institutions are limited due to insufficient funding as well as poor methodical and material supply. The demand of children and other participants of the educational process (teachers, parents) for psychological support are not properly met due to the deficiency of psychologists in PPS and educational institutions. Undefined and controversial methodical bases of PPS do not assist in a proper PPS functioning either. Disorders and theoretical norms dominate in psychopedagogical assessment of the child. The core of the assessment is the child’s disability; the analysis of situation/context of the child’s/person’s disability as well as systemic examination of the disabling environment does not meet a proper consideration whereas cooperation of the participants of the educational process and assessment of their competences and needs are rather neglected. Such priorities of the assessment do not comply with the concept of empowering as they do not motivate the participants of the educational process (pedagogues and parents in particular) to take responsibilities (Epstein, 2001) or manage problematic situations, actualise and realise their competences and aspire after greater independency (Leonardsen, 2006, Lee, 1996; Morris, 1997; Bossé ir Lavalée, 1993). Negative assessment as well as negative professional consideration of the child with special educational needs and disbelief in his/her abilities negatively influence self-perception and development of the child with special educational needs, reduce potential abilities in social participation and extend risks of social exclusion. On the contrary, when the participants of the educational process feel that they are appreciated and respected as personalities with certain knowledge and abilities (actual recourses) acknowledged by the specialists as potential to bias the development of a plan that could help, they could develop a certain strategy together. The aim of such model (regarded as to *strength based practice* in literature) is to reinforce the possessed skills and self-esteem (Dunst et al., 1994, cited by Green, McAllister, Tarte, 2004). Certain aspects of collaboration significantly influence a quality performance of PPS functions. However, the analysis of the functions and principles realised by PPS reveals that the priorities indicated and oriented at by the specialists of PPS are not always conducive to the development of partnership and social participation. We approve of the paradox described by Leonardsen (2006): despite their dignified intentions, the modern programmes for social welfare disempower the people with special needs and
strengthen their dependency on other people or institutions instead of empowering them and searching for their inner abilities.

The research question: How do the participants of the educational process (parents, pedagogues, school specialists, professionals from PPS) assess the functions and priorities of PPS? Do the participants of the educational process need any changes and how do the expectations vary in respect to different participants of the process? The objective of the research is to identify the priorities of Pedagogical Psychological Services. The research is to reveal the differences indicated by various participants of the psychopedagogical assessment and educational process (professionals at PPS, parents, teachers and specialists) in assessing the performance and functions of PPS and defying their priorities.

With regard to the operationalization of the research objective, a structured questionnaire of a closed character has been completed. The structure of the questionnaire reflects both PPS functions and methodological positions. The questionnaire contains 12 diagnostic blocks and 123 features. All the participants (PPS professionals, members of BSE and parents) have been asked the same questions (identical diagnostic blocks and features). Asking different groups of respondents the same questions has helped to identify their opinions and evaluation as well as assisted in drawing comparisons. While comparing the opinions of the respondents, a lot of complimentary data has been gathered proving that the functions of PPS are not single-sided static issues; these are composed (a construct) of different expectations, opinions and assessment of the participants, i.e. the functions are constructed, realised and assessed by the participant collaboratively.

Method

Sample 429 school representatives (pedagogues and specialists) as well as 109 parents and 171 PPS professionals participated in the study.

In order to reveal the actual structure of PPS functions, the procedure of statistic factorial analysis has been undertaken. The actual structure of the PPS functions is regarded as a single composition of formal, theoretical (in regard to the concept of the study based on the theory of empowering) and empirical definitions of the PPS functions. While analysing the respondents’ answers on PPS functions, 19 PPS functions have been identified and these represent all essential fields of the PPS activities (table 1).

Table 1: PPS functions

<table>
<thead>
<tr>
<th>PPS’ activities</th>
<th>PPS’ functions</th>
<th>Features</th>
<th>Samples of PPS’ functions’ features (statements of questionnaire)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment</td>
<td>Assessment as analysis of situation and participants’ demands</td>
<td>6</td>
<td>Pedagogues’ needs are evaluated in PPS</td>
</tr>
<tr>
<td></td>
<td>Assessment as child’s analysis</td>
<td>4</td>
<td>Child’s special needs are assessed</td>
</tr>
<tr>
<td></td>
<td>General (with all participants) discussion about assessment results</td>
<td>7</td>
<td>All participants can convey their opinion</td>
</tr>
<tr>
<td></td>
<td>Practical benefits of recommendations (for parents, child, teachers)</td>
<td>6</td>
<td>Support means for a child are offered in recommendation</td>
</tr>
<tr>
<td>Recommendations</td>
<td>Initiative of participants in developing recommendations</td>
<td>4</td>
<td>A child can suggest his/her own opinion how in developing recommendations</td>
</tr>
<tr>
<td></td>
<td>Participation of other participants in developing recommendations</td>
<td>4</td>
<td>PPS asks parents to participate in developing recommendations</td>
</tr>
<tr>
<td>Documents</td>
<td>Official documents regarded as the means of individual support</td>
<td>8</td>
<td>Families capacities are revealed in school official documents</td>
</tr>
<tr>
<td>Relations between PPS and school</td>
<td>Equivalent and constructive partnership of PPS and school</td>
<td>14</td>
<td>PPS specialists together with teachers look for appropriate means in working with children with special educational</td>
</tr>
<tr>
<td></td>
<td>PPC as a recourse of programs’ implementation</td>
<td>2</td>
<td>PPS specialists help teachers to adapt and modify programs</td>
</tr>
<tr>
<td>Relationship between PPS and families</td>
<td>PPC as a recourse of emotional relations and competencies</td>
<td>14</td>
<td>PPS specialists explain parents the reasons of child’s problems at school</td>
</tr>
<tr>
<td>Teaching/learning to be</td>
<td>PPS sharing experience with schools, learning together</td>
<td>8</td>
<td>PPS specialist discuss with schools administration about support means for children with special needs</td>
</tr>
</tbody>
</table>
open to a new experience
Initiatives of parents’ self-education 2

Parents initiates informal discussions, invites specialist to participate during discussions

Support coordination

Succession of support at PPS 4

PPS specialists observe children who where assessed in PPS

Acknowledgement of teachers’ competences, his/her activities with children with special needs. 3

Teachers know how o work with children with special educational needs

An individual program as coordination of all participants’ demands, capacities 4

Individual educational programs are developed by all participants (parents, child, teachers, specialists)

Time arrangement

Time arrangement and it’s distribution 5

Time for assessment is arranged purposefully

Mobility

PPS’ mobility 2

PPS specialist assesses children and consults at schools

Information

Clearness and accessibility of information about PPS activities 4

Parents know what kind of support they can expect in PPS

Initiatives and means of information about PPS activities 3

PPS specialists can consult parents using IT

Factors of organisation

The following tendencies have been revealed from the questionnaires data:
Function of assessment is being realised in practice with some controversy. According to PPS professionals, the functions of assessment are properly performed by PPS. The child’s assessment in respect of different issues is regarded by the participants most favourably. Whereas all the fields in assessing the situation of disability and involving all the participants into the process of assessment and discussions of the results need more attention. The assessment of the child’s situation in a family and assessment of the family itself is slightly developed. All the respondents mentioned this as a mostly neglected issue; they also noted insufficient involvement of other participants, however, these fields are not regarded as potential to be developed by the majority of the respondents.

All participants emphasize actual benefits of recommendations while assisting teachers and children both at school and in the family. School specialists and teachers happen to experience the most benefits of the recommendations. The parents and pedagogues believe that the most important is to pay attention to the recommendations considering the assistance for children at home and practical advice for teacher how to work with a child. Majority expects PPS to issue specific indications to assist in solving problematic situations; PPS is regarded as an expert. The respondents also indicate parents’, teachers’ and children’s poor initiative and involvement as well as participation in developing recommendation (figure 1).

Parents participate in developing recommendations

PPC invites parents to participate in developing recommendations

Parents suggest themselves to participate in creating recommendations

A child suggests himself to participate in creating recommendations

A child gives suggestions for recommendations

Figure 1: Evaluation of parents’ and children’ involvement and demand for changes

*Relations between PPS and schools. In PPS activities, the respondents usually face a friendly contact between PPS professionals and schools; teachers’ understanding the messages conveyed by PPS specialists and recommendations of PPS professionals on work with children with special needs. In comparison with the rest of the respondents, PPS professionals regard the relationship between schools and PPS more favourably and they are not apt to any changes. School representatives are not prone to changes either except the field considering assistance of PPS professionals in adapting and modifying curricula at school. 
• **Relationship between PPS and families.** PPS may and partly is recourse of emotional relations and competencies for parents. According to the respondents, the structure of relationship between PPS and families is defined as listening to parents and children; considerate communication with parents and assisting parents in understanding the reasons of difficulties which the child experiences at school. Parents’ encouragement of their initiative and involvement is mostly neglected in the field of relationship between PPS and families.

• **Teaching/learning to be open** to a new experience is defined by the fields of **PPS sharing experience with schools, learning together or initiatives of parents’ self-education.** PPS professionals are convinced that these fields are properly realised and expended. According to the parents, the dialogue between PPS professionals and school administration could be improved considering the assistance in helping children with special needs at school and sharing PPS experience. Parents and PPS do not share their knowledge; parents’ initiative in self-education is particular significant.

• **Rendering support** receives different evaluation from the respondents. The belief of PPS professionals is that different aspects of support rendering are being performed in practise thus there is no need for any cardinal changes except the field of developing individual programmes. Whereas the parents denote that the aspects regarding continuity and developing individual programmes as well as encouraging teachers to work with children with special needs do not receive PPS’s proper attention. The problem of development individual programmes is relevant. The majority of the respondents are convinced that all the fields regarding the preparation of individual programmes are neglected and require some changes.

• **Factors of organisation** (information about services provided, PPS mobility, time arrangements). In PPS activities, information about the services provided by PPS, its clarity and accessibility as well as the variety of informative means is not the one of the PPS’s strengths. PPS lack meetings at schools as well as consultations provided by PPS professionals by IT means. PPS professionals are most positive about the tendencies in time arrangements and balanced assignments. Similar tendencies may be observed in regard to PPS’s mobility.

Having compared the evaluations, the assessing ratings of actual and needed realization of PPS functions has been accomplished (figure 2).

The best evaluation has been received upon the **assessment of the child’s characteristics analyses** (M=2.42). That implies that the respondents face the realisations of this function in PPS’s activities quite often. Very seldom have the respondents faced the realisation of the following PPS functions: the **initiative of participants in developing recommendations** (M=1.2); the **initiative of parents’ self-education** (M=1.38); others’ participants’ participation in developing recommendations (M=1.5). The indicated functions are not realised properly and require significant changes, according to the respondents.

While analysing the respondents’ opinions, different tendencies in assessing the actual situation and needs may be observed. Rather significant differences have been observed in the respondents (parents, PPS professionals and school representatives) assessing the actual situation and needs in the functions performed by PPS. The differences in parent’s and PPS professionals’ attitudes towards the assessment of the actual status of the function rendering are noted in the vast majority of the cases (except the fields regarding involvement, participation and initiatives of other participants). PPS professionals regard the actual function rendering the most favourably. Whereas the worst evaluation of the actual function rendering is received from parents who are more apt to the changes in realising various PPS functions than other participants. Evaluations by school representatives and PPS professionals differ, particularly in the fields regarding the relations between schools and PPS, assessments and issuing of recommendations. The parents and school representatives are more prone to changes in the indicated fields (except assessment functions) than PPS professionals are. Majority of the respondents has noted that the fields of PPS functions regarding involvement and initiatives from the participants is most neglected and thus have the greatest need to be developed. The functions regarding outer factors and PPS child’s assessment are rendered most successfully. The assessment is definitely the most successfully actualised activity both in practice and formal documents.
Discussion

The study has indicated certain factors of PPS activity which allow to regard PPS as possible recourse of psychopedagogical support for children, parents and school: detailed and comprehensive assessments of a child have been accomplished, traces of successful mediation of PPS in collaboration between the participants of the process and formal institutions have need noticed, there also have been successful involvements of children and their parents into the process of assessment as legitimate participants observed etc. PPS may become a real resource and support for the families provided that the involvement of participants as well as partnership and empowering are encouraged.

This may be realised through the revelation and improvement of the participants’ entering the educational process competences. Foremost, the attitudes towards a child have to be changed. The disability should be emphasised whereas the child’s knowledge, abilities, skills, motives, interests and needs as well as his/her recourses have to be pointed out, strengthened and utilized. Instead of emphasizing parental passivity and lack of understanding, their ability to cognise their child, listen to him/her, understand them and support them as well as possibility to spend some time with their children and observe them in casual situations and many other activities have to be encouraged. Instead of pedagogues’ pessimism (about the child’s ability to learn, change etc) and stereotyped adjustment of the programmes for the child, should occur the demand for new approach and ability to foresee the child’s progress as well as educational abilities both for parents and children. Instead of emphasising the child’s disorders, which is imputed by PPS professionals, accentuating the child’s abilities and education capabilities as well as utilising competences of all participants (parents, pedagogues, school specialists and children) for the common sake have to be highly considered.

PPS is a support rendering organisation rather oriented towards the pedagogues and school than a child or family. Parents and children do not actually collaborate in the course of psychopedagogical assessment or educational process; needs and expectations of parents are not properly considered. While involving children and their parents as equal partners into the process of assessment and education, the potencies of the children and parents are not properly utilised. The involvement is rather formal; in reality, parents and children act rather as passive listeners than experts of the situation during the process of assessment, discussion of the results and issuance of solutions. In order PPS to become an organisation rendering support for children and families, they have to involve children and parents into the process of assessment.
and education on equal bases. The expectations and needs of children and parents are not only to be
listened to but also registered in the documents (i.e. what the participants expect from PPS, what their
approach towards the problem is, how they expect the problem to be solved, what role they take in
solving the problem etc.).

Partnership between the participants of psychopedagogical and educational process and institutions is
also very important. The relationship between the participants and institutions are not based on the
principals of partnership. Their contact may be regarded as relations of consumers (one expects to receive
an end-product, some “prescription”), experts (the opinion of professionals is more important than child’s
or parents’) or defence (one does not take responsibility for certain actions or decisions; they expect
somebody else to be responsible).

Hierarchy in inter-institutional and interpersonal communication should vanish as well as power relations
(Foucault, 1991) and partnership should take their place. Partnership cannot exist in the system of experts
and clients; it may only flourish in the vibes of different recourses (competences). Partnership occurs
when the participant-experts in the process of psychopedagogical assessment and education generate
common goals for psychopedagogical support, estimate their objectives, share duties and responsibilities
and search for new recourses (Dowling, Powell, Glendinning, 2004). It is only possible when the dialogue
between different participants of educational process is open and parents, children and pedagogues are
legitimate participants in that dialogue (Roberts, 2005).

PPS do not properly utilise the factors facilitating organizational work and considerably assisting in
accessibility of services provided by PPS including involvement and empowering. The flexibility of PPS
(in comprising different rhythms of participants), their mobility (performing more PPS functions in the
educational institutions) as well as variety of means in spreading information about the services provided
by PPS may assist both in expanding the informational net and converting PPS into an open, self-critical
and learning institution.

One of the most significant and specific PPS functions is a detailed and comprehensive
psychopedagogical assessment revealing different educational recourses, abilities and competences;
however, PPS is an evident network which existence may and has to be based on the performance of
legitimate participants (both people and institutions) that are a part of the network taking their
responsibilities and possessing their competences, which may be efficiently realised through the function
of mediation. This function is rendered through coordination of expectations, needs and interests of the
participating in the educational process, exchange of their recourses and competences, creation of
network and its supervision as well as establishing tendencies for continuous assistance in organizing the
support.

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Pedagoginių psichologinių tarnybų organizavimo ir veiklos planavimo prioritetai tenkinant specialiųjų
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Introduction
While developing an appraisal scale to assess factors that play a role in the treatment of learning problems, we found different taxonomies classifying these factors. Most taxonomies distinguish external and internal factors. External factors can be: environmental influences, education, the teacher, the teaching methods, task difficulty etc. Internal factors can be: genetic aspects, traumatic experiences, neurological functioning, development of the motor system etc... (van der Leij, 1984, 109). These factors can also be situated very close to the learning task or not. For instance: reading problems can be caused by a very little interest of parents for books and newspapers (Hofmeester, 1988, 47-48), but also by an insufficient reading method used in the classroom. An insufficient method in the classroom can be considered as much closer to the “reading task” than the interest for books and newspapers at home.

Finally we developed the following questionnaire.

An exploring survey
It is very interesting to analyze how different persons involved in remedial teaching identify these factors. The main question is then: Is there a difference between the opinions of class teachers and those of remedial teachers, or psychosocial workers, or even parents? So we did a very small exploring survey. Following persons – all volunteers – have filled in the questionnaire: 92 class teachers of different primary schools in Flanders; 33 remedial teachers of different primary schools; 17 psychosocial workers who are responsible for the support of children with special needs in different primary schools; and finally 56 parents.
To compare the results, we just looked at the factors that are very “close” to the learning task. We also looked at the factors that are more “remote”, particularly the so-called “basic functions”. Examples of these are the (psycho-) motor system, visual perception, auditory perception, and brain functioning. For each group of persons we calculated the average score for the factors very close to the “learning task”:

class teachers: 4.5
remedial teachers: 3.6
psychosocial workers: 2.1
parents: 3.8

It is true these first results are not significant - it’s only an exploring survey. But it is worth analyzing them awaiting further research. For instance there is a great difference between the results of class teachers and those of psychosocial workers. Class teachers identify factors very close to the learning task. We suppose they also adapt their remedial teaching to these factors. For instance they can choose another reading method. Psychosocial workers – on the other hand - identify especially factors in family background, socio-economic situation… factors that are more remote. Then, for instance, at their advice parents must read more books together with the child and thus facilitate learning. We also calculated the average score for the “basic functions”:

class teachers: 2.2
remedial teachers: 3.2
psychosocial workers: 3.1
parents: 3

Also here the results are not significant, but it’s still very interesting to analyze the findings. For instance, remedial teachers, psychosocial workers and parents more identify “basic functions” than class teachers do. An explanation can be that remedial teachers, psychosocial workers and parents consider learning problems more from a medical point of view. In medical models basic functions (motor system, visual perception, auditory system) play a very important role.

Example of therapy focusing on motor system
For instance, in helping children with reading problems some therapists train the motor system in a way suggested by the Dutch neurologist Dr. Pierre Mesker. In the development of the motor system Mesker distinguishes four stages (Mesker, 1980):
- The “trunk” motor system during the first years. It means that the child can make the same movements with the arms and legs but alternately. For instance: walking, running, going up- and downstairs… are alternated movements.
- Then, from 4 till 6/7 years old a child has to develop the “symmetric” motor system. It means that the child can make the same movements simultaneously. The child develops that motor system in a very natural way. For instance: when a child wants to give you something with one hand, also the other hand opens to give you something else – even if there’s nothing in it.
- From 6 to 7 years on, the more “asymmetric” motor system starts to develop. For instance: eating with fork and knife, playing billiards. The child has to learn to co-ordinate these asymmetric movements.
- At the end the child must develop a dominant hand, leg. Normally, dominance begins during the development of the asymmetric motor system. If total dominance is not achieved at the age of 7 to 8 years, the risk of reading problems might increase.

Identification prescribes treatment
It is very interesting to analyze how people identify factors playing a role in the treatment of children with learning problems. Because, that kind of identification has practical implications. It prescribes the way of helping a child. A class teacher for instance will drill letters and groups of letters when the pupil has reading problems because drill and repetition are very important (= external factor but very close to the learning task). The psychosocial worker may conclude that it is better to support the parents in their interest for books (= external factor, but not as close). And the remedial teacher can conclude that’s better to train the motor system, for instance with the help of the “Mesker-blackboard” (= internal factor: basic function).
All this practical implications often have also financial consequences. Especially “basic functions therapies” cost a lot of money. For instance, the so-called “van Gemert therapy” costs $1500 which is
Focus on motor system Also the crawling-creeping-walking therapy from Dr. Carl Delacato (Pennsylvania, USA) is still popular. Delacato suggests for instance to repeat the early steps in the development of the motor system – namely: crawling, creeping and walking – in order to help children with reading and other learning problems. According to Delacato these stages are even directly related to the amphibian, reptilian, and mammalian evolutionary human ancestors (Delacato, 1963).

Focus on visual perception Marianne Frostig is well known for her Developmental Test of Visual Perception (DTVP) (Frostig, 1972). That test designs to assess visual perceptual skills in children (for instance: figure ground perception). Thus, it provides information concerning visual perception problems in need of training. Because, according to Frostig, there is a strong link between these difficulties and reading problems! So, a visual perception training program could solve these problems!

Sometimes we still notice children in classrooms with a pair of glasses, of which one glass is frosted. One day one eye is covered, the other day the other… These frosted glass method is meant to train the reflexes of the one-eyed fixation in order to improve the visual perception. Nowadays especially the “van Gemert therapy” promotes this kind of therapy, but in combination with reading exercises (van Gemert, 2007).

Also prismatic glasses are still prescribed. Normally they are used by persons with Meunière’s syndrome. But also children with slight balance disturbances can be helped with these prismatic glasses, because the balance disturbances can disorganize the eye movements and then cause reading problems (Kuipers & Weggelaar, 1986, 156).

Still very popular in Flanders are the “Irlen-filters”. Irlen did some research with coloured overlays putting them on a text when reading. These coloured overlays reduce the sensitivity of the eyes for light so the person can better read a text. The colour of the overlay varies from person to person. A kind of “colour indicator device” can help to find one of the 6700 variants of colour, colour depth and brightness. Sometimes also coloured pairs of glasses are used instead of the overlays (Irlen, 1991).

In “therapists land” also optometrists are settled. We just here focus on one visual-technical aspect of the optometry, namely the ocular motor system. It seems very logical that there is a strong link between reading and eye movements. For instance, eye fixations normally take about the same time: 200 – 500 ms. Saccades (eye jumps) have about the same range: normally between 5 and 10 characters. Children with reading problems on the other hand, show more abnormal and irregular fixations and saccades. They also show more regressions (they often repeat a sentence) and have more problems with the return sweep, when they have to move the eye from the end of a line to the beginning of the next line in a text (Just & Carpenter, 1987). Optometrists try to correct these wrong eye movements.

Finally, optology is a very strange approach. Optologists consider reading problems as problems with someone’s view on life! Children with reading problems must be helped with getting a better eye on their own life. So optology is more a kind of psychoanalysis (Van der Leij, 1984, 103).

Focus on auditory system Some therapists argue that reading problems are caused by disturbances in the auditory system. Especially the “mother voice therapy” of the French doctor Alfred Tomatis is well known (Tomatis, 1978). According to Tomatis the auditory system is disturbed from the beginning. It can be caused by a prenatal trauma, or by a trauma during the first years: the loss of the mother as a safe refuge, the confrontation with the rival father, the confrontation with a new brother or sister now also demanding the attention from the mother… So Tomatis suggests to repeat the acoustic history of the child. The therapy starts with the evocation of the voice of the mother before birth by means of electronic signals. After a while, the right ear must be stimulated. According to this approach, children with reading problems listen with the wrong ear: namely the left one. So what the child hears, is transmitted to the right hemisphere… But the language functions are situated in the left hemisphere…

In Flanders Spirig, a doctor, still defends the approach of Tomatis, but also appeals to speech therapists for auditory training, to ergonic therapists for motor training using the Mesker blackboard, to optometrists etc (Spirig, s.d.).

Focus on neurological system We already explained that the dominant hemisphere for language is the left one. But the Dutch neuropsychologist Bakker argues that a right hemisphere visual processing of words is necessary as well (Bakker, 1990). Neurological research with “Split Brain patients” reveals the
different functions of the two hemispheres. In the 1960s, there was no other cure for people who suffered from a special kind of epilepsy than by cutting off the connection, corpus callosum, between the two hemispheres. Observations of these “Split Brain patients” demonstrated then that the left and right hemispheres are specialized in different tasks. The left side of the brain is specialized in taking care of the verbal tasks and speaks much better than the right side, while the right half takes care of the space perception tasks. So, when reading you need the two hemispheres: the “verbal” left hemisphere and the “perceptual” right hemisphere. Because, when reading you need to see the words (right side) and also to pronounce them (left side).

According to Bakker the two hemispheres of a good reader must be in balance. If the right one is too dominant, the reader becomes a “spelling” reader (reads letter-by-letter). If the left hemisphere is too dominant, he becomes a “guessing” reader. To repair the balance, the spelling reader must train the left hemisphere, the guessing reader the right hemisphere. Therefore Bakker developed two kinds of therapies: hemisphere-specific stimulation (HSS) and hemisphere alluding stimulation (HAS). “Specific” means that the therapy tries to stimulate the hemisphere in a direct way. For instance, spelling readers have to read words in the right field of the screen of a computer. Then these words will be transmitted to the left hemisphere. You can also present the same words by means of earphones but just for the right ear. Or the child must feel the words – for instance made by sandpaper – with its right hand in a kind of covered “touch box”. To help the guessing reader the therapist just does the opposite: he shows the words in the left field of a computer screen, he lets hear the words to the left ear of the reader, or lets touch the reader with the left hand.

Hemisphere alluding stimulation (HAS) means that the therapist tries to stimulate the hemispheres in a more indirect way. For instance, using texts printed in “perceptually demanding fonts” is an example of a HAS-technique. The fonts oblige the guessing reader to utilize more the right perceptual hemisphere, for instance: “Basic functions therapy have not died!”

Focus on medicines The past decades therapists also try to influence the neurological system by means of taking medicines. Some believe in the treatment of learning problems with stimulants as Ritalin, Concerta etc., or even with tranquilizers and antihistamines. Other therapists prescribe diet plans with specific lists of vitamins, fish oils and omega 3’s. Finally, Nootropil (or piracetam) is considered as the most promising medicine for children with learning problems. Research suggests that for instance dyslexics treated with piracetam have shown improvements in reading skills, verbal memory and verbal conceptualizing ability, feature analysis, and processing of letter-like stimuli (Minjon, 2000).

Scientific research Basic functions therapies are still popular. The exploring survey we did, reveals that especially psychosocial workers, remedial teachers and parents believe that these therapies can help children with learning problems. Parents even are prepared to spend a lot of money to help their children. But class teachers show doubts on the effects of these therapies. They believe more in training aspects that are more close to the learning task. The main question now is: Is their doubt about basic functions therapies justified? For instance, is there research evidence?

Effects of (psycho-)motor therapies First some conclusions about the effects of (psycho-)motor therapies. It was already debated in the scientific literature up until the early 1970’s, when finally the medical community arrived at the consensus that (psycho-)motor training should be discarded as a false concept with no therapeutic role (Novella, 1996). The French psychologist Alfred Binet already found no correlations between learning problems and motor system aspects (Netelenbos & Truijens, 2002, 410). But also The Berkeley Growth Study, a long term developmental investigation since 1928, did not reveal any correlation between motor system problems in the early years and success at school later on (Bailey, 1955). Research of Jordan found out no relationship between having a physical handicap and having learning problems (Netelenbos & Truijens, 2002, 411). De Moor and van Waesbergh also checked that there’s no relationship with so-called softenon patients (de Moor & van Waesbergh, 1982). Sofoten, a medicine that was taken during early pregnancy (in the early 1960’s), caused serious congenital anomalies in the fetus, notably amelia and phocomelia. However, in spite of these amelia, softenon patients had no learning problems afterwards. Finally, children with learning problems who got special motor training, did not make any progress in learning afterwards. That was the conclusion of Rispens (1977, 98-109) and Herman (Netelenbos & Truijens, 2002, 411).

Intervening role of (psycho-)motor training Nevertheless, these conclusions of scientific research don’t alter the fact that some poor readers can be helped with (psycho-)motor therapy that focuses on body
fitness, concentration, impulse control, frustration tolerance, social skills and self confidence. Training this “intervening” skills and conditions can result in better learning. Finally, (psycho-)motor therapy is significant because it makes life better. So, anyway it’s worthwhile! But there’s no direct significant effect on learning. Children with only learning problems (and no motor problems) will have no profit by (psycho-)motor training. Once we heard the following witticism: A child with dyslexia having (psycho-)motor training, will become a more supple, flexible child with dyslexia. Besides, children with only (psycho-)motor problems, are entitled to have (psycho-)motor training. These days it’s often forgotten.

**Other basic functions therapies: also little support** Also with other therapies focusing on basic functions as visual conception, the auditory system, the neurological system… there is little support for improved learning performance (Evans, 1999; Billiaert, 1996, 15-17; Wentink & Verhoeven, 2001, 23-25). No research evidence is available currently to confirm that visual perception training programs, prismatic, coloured or other kinds of pairs of glasses, mother voice therapies etc. improve overall reading achievement. Even “the balance approach” from the Dutch neuropsychologist Dirk Bakker can not unlock the specific reading problems. For instance, personal research has revealed that spelling (according to Bakker this reader utilizes too much the right hemisphere) and guessing (this reader utilizes too much the left hemisphere) are not two different problems. In fact, these are solutions from the poor reader himself for a same problem, namely a weak automaticity of the letter sound (grapheme – phoneme) correspondence (Seys, Van Biervliet & Van Biervliet, 1995, 8). Secondly, poor readers are not just spelling or guessing readers. Most of the poor readers spell and guess at the same time. Even, in the morning they spell, and in the evening they guess. Thirdly, Bakker himself admitted that other researches have applied the HSS and HAS techniques but in the opposite way (for instance spelling readers had to read words in the left – and not in the right – field of the screen), and that there was no significant difference! (Bakker at a conference on Feb 24, 1994 in Revalidatiecentrum Spermalie in Bruges, Belgium; cf. also Billiaert, 1989-…, VII, disc. 1, 2).

**Medicines: prudence!** On the question of medicines, they must be prescribed with care. Ritalin is not to be used in the first place to facilitate learning, but for the treatment of ADHD. The same with tranquilizers. They can be useful to help children with emotional problems without implicating their effect on learning. Only nootropil (or piracetam, produced by the Belgian company UCB Pharma) can be considered as a real “smart drug” (Minion, 2000). But also here prudence is still needed because its exact mechanism of action is not fully understood (Nootropil. How does it work?, 2007).

**Conclusion** Basic functions are too “remote” from the proper learning task. It’s better to focus therapies on aspects more “close” to the learning task. Most of the Flemish class teachers don’t read scientific literature. But when asking what kind of therapy they prefer, the answer is clear: no basic functions therapies but remedial teaching focusing directly on the learning task. However, as we noticed - thanks to the results of the questionnaire – the use of basic functions therapies has not died. Especially remedial teachers, psychosocial workers, and parents still believe that these therapies can help. And that is not a promising evolution, because remedial teachers and psychosocial workers gain more and more influence in the Flemish schools… The parents, they just pay for helping their child… And the class teachers just watch and listen to the experts… because it all sounds so “professional”! Yet, can all that really help the child?

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URBAN EDUCATION
Multicultural education has become a common element in many educational systems as well as in many curricula for preparing new teachers. Since it first emerged, multicultural education has come under attack on many fronts. There are several common criticisms leveled against multicultural education which will briefly: in the remainder of this paper, we will offer a response to each of those criticisms.

Multicultural education is ineffective
The general argument here is that multicultural education, as it is currently practiced, has been ineffective in that there has not been a significant shift in people’s attitudes toward members of different cultural groups. According to Jeevanantham (2001), there are several reasons for this. First of all is the problem of culture, which according to this author, is relegated by multicultural education to being a static, unchanging, and easily categorized object, when in reality culture is dynamic, constantly changing, and difficult to categorize. Also, multicultural education does not readily distinguish between culture and race, but instead merges both and treats them as a single phenomenon, thus ignoring the subtle differences between ethnocentrism and racism. Other reasons for the ineffectiveness of multicultural education, according to Jeevanantham (2001) are that there is no clear method outlined for the instruction and the fact that such teaching is context bound. When the context changes what lasting learning is the student left with? Finally, Jeevanantham asks, how can subjective structures produce objective truths? In other words, if our goal is to know other cultures, and since culture is highly subjective, how can we know that we have achieved our goal?

Heroes and holidays
The argument of this criticism is that the way multicultural education normally occurs is superficial and, as a result, inaccurate. The characterization of how this occurs is that teachers simply mention the “big names” (the heroes) from a culture and discuss their accomplishments and describe certain characteristics or events associated with that culture (the holidays) This approach, it is argued, provides only a brief over-generalized view of a culture and leads to strengthening stereotypes. The effect is that this approach can create an identity crisis for some students (Helfenbein, 2003.) It is not just that this is the way multicultural education occurs, but that, given limited time, resources, knowledge, etc. it is the only practical way that it can occur. Another consequence of this approach is that it can perpetuate existing stereotypes and, although the approach attempts to celebrate race, it does little to address class inequality (Arber, 2006).

Undermines national identity
Perhaps the most common criticism of multicultural education is that a nation’s identity, particularly the American identity, is bound up in certain cultural elements and that multicultural education, with its celebration of diversity serves only to weaken our national identity. This criticism further argues that multicultural education destabilizes the nation’s naturalization process and is at odds with the feelings and instincts both of those in the racial/ethnic majority as well as the minorities that these policies are allegedly designed to help (Fonte, 1996).

Responses to the Criticisms
Multicultural education can be effective
The criticism is that multicultural education has been ineffective. The evidence suggests otherwise. Several studies highlight the success of multicultural education. For example, Philips (1972) found that American Indian students participated more actively in class discussions when teachers used group-oriented participation structures that were consistent with their community cultures. Kathryn Au and her colleagues (Au, Tharp, Crowell, Jordan, & Calkins 1985), working in the Kamehameha Early Education Program in Honolulu, Hawaii, found that both student participation and standardized achievement test scores increases when they incorporated teaching strategies consistent with the cultures of Native Hawaiian students and used the children’s experiences in reading instruction.

Perhaps the perceived ineffectiveness of multicultural education is due to the way it is sometimes implemented. For multicultural education to be implemented successfully, it should not be viewed merely as a curriculum reform. Instead, it entails more systematic reform. Institutional changes must be made in
the curriculum; the teaching materials; teaching and learning styles; the attitudes; perceptions, and behaviors of teachers and administrators; and the goals, norms, and culture of the school (Banks, 2004). A growing body of research on multicultural education suggests that only by reforming the entire school environment can substantive changes in attitude, behaviors, and achievement take place (Nieto, 1999). Most schools have not undertaken such a comprehensive approach. When they do, they find that they need to modify the school culture itself. As a result, they may include in their plans such strategies as conflict resolution, cooperative learning, multicultural curriculum development, parent and community involvement, and the elimination of tracking. Such a comprehensive approach is necessary for multicultural education efforts to be fully successful, but such an approach is also fraught with difficulty because it challenges traditions and conventions that are that the very heart of schooling in the United States (Nieto, 2004).

**Multicultural education can be substantive, and not just “heroes and holidays”**

The criticism is that multicultural education is necessarily superficial. An examination of several successful multicultural education curricula indicates an impressive depth of substance that contradicts that criticism. Research indicates that the use of multicultural textbooks and other teaching materials, and cooperative teaching strategies that enable students from different racial and ethnic groups to interact positively in equal-status situations helps students develop democratic racial attitudes (Banks, 2006). These kinds of materials and teaching strategies can also result in students choosing more friends from outside racial, ethnic, and cultural groups (Banks, 2006), suggesting that the outcomes are much more substantive than mere knowledge of “heroes and holidays.”

A second aspect of this criticism is that multicultural education will create an identity crisis for some students. However, Nieto (2004) argues that affirming and sustaining students’ cultural identity facilitates, rather than hinders their academic success. She found in her case study that students of diverse backgrounds respond in numerous ways to the pressures of an assimilation society that is attempting to do away with differences. These young people are involved in the difficult job of creating new alternatives for achieving success in school. By refusing to accept either assimilation or rejection, they force us to look at new ways of defining success. They challenge the road to success that schools and society have traditionally defined, in the process creating new models. The characteristics of this model are people who value their culture, or at least parts of it; who are often bilingual, even demanding to use their language in school whether or not they are in a bilingual program; and who are involved with peers from a variety of backgrounds, with what would be considered typical American teenage activities, tastes, and behaviors. As a result of this new approach, they are involved in the process of transforming some of the values of our society.

In Donna Deyhle’s research with Navajo youth (Deyhle, 1995), she found that those students who were able to maintain Navajo and reservation connections gained a firm footing in their world. In comparing a reservation and non-reservation school, she also discovered that reservation schools were more successful in retaining and graduating students. Deyhle concluded that Navajo youth who have a strong traditional culture, or what she termed “cultural integrity”, are also the most academically successful students.” This conclusion, that sustaining native language and culture nurtures academic achievement, contradicts not only conventional education philosophy but also the policies and practices of schools that have often done everything possible to eradicate students’ identities.

Rather than attempting to erase culture and language, schools should do everything in their power to use, affirm, and sustain them as a foundation for students’ academic success. School policies and practices that stress cultural knowledge, build on students’ native language ability, and emphasize the history and experiences of the students’ communities would be the result (Nieto, 2004). Among the consequences of multicultural education, according to the critics, is that it helps to maintain stereotypes. For example, Albert Shanker (1991), the late president of the American Federation of Teachers, argued that while multiculturalism may be, on the surface, an appealing idea, it is likely to degenerate into stereotyping about minority views when applied in the classroom. However, evidence suggests that just the opposite is the case. In a study that investigated the effect of shadowing culturally different students on pre-service teachers’ disposition toward diversity showed that authentic field-based cross-cultural experiences can powerfully affect pre-service teachers' ability to modify their racial and stereotypical dispositions toward diversity and diverse students (Ukpokodu, 2004). Yet, there is an element of truth to this criticism. Too often, traditional multicultural education courses provide generalizations about cultural groups that tend to reinforce the stereotypes, misconceptions, and biases that pre-service teachers already hold about diverse students (Banks, 2000). What is needed are multicultural education courses that provide students with opportunities, in intimate authentic contexts, to experience people who are culturally different from
themselves in order to help them gain a realistic and humanistic understanding of the cultural and social contexts that shape their experiences.

**Multicultural education can be unifying, not divisive**

The critics claim that multicultural education serves only to weaken our national identity. This view was summarized neatly by Schlesinger, who wrote:

What happens when people of different ethnic origins, speaking different languages and professing different religions, settle in the same geographical locality and live under the same political sovereignty/ unless a common purpose binds them together, tribal hostilities will drive them apart. Ethnic and racial conflict, it seems evident, will now replace the conflict of ideologies as the explosive issues of our times.” (Schlesinger, 1992, p. 10)

The “Afrocentricity and the ethnicity cult”, the “institutionalized bilingualism”, and the “meanness generated when one group is set against another” are all sources of the fragmentation of America that threaten the dream of “one people” (Schlesinger, 1992, p. 110). It is a common adherence to ideals of democracy and human rights, Schlesinger contends, that has held American people together in the absence of a common ethnic origin. The claim, that multicultural education will divide the nation, assumes that the nation is now united. However, the American nation is already deeply divided along racial, ethnic, and social class lines. Multicultural education, at its core, is an attempt to help unify a deeply divided nation, not to divide one that is currently united.

Multicultural theorists assume that we cannot unite the nation around its democratic ideals by forcing people from different racial, ethnic and cultural groups to leave their cultures and languages at the schoolhouse door. An important principle of a democratic society is that citizens will voluntarily participate in society and strive for the common good and that their participation will enrich the nation-state. When citizens participate in society and bring their cultural strengths to the national civic culture, both they and the nation are enriched. Renato Rosaldo, the Stanford anthropologist, calls this kind of civic participation cultural citizenship (cited in Banks, 2006, p. 97). Assimilationist notions of citizenship are ineffective today because of the deepening diversity throughout the world and the quest by marginalized groups for cultural recognition and rights. Multicultural citizenship is essential for today’s global age (Kymlicka, 1995). It recognizes and legitimizes the right and need of citizens to maintain commitments and to the national civic culture. Effective multicultural education will help students develop the delicate balance of cultural, national, and global identifications and to the national civic culture. Multicultural education will help students develop the delicate balance of cultural, national, and global identifications (Banks, 2006). Another part of this criticism is that multicultural education destabilizes a nation’s naturalization process. Nationalists and assimilationists throughout the world worry that if they allow students to maintain identification with their cultural communities, they will not acquire sufficiently strong attachments to their new nations (Center of Multicultural Education, 2005). According to Kymlicka (1995) this reflects a “zero-sum conception of identity.”

The theoretical and empirical work of multicultural scholars indicates that identity is multiple, changing, overlapping, and contextual, rather than fixed and static – and that thoughtful and clarified cultural identifications will enable people to be better citizens of the nation (Banks, 2006). The final aspect of this criticism of multicultural education is that it is at odds with the feelings and instincts both of the majority population and of the minorities that these policies are allegedly designed to help. Grant offers three reasons why this is so. First, a dual structure has historically existed and continues to exist, which causes and facilitates different treatment of America’s white and nonwhite people. Second, Americans, for the most part, live in a plural society, which can be defined as racially/ethnically segregated communities within cities and states. The plural society does not actively facilitate communication and cooperation across racial and ethnic groups, and therefore it resists multiculturalism. Little attention is given to teaching non-white groups about other minorities, and very little instruction in multicultural education is about how to accept and affirm the culture and history of non-white groups and to celebrate their contribution to American society (Grant & Sleeter, 1996). Third, multiculturalism and race in society and multicultural education in school are marginalized as they are situated within a struggle between the democratic ideals of the country and the United States Constitution and the affirmation of these ideals.

Myrdal (1944), in *The American Dilemma*, offered an observation to help Americans to recognize the fault line between democratic ideal and practice and to deal with the problems and issues of race and racism. He argued that the problem of white Americans with black Americans can be analyzed and understood only if it is located in the norms and values that describe and define the basic ideals of America as a nation and as a people. To remedy this situation, we must begin the conversation by recognizing that we have failed to align our practices with our democratic ideals. Further; we must
acknowledge that we have a pluralistic society but that we have done little as a nation to foster intergroup integration and harmony.

The issue of national identity has taken a variety of forms in different societies. In some nations, citizenship has been linked to biological heritage, such as Germany and Japan (Lie, 2002; Luchtenberg, 2005). In such cases, it has been difficult for immigrants in these nations and, in some cases, their descendants to be perceived as full citizens by other residents. Ethnic revitalization movements, including the Civil Rights Movement in the U.S., strongly challenged assimilationist and biological conceptions of citizenship. As a result, freedom, and the right to differ, are now a well-established ideal, if not yet fully a reality, in many democratic nations. According to Nieto (2004), Americanization in the past has always implied Angloization. It meant not only learning English but also forgetting one’s native language; not only learning the culture but also learning to eat, dress, talk, and even behave like the European American model. To go through that process meant the inevitable loss of a great part of oneself in the bargain.

The designation of “American” has traditionally been characterized as white and English speaking. Others, even if they have been in America for many generations, have still been viewed as separate. Our present and future diversity demands an expanded and inclusive definition, not hyphenated Americans, implying split and confused identities, but rather a new characterization that emphasizes not confusion or denial, but the transformation of what it means to be an American (Nieto, 2004).

Balancing unity and diversity is a continuing challenge for multicultural nations. Unity may be achieved at the expense of diversity. Unity without diversity results in hegemony and oppression; diversity without unity leads to Balkanization and the fracturing of the nation. A major problem facing nations throughout the world is how to recognize and legitimize difference and yet construct an overarching national identity that incorporates the voices, experiences and hope of the diverse groups that compose it. Many ethnic, language, and religious groups have weak identifications with their nations because of their marginalized status and because they do not see their hopes, dreams, visions, and possibilities reflected in the nation-state or in the schools, colleges, and universities (Ladson-Billings, 2004). Finding the balance between unity and diversity may very well be the ultimate challenge of multicultural education. As Gandhi said, “The ability to reach unity in diversity will be the beauty and the test of our civilization” (cited in Ajegbo, 2007, p. 5).

References


God or no God?
George Foldesy and David Holman

Introduction
The First Amendment reads in part that “Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof.” These sections of the First Amendment known as the Establishment Clause and the Free Exercise Clause, are applied to the individual States through Section 1 of the Fourteenth Amendment which reads as follows: “No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States.” When these amendments are considered in tandem, the interpretation is that the government will neither interfere with an individual’s right to practice religion nor subject a person to unwanted religious overtures. In creating this balance, the question becomes: how much religion, if any, can be brought into the school setting without offending those who prefer to be free of some or all faith based influences?

Although case and statutory law provide guidelines to the schools, the resolution of this conflict which is fueled by divergence in religious ideology continues to be difficult. It is the purpose of this paper to describe a sampling of the clashes that have transpired, identify the judicial decisions and federal mandates that influence decision-making, and finally provide thoughts that may clarify the roots of the clash.

A sampling of religiously inspired conflicts
Several events in the schools have continued to fuel the controversy. One such example took place in a Missouri school district that began mandatory assemblies with a prayer. These Christian prayer sessions included instruction on religious etiquette, such as bowing heads and praying. The events were videotaped by parents and given to the American Civil Liberties Union (ACLU) who subsequently brought legal action against the school district. The Judge ordered the school district to “abide by its policy recognizing separation of church and state and forbidding the espousal of religious faith.”

It was reported in the March 14 Education Week that the ACLU was suing the Newark, New Jersey School District over its decision to hold graduation exercises in a Baptist church which allegedly violated a Muslim student’s religious beliefs forbidding him to enter a building with sacred images. Specially, the lawsuit contends that the district showed preference of one religion over others, essentially forced people to attend a place of worship and discriminated against students based on their religious beliefs. Action is still pending.

A number of recent events occurred which involved conflicts with the school’s dress code. A Texas School District drafted a policy which regulated hair and dress. The portion of the policy which addressed facial hair was questioned by Muslim students who requested an exemption based on religious beliefs. Initially, the principal granted permission to wear beards then later rescinded this decision questioning his own judgment as to whether or not the student’s motives were in fact religiously motivated. In an attempt to accommodate each student’s religious beliefs, the principal initiated a policy requiring parents to accompany their child to make a case for the waiver of the existing dress code. Although this protocol has resolved many issues to date, the principal questions, “for how long will the protocol go uncontested?”

Another situation implicated a Houston female student of Islamic faith who was forced to wear the school uniform over her abaya. This student was told that there could be no exception to the school dress code. The rationale used by the school was the dress code allowed a means to monitor those students who entered the building but were not enrolled. No legal action has been filed to date. A similar set of circumstances occurred in an Oklahoma School. Here, a female Muslim student was suspended for wearing her hijab to school. After initiating legal action against the district, the court reinstated the student accompanied by a stern reprimand to the school calling attention to their responsibility to respect an individual’s First Amendment Rights.

Case law related to funding
The issue of public funds to support various aspects of religious schools has a long history of litigation. In 1930, the Court decided in Cochran v. Louisiana State Board of Education that a state plan to provide textbooks to parochial school students was constitutional. The importance of this case was the emergence of the child benefit theory which in essence shifted judicial thinking to helping the child regardless of religious affiliation. Later in 1947, Everson v. Board of Education allowed the use of public monies to
fund transportation for parochial students. The caveat being that although permissible under the First Amendment, stricter state constitutions may prohibit the busing of students affiliated with parochial schools. Here again, the child benefit theory was at play. The Cochran and Everson rulings provide the groundwork for Board of Education of Central School District v. Allen. Again, the Court upheld the distribution of textbooks to parochial schools since there was no evidence that the books would be used to facilitate the teaching of sectarian values.

The question to be answered is “how much support can be provided to the parochial schools without offending the Constitution?” Lemon v. Kurtzman shed light on this issue by ruling that state aid for the purpose of salary supplements for church related schools in Rhode Island and fiscal support for salary, textbooks and instructional materials in Pennsylvania were constitutionally prohibited.

A three part analysis called the Lemon Test emerged from this case for the purpose of determining whether or not a state statute is constitutional under the First Amendment. The three prongs are:

1. the statute must have a secular legislative purpose;
2. its primary effect neither advances nor inhibits religion;
3. it must not foster excessive government entanglement with religion.

The Lemon test served as a useful standard throughout the 1970s, but diminished in importance as time progressed. The Court later referred to the Lemon Test as a “guideline” then as “no more than a useful guideline.” Finally Justice Scalia, a supporter of parochial schools, attacked the Lemon test and virtually relegated this standard useless. The next landmark case that focused on the financial aspects of education was Mueller v. Allen. This case validated a Minnesota statute which allowed all taxpayers to deduct a specified amount from their state income taxes regardless of whether their children attended a public or private school. Later in the 1997 case of Agostini v. Fulton, Justice O’Connor announced “a significant change in Establishment Case Law.” Here, the Court held that salary payments to Title I parochial teachers did not violate the Establishment Clause of the First Amendment. Continuing this line of thought, the Court opined in Mitchell v. Helms that federal funds provided to sectarian schools for purchasing instructional materials did not violate the Establishment Clause. Even providing an interpreter to a Catholic High School deaf student did not offend the constitution (Zobrest v. Catalina Foothills School District). The decision held that religious groups can also benefit from receiving general government benefits.

In recent years, the use of vouchers has gained popularity. A voucher is a coupon with a specified dollar amount that a parent can use to fund the education of their child in a private or parochial school. Although many opponents claim that vouchers are no more than a scheme to support religious education, the Court in Zelman v. Simmons-Harris disagreed. In this case the Court ruled that the Ohio voucher program was constitutional.

Cases related to expression of religion

Expressing one’s religious beliefs takes on many forms. Released time is one such practice that provides an opportunity for students to immerse themselves in religious education. The Court in Illinois ex rel. McCollum v. Board of Education of School District No. 71 held that released time for religious instruction hosted by the public schools was unconstitutional. However, in a later ruling, the Court noted that released time was permissible if students attended classes off campus. (Zorach v. Clauson). Bible reading, prayer and other related activities have been a long standing controversy within the public school context. The companion cases of School District of Abington Township v. Schempp and Murray v. Curlett dealt with state mandated prayer to be read each school day. The Court held that these religious activities were unconstitutional. Many school districts realizing that authorized prayer, even though voluntary, was legally unacceptable moved to a practice of silent meditation. In 1985, the Court in Wallace v. Jaffree opined that the state statute authorizing a period of meditation was in violation of the Establishment Clause. Another common practice sanctioned by schools was to include prayer in the graduation ceremony. The fact situation in Lee v. Weisman indicated that the Providence, Rhode Island School district invited members of the clergy to offer the invocation and benediction prayers as part of the graduation ceremony. The Court struck down this practice even though it was nonsectarian.

Sante Fe Independent School District v. Doe is an example where a school district alleged that the prayer was student initiated. Specifically, the student council chaplain offered the prayer prior to each football game during the season. Although the district drafted several policies, each one called for a student election to determine if prayers should be offered and which student should deliver them. The Court struck down the student-initiated prayer on the grounds it violated the Establishment Clause. In summary,
the rationale used to decide this case indicated that the invocation was delivered on school property, broadcast over school equipment, delivered prior to a school-sponsored event and used the school’s name, logo, insignia and colors as a backdrop for the activity.

Litigation has also resulted when a district has denied access to a building because the activity was religious in nature. The underpinnings of Board of Education of Westside Community Schools v. Mergens focused on the Equal Access Act which prohibits discrimination against students who wish to conduct a meeting…on the basis of the religious, political, philosophical …speech at such meetings. In this case a group of students who desired to meet on school grounds for religious reasons were denied access. The Court in finding for the students noted that students have the right to organize their own groups in the schools whether these groups are religious, political or philosophical. Another case in which students were denied access to the school facilities was Good News Club v. Milford Central School. The Court concluded that preventing the club from meeting, even though the agenda was religious, abused free speech protected under the First Amendment and that the school’s concern of violating the Establishment Clause was not an issue and did not justify the restriction.

Discussion
When issues related to religion surface in the context of education, there appears to be a tug between those who prefer to incorporate religion into the public schools and those who are of the opinion that religion has no place in this arena. Much of the argument stems from the interpretation of the Establishment Clause of the First Amendment. Theoretically, the avoidance of conflict is best achieved by governmental entities pursuing and maintaining a stance of neutrality. To do so means that public schools neither support nor inhibit religious practice. However, neutrality can be defined several ways. One definition stresses that no religion should be supported. A second position focuses only on the avoidance of establishing and supporting one national religion. Given this ambiguity, it is difficult to maintain a stance of neutrality. The case law seems to indicate that states may be justified in financing a viable alternative to the public schools as long as the funding does not contribute to the sectarian purpose of education. Loaning of textbooks, equipment, providing instruction has an important secular function, that of educating the child, which fuels the justification for public financing.

However, does any aid or support to parochial schools advance religion? Can a parochial school continue to exist if texts, transportation or other services were not provided? If not, then does this advance religion? Could funds that would normally be used to support these purposes now be diverted to enhance religious indoctrination? Even though all of these questions are looming, what seems to be evolving is the notion that if public funds are used to support a variety of parochial schools and not to impose a state religion, this practice may be within the comfort of the Establishment Clause.

Behaviours which are overtly religious and appear to be sanctioned by the public school during school time in opposition to those who prefer not to be subjected to religious overtures is unconstitutional. Individual religious practice impacting only those who desire involvement is respected and constitutionally protected. The question still remains: how much, if any, religious activity should be supported?

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The why’s and how’s of teaching about religion
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Introduction
The goal of this article is to provide a brief outline of why and how to teach about religion in public education. I hope the article will be most useful for teachers and administrators planning introductory courses on the secondary school level or perhaps foundational courses in colleges that do not have a developed religious studies department but realize that some basic introduction to the study of religion should be available to their students.

First, I outline a few of what I believe are the primary justifications to study religion critically and teach the results of this study to students in our schools. Second, I offer observations on how to teach this vast and intriguing subject. Finally, I reflect and give suggestions for avoiding several disastrous situations and practices I have had the misfortune of witnessing in the twenty years I have been teaching about religion on the college level in the United States.

Why teach about religion?

Students know very little about religion
Students show a profound lack of knowledge about religion in my introductory courses on the college level. This situation has changed little in the years I have been teaching in this discipline. One might expect that given the increasing emphasis of conservative religious denominations on the literal truth and interpretation of Biblical texts, that basic familiarity with these texts would be on the rise. Unhappily, this is not the case.

I teach in a part of the USA that is almost exclusively Christian (sometimes called the Bible Belt). One might suppose that at least a significant sample of students in my introductory classes would know the basics of the Christian narrative. Yet, even on tests coming after the assignment to read the Gospel of Matthew, most students cannot identify the content of Jesus’ Sermon on the Mount; few can relate any of Jesus’ parables. If I am especially fortunate, a few can identify one or two miracles in the story (most know about the concept of the immaculate conception in some form or other), rarely do any know the details of the crucifixion, and, most surprisingly, more than half are not able to identify Judas as the disciple who betrays Jesus. Just as disturbing is the extent of misinformation about religion students bring to class. Of course it is often impossible to distinguish misinformation from bland ignorance. But occasionally a courageous student will ask why Catholics are not Christians, why Jews worship the pig and Hindus the cow, or why Muslims recognize so many gods and goddesses. One would think these ideas are relatively easy to dispel, until one sees the results of the first major exams where one discovers that Moses found the Ten Commandments on Mt. Rainier or that Jesus was betrayed by his disciple, Ringo Star. (Occasionally lists of these responses circulate on the Internet. They are only amusing until similar responses crop up in one’s own class.)

So that students can understand religion as a powerful and pervasive influence
Religious ideologies are a deep and persistent force driving international relationships in many parts of the globe. The conflicts in the Middle East between Israel and the Arab countries surrounding it, the civil unrest in Iran, Turkey, Egypt, Jordan, Syria, and Algeria, and the civil war currently threatening in Iraq, the tribal and religious genocide in the Sudan, the embers of ethnic cleansing still smoldering in Serbo-Croatia, the potential for nuclear confrontation between India and Pakistan, not to mention the constant threat of religiously based terrorism are all related to the religious animosities that have been part of world history for centuries. No student will be well educated about the causes and motivations for these persistent and ongoing conflicts unless they understand the religious perspectives and outlooks of these cultures.

So that students can understand political and civic issues
Another fundamental justification for a strong program of religious studies is the massive role religion plays in domestic affairs. I can speak knowledgably here only of the United States, but I am certain this is true of every country represented in our conference. Domestic issues have become increasingly intertwined with religious considerations. Judgments about political leadership are commonly based now on the politician’s confessional stance. Political candidates face a series of religiously based litmus tests from conservatives and liberals on such issues as abortion, stem cell research, homosexual rights (especially marriage and spousal benefits), women’s rights, birth control, adoption, even zoning and gun
control. No student wanting to understand the affairs of state can possibly be successful if they do not understand the religious influence on the electorate.

**So that we can enhance cultural life**

One of the goals of public education is to offer the student the benefits of entry into a cultured existence. An essential aspect of the quality of our life is the enjoyment of art, music, literature, cinema, architecture and the full range of creative expression our society can offer. To be educated is nearly synonymous with being cultured. Religion plays a fundamental role in our cultural life and knowledge of religion is a central aspect of this goal. The ability to recognize religious symbols, stories, rituals, and teachings in artistic expression is crucial to grasping the message and the meaning of the arts. Emerging multicultural and 'cross-over' literature requires even broader knowledge of world traditions.

**So that we can work to end religious violence**

I cherish the hope and belief that through the study of religion we can find effective ways to deal with and hopefully end violent conflicts fueled and sustained by religious hatred. Unless we can become informed about and learn to understand each other’s religious views and rid ourselves of misinformation about our global neighbors, peaceful resolution of difference will be impossible.

**How to teach about religion**

**Critical approach to religion as opposed to faith based approach.**

The most basic and broad distinction in religious studies is one that exists between the critical and the faith-based approach. As the name implies, a faith-based approach is used by religious seminaries and sectarian schools always with the presumption of student or audience membership in the faith community and acceptance of the fundamental principles and dogma of the faith. The purpose is nearly always to train members of the faith community as leaders or informed adult. The nature of this approach protects certain basic beliefs and presuppositions of the faith from critical examination. Membership in the community implies commitment to these basic ideas and they are usually not offered as matters for serious questioning except as practice against external attack.

The critical approach is one used by all liberal studies curricula and forms the ideological basis of western scholarship. It is based on Descartes' notion of critical doubt and holds as a basic methodological principle that every proposition is open to the question -- How do you know this proposition is true? Until that question is answered satisfactorily, no one is compelled rationally to accept or believe the concept. Pedagogically the conflict engendered by these two approaches can easily become political debate where passionate devotion to cherished beliefs clashes with academic freedom. Often voicing a question about matters of faith is taken as an attempt to denigrate or even destroy a religious framework. Faith community objections to critical curricula is seen by instructors as attempts at illegal interference and control of public education by religious fanatics. Handling such conflicts is an important aspect to consider in developing a curricula and choosing what matters to discuss and what to leave for other educational programs.

**Exoteric v. esoteric approach to religion**

A second important distinction in religious studies involves what I call the 'exoteric' vs. the 'esoteric' approach to teaching. The choice here concerns whether the teacher should approach her subject matter from the perspective of one who stands inside the faith (the esoteric viewpoint) or from one who stands outside the faith (the exoteric). I mean by “inside” the viewpoint of a self identified participant, believer, or member of the faith community either by birth or by choice. The esoteric approach, in its purest form, then, would employ or seek out Christians to teach about Christianity, Jews to teach about Judaism, and Muslims to teach about Islam etc. The exoteric approach would have no such requirements, but rather insist only that the instructor be academically knowledgeable about the religious faith.

**Bible as literature**

The 'Bible as literature' views sacred scriptures as the product of human creativity, as works of art to be read and analyzed much in the same way students would read Shakespeare or Hemmingway. The approach, advocated explicitly by the US Supreme Court in the famous Abington v. Schempp case, claims the advantage of avoiding the controversial issues of metaphysical and theological Truth. At the same time, it recognizes the extraordinary literary and artistic merit of many of the Biblical stories, and it introduces the students to stylistic and historical influences of the symbols and narratives that form the basis of much of the art of western culture.
Comparative religion
Comparative religion was once the mainstay of the academic approach to the study of religion used in nearly all the major university departments in American during the early 20th century. At the name implies the goal of this method is to find points of comparison by which the student can evaluate the commonalities and differences of various religions. It has now fallen out of favor among scholars since the method often failed to give any voice to religious thinkers from non western traditions, most of whom were barred from academic jobs or publications. Still, its echoes can be heard in many textbooks and anthologies used in public schools.

Historical critical approach to religion
The historical critical method uses the same critical methods in examining religious texts and their historical accuracy as an historian would use for any other figure or event. It works primarily through an analysis of texts and other historical objects to examine evidence for what happened in times of religious development. The approach addresses questions such as: Did the events that religions narrate actually take place? Did the people say and do what religions say? Who wrote the text? What did that person know? Was he a witness to the events? Did he have an agenda? Was he careful as an observer? What other sources did he have or depend on? Do we have an accurate copy of the original text? Was it altered or copied in some way? Are there other copies of the text that have discrepancies? Who was the intended audience? Was the text's report of the events tailored to meet the needs or desires of that audience? For the academic world this approach is considered highly productive. But it is also highly controversial. Many of the results of this research challenge the claims of established religion.

Religion in the social sciences
The social sciences have played a major role in the critical study of religion and teaching about religion through the insights and discoveries of these disciplines is a path one can take in the classroom. A critical component of this approach is the insurance that students understand the scientific methodology of the social sciences and the manner in which data and evidence are used to construct theories that are always open to critique and further testing. It is often crucial, for example, to make clear the differences between quantitative research and qualitative research, the role of statistical analysis, and the issues of confirmation and disconfirmation that are nearly always present in the dialogue and debate about religion that arises from the research.

Philosophy of religion
The philosophy of religion is an approach that offers a rational critique and evaluation of arguments and evidence for the truth or falsity of religious beliefs. These evaluations are, of course, normative for the most part, although often the approach offers a precise description of the historical justification of aspects of religious dogma and doctrine. Topics that tend to dominate this form of inquiry include examinations of the proofs for the existence and characteristics of God, the nature of evil, the concept of divine creation, the hope for life after death, and the existence of the soul. Another common focus is the problem of theodicy -- attempts to explain the nature and presence of evil. The discipline also explores broad areas of human concern related to religion, such as the religious justification for ethical decisions on matters like the death penalty, abortion and homosexual lifestyles, as well as conflicts between science and religion. More recently philosophers have been studying the nature of religious language and the role of the symbolic in understanding the meaning of religious expressions.

Hermeneutical approach to religion
The hermeneutical approach addresses the basic question of meaning. It is one of the oldest, most well established and yet least known approaches to the study of religion outside the scholarly world. It’s original focus was the problem of translation. It asked, how can we assure that the translation of religious texts preserves its meaning for the new audience? Later the question of meaning was broadened to include the general ‘sense’ of the message from the scriptures. And finally, as it is presently practiced, it recognizes the existential function of religion in giving life meaning to adherents and observers through all the means of communication, including ritual, symbol, and religious practices in general, as well as scripture and commentary. While the question of ‘meaning’ is often so abstract that novice students find it difficult to work with, once it is made concrete as a human search for identity and self understanding, it becomes far more accessible.

Phenomenology of religion
The scholarship coming from the phenomenological study of religion focuses on the experiential aspect of religious life from the point of view of the ‘insider.’ The primary goal of the approach is to come to understand the meaning of the experience without imposing judgments concerning the truth or the reality of the objects or beliefs these experiences may imply. The researcher examines the context of the
experience seeking to understand how that context shapes the experience but at the same time looking at how the experience may determine or influence the meaning of the broader context.

**Disasters and mistakes**

**Teacher using religious studies classes to advocate for their own religion**

Imposing religious views on their students, or worse, insisting that students conform or pretend to conform to the teacher's beliefs and attitudes in order to earn high grades is a sure formula for failure in religious studies courses. Naturally, in sectarian schools one of the assumptions of the course may be a common agreement on certain matters of faith. Still, even in those circumstances, and certainly in non-sectarian schools, the disparity in power between teachers and students renders unethical any intrusion on the students' search for their own religious identity. And this disparity certainly prohibits ethically a teacher using the classroom to proselytize and convert for his or her own tradition or disparage the beliefs of another.

**Teachers fearfully excluding all discussion of religion from the classroom**

Many teachers fear allowing students to openly discuss controversial religious issues in the classroom. The discussion might get out of hand. Students may ask insulting questions. Students might express ideas that are intolerant, prejudiced or even crossing the line into hate speech. The students' passions may become heated to the point where personal insults occur. These are not empty concerns. All have happened in my own teaching.

In spite of these dangers, I would argue that critical dialogue and discussion about religious conflicts and disagreements are an integral part of religious studies. Civil and intelligent dialogue and debate about religious issues is a skill that is severely lacking in our media and our political leaders. Yet such skills are critical for making ethical and political decisions both individually and communally. One of the overarching goals of religious studies classes should be to teach and model them in the safety of the classroom.

The focal necessity here is 'safety.' Students must be confident that their ideas, even those that are rough and ill formed, should be respected and allowed. At the same time they must be taught how to listen and reflect on responses and criticisms of their point of view. The only way to insure a safe place for such dialogue is to make clear the rules and restrictions that constitute civil and tactful discourse and to clearly define what these rules mean in practice. For example, students can freely express their ideas as long as they do not personally attack another student, denigrate a faith tradition, use derogatory epithets or labels, or lapse into hate speech. It is important to remember that students may not recognize they are breaking these rules. In those cases, you must clearly point out the violation and explain why the incident crossed the boundaries. For example, the concept of 'hate speech' is both legal and ethical, but students may not know it when it happens. I often spend significant blocks of time making clear what it is and explaining why it violates the rules.

**Mixing the practice of religion within the study of religion**

One of the fundamental principles of religious studies is not to mix teaching about religion with the practice of religions. Here again the institution context of the class determines the policy any teacher must follow. In American public schools practicing religion in any way violates the constitutional dictum of separation of church and state. In sectarian schools, on the other hand, some kinds of practice (prayer, meditation, devotional liturgy) may be mandated. Generally, however, I believe it is unwise to mix the two.

This is a bit odd pedagogically. How can you teach mathematics without having the students practice mathematics? How can you teach language without instructing students to practice speaking and writing in that language? Nevertheless, for a diverse student population, insisting on any kind of religious practice as part of the curriculum may constitute a deeply objectionable violation of a student's faith and tradition. For example, it is quite acceptable to ask students in a world religion class to attend and observe a religious service of a faith not their own. But one should make clear to the class that they need not participate in that service if they choose not to. Similarly, it is one thing to explain to students the techniques of Buddhist meditation. But requiring them to 'try it out for themselves' may challenge a conservative Christian's sense of propriety.

Again, in a religious studies classroom, student safety is a primary necessity, and this implies sensitivity to their concerns and a rigid observance of their individual rights. Above all the classroom must be made safe for minorities. This is true even if you are not aware of a minority presence. All too often students will not easily reveal their religious background, especially when they know they are outnumbered. It is
far too easy for such students to be silenced, intimidated and even insulted by a vocal and persistent majority. The teacher's job is to make sure this does not happen.

Conclusion
My basic point is that teaching about religion requires special consideration and planning given the sensitivity of the subject for many individuals and communities whose children may be involved in the curriculum. The laudable intent of offering just the facts without evaluation will not solve the problem. The very selection of "facts" and their organization reflects a series of implicit value judgments that may lead to tension and conflict. On the other hand, I believe it is our obligation as educators to take on the task of informing the next generation of the enormous complexity and power of religious traditions explaining the role these traditions play in the dynamics of the global village. I offer below a small sample of resources that I hope will be helpful, at least in the short run. You are certainly welcomed to contact me with questions, suggestions and observations. I will be happy to help in any way I can.

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Liminality and the cohort experience:  
Exploring the transformative education of pre-service teachers  
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Introduction
The crux of this paper is a re-imagining of the urban cohort educational experience through a spiritual framework guided by Victor Turner’s (1982) concept of ritual liminality. We will argue that the cohort educational experience, a truly liminal state between student and educator, can be an ideal and safe setting to celebrate this liminality by rejecting pedagogical methods mimicking dull routines where students arrive on time, sit politely, take notes, and raise their hand to speak. We should encourage, instead, wilder rituals of playful creativity, marginalized critique of established pedagogical method and experimentation with ideas, approaches and techniques that can form the foundation for an energized and dedicated teaching career.

True education is a transformative process. People change as a result of their educational experiences, which are not just a matter of acquiring knowledge, data and information, although these are important. Through education, people change in status, in their relationships with others, their identity, their language, and often their dress. What defines “success” in education is also a wider concept than knowledge and skills. The term must also take into account how well the educational structures and activities enable the student to engage in this transformative process, separating from the pre student state, then entering the educational community, and finally encouraging commencement into the professional world with all the attendant privileges and responsibilities that go along with a new status. Education in its broadest sense may be seen as primarily a ritual activity. The concept of “ritual” here does not refer so much to the act of worship (a primarily religious context) but to the process by which traditions, norms, symbols, meanings and world views are transmitted from one generation to the next. It is the process by which a child learns to become an adult with a social position and the self understanding that is required for membership in the over arching social matrix.

The notion that such transmission is a ritual process comes from the work of Arnold Van Gennep (1960) who coined the term “rites of passage” to describe the complex structures societies use to make these transmissions happen successfully. Van Gennep theorized that the ritual process takes place in three major stages: separation, transition and incorporation. In the initial stage, the individuals or groups to be initiated are separated from their family and society, cut off from any social interaction, and placed in a social and often geographical region where their status and identity become murky and ill defined. In the transition stage, later called the “liminal” stage by Victor Turner (1982), the initiate experiences a state of freedom from previous social constraints and a period of creative ‘play” or experimentation with symbols, norms, dress, action, identity, and meaning. He or she bonds with other initiates as they establish community goals, overcome obstacles, and endure ordeals that are all eventually crucial in forming new identities with titles and rewards that prepare them for the final state. In the final stage of incorporation, the initiates are ritually reintroduced into the larger society with the recognition that they have now the status and the skills to take their place as adults, bringing with them a renewed understanding of cultural, social, religious, and practical values.

Victor Turner (1982), in his analysis of these kinds of ritual process, focuses on the transitional or “liminal” stage as the one that has the most powerful, formative consequences. The “liminal,” according to Turner, is a state of being we experience while passing from one stage of life to another. It is the state of being “in between” these two stages so that one’s identity, perspective, and experience are independent of either the stage one is leaving or the state one hopes to enter as the culmination of the ritual process. For Turner, this “marginal” state can be extraordinarily creative because the independence it brings allows for the possibly innovative perspectives on and critiques of both past and future possibilities that can be developed and ultimately made practically useful in the culmination of the process. The collective experience can be a time of life filled with energy and excitement.

Liminality and the cohort experience
Manning (2000) holds that all college life is a liminal stage for students. It is a period of significant change where students develop autonomy, purpose, integrity and competence while still in an interim stage of life where they still depend on their parents for support and guidance and yet strain to find independence and autonomy. We have come to believe that re-visioning and re-understanding the cohort educational experience in terms of Turner’s concept of liminality is particularly enlightening both as a
way of understanding the complexities of that experience, but also as a fertile ground for proposing
approaches to both classroom instruction and administrative structures for the cohort members. Once we
become aware of the basic facets of educational liminality, we can ask the question, “What educational
techniques, modalities, and methods will best promote a successful educational experience and ultimately
a fulfilling career in education?”

Cohorts are often employed as an administrative arrangement designed for the convenience of program
delivery. Generally, students beginning in a program are grouped as a cohort and move through the
program of study together. Pragmatically, the cohort arrangement is often the best (most efficient and cost
effective) way for a college or university to deliver a program at a distant site. Once a cohort is
established, it is easier to plan course delivery, disseminate information, and meet the needs of the
students because the students are at the same point in the program sequence. In addition, the
administrative unit has some guarantees that the minimum number of students required to provide each
class will be in attendance. Seifert and Mandzuk (2006) offer two other justifications for the use of cohort
models. First, cohorts may create mutual intellectual stimulation among the members, thus resulting in a
richer educational experience. Secondly, cohorts may facilitate social ties among the members that will
support the preservice teachers throughout their programs and carry into their professional careers. It is
these two important benefits of cohorts that align most effectively with the liminal experience.

The CCAC/IUP Collaborative Elementary Education Program was designed as a cohort program, and
currently runs three cohorts simultaneously. The program is delivered at the Community College of
Allegheny County (CCAC) in Pittsburgh, Pa., approximately 70 miles from Indiana University of
Pennsylvania (IUP), the University providing the bachelor’s degree. When this program was designed, it
was recognized that the cohort model would be essential to its success. We will use this program as our
primary example of ways in which the benefits of using cohorts align with the liminal experiences of an
undergraduate teacher education program.

Characteristics of liminality
What are several important characteristics of the liminality and how might we design programs that will
best make use of these characteristics? Liminality begins with separation; promotes communitas; is anti-
structure, ludic, and creative; promotes personal transformation; leads to action; and ends with
incorporation. We will consider each of these characteristics in relation to the cohort experience and make
connections and suggestions relevant to the educational experience as a whole.

_Liminality begins with separation._ Cohorts by definition work in relative isolation from other members of
the educational community. This isolation may, at first, be frightening and lonely. “What am I doing
here?” has no answer. Murray Stein described the characteristic feeling of those entering the liminal space
as having

An unusual degree of vulnerability to sudden emotional drafts originating either within or without, to
sudden moods and highly charged images and thoughts, to sudden gains and losses of confidence. Inner
ground shifts, and because the base is not firm a person can be influenced, pushed, and blown about. A
sudden happening will make a more than normally deep impression, like an imprinting. More malleable
in liminality than otherwise, a person may carry the effect of such imprintings through the rest of a
lifetime (McWhinney & Markos, 2003, p. 26).

But this isolation can also foster an exciting and innovative educational environment.

We attempted to create liminal spaces where we could step away from the scripted stories of the school in
order to negotiate a curriculum of diversity, a curriculum that fit the moment and the lives being lived
there (Phillion, Ming, & Connelly, 2005, p. 287).

Students in cohort programs are likely to experience the vulnerability described by Murray to a greater
extent than most students in traditionally designed programs delivered on a main campus of a university.
This is because cohorts are more likely to be used for programs at distant sites, graduate programs, and
non-residential programs that include a greater percentage of non-traditional students. In general, these
students often experience a “lack of belonging” to the university. In addition, non-traditional students
usually have many conflicting demands on their time such as full or part-time work, family concerns, and
financial burdens. Students in cohorts may be second-career individuals who need to develop confidence
in their new choice of career.
The educational environment in a cohort, while it may be exciting and creative, is often reflective of the vulnerability of the students. They may request many specifics for a project and rely on the instructor to provide a great deal of encouragement for their efforts. Students tend to want to know a lot about the instructor’s experiences rather than make an attempt to create something new and innovative in terms of education and what schools should look like.

**Liminality promotes communitas.** Liminal cohorts experience a sense of increased community, equality, bondedness, and cohesiveness (communitas) as a result of their separation. Instructional methods that encourage, sustain and reward this sense of community rather than ignoring or working against it will be far more likely to be successful. Dinsmore and Wenger (2006) describe community-building activities that they included in their curriculum and implemented on a daily basis. For example, they used daily songs, cooperative-learning strategies, group projects, ice breakers, games, and “energizers.” In addition, they describe the use of “house-cleaning”, a time set aside in each course for the airing of students’ problems and concerns.

In the CCAC/IUP program, we have included some of the same strategies. One of the most effective activities that we believe builds community in a cohort is the use of study groups, either at students’ homes or at school. Some of the more successful cohorts with which we have worked (in terms of their sense of community) have been ones who have a student-sponsored website, chat room, and email distribution list. Cogorno, Radencich, Thompson, Oropallo, Fleege, Harrison, Hanley, and Gomez (1998) note similar recommendations for enhancing communication but include the recommendation that cohorts focus on self-regulation. Building on Rayner’s work, Cogorno et.al. note that goals of such self-regulation would be using “positive peer-pressure”, continuously working on the development of the cohort, and understanding that group discipline is a learned and practiced set of behaviors.

**Liminality is anti structure, ludic and creative.** Manning (2000) notes that liminal rituals function to promote communitas and that in order to do so they must counter the structures of academic institutions promoting a safe realm of anti structure. The anti structure usually takes the form of humor and laughter. This anti structure in the academic community, however, is rarely confined to ritual events. Rather, in Manning’s terms, it "leaks" to other aspects of campus life. Students are expected to “push the limits of structure thought original and creative use of language, symbol, music, and movement.” These quasi ritual behaviors, while potentially dangerous in some cases, nevertheless have the benefits of allowing participants to grow individually, form new relationships and work for social change (Manning, pp. 71-72).

**Liminality promotes personal transformation.** The ultimate goal of the educational rite of passage is provide ways the student take on the new identity as a functioning member of the broader society. The process requires a partial rejection of the pre liminal identity and this may involve significant anxiety and even fear. Students will be facing the daunting question, “Who is the person I am becoming?” Successful cohort programs will allow the possibility of experimenting with novel and untried self images in a supportive and egalitarian community that will not reject or shun the experimenter.

Much of the transformation from student to teacher happens during field experiences. Unfortunately, these field experiences may be supervised by different professors and the students may not be brought together as a group to consider their growth and reflect upon the transformation they are experiencing. Collins (2006) asks an important question: “Do adult learners in non-traditional formats develop cognitive complexity?” Her study results indicated that classroom atmosphere, instructor techniques (higher level discussions in class), discussions with peers, and evaluation methods all had the potential to help students to develop more complex ways of thinking. These four components are a focus for students educated in cohorts, as discussions often become deeper as students feel a sense of comfort and safety with their group.

**Liminality leads to action.** According to Cogorno, et al( 1998), teacher educators have very few agreed-upon strategies through which to assist preservice teachers to develop a social conscience. With the constant pressure to make it possible for students to graduate with fewer and fewer credits, we have seen that courses in professional ethics are among the first to be eliminated from the curriculum. Recently, our university eliminated the Foundations in Education course, one that previously allowed for a great deal of discussion of the ethical behavior of students. Therefore, it becomes important for each course to include discussions that will help students to develop their social consciences. Turner is clear that the move to
action is complex and multidimensional. The impulse to change one’s social, political, economic and religious environment often arises from the experience being outside and excluded from everyday routines, even when that exclusion is only temporary.

Liminality, marginality, and structural inferiority are conditions in which are frequently generated myths, symbols, rituals, philosophical systems, and works of art. These cultural forms provide men with a set of templates or models which are, at one level, periodical reclassifications of reality and man’s relationship to society, nature, and culture. But they are more than classifications, since they incite men to action as well as to thought. Each of these productions has a multivocal character, having many meanings, and each is capable of moving people at many psychobiological levels simultaneously (Turner, 1969, p129).

What is crucial is the possibility that temporary marginalization will lead to a deeper empathy and understanding with those whose liminality is more permanent because of their place in the social hierarchy. As Gloria Ladson-Billing (2000) points out:

Those occupying the liminal position do not seek to move from the margins to the mainstream because they understand the corrupting influences of the mainstream – its pull to maintain status quo relations of power and inequities. This liminal view is not unlike the view from the bottom that poor and working-class people have on the middle class. The poor and working classes have a perspective on their own experiences while simultaneously grasping the fundamentals of the workings of the dominant class.”(p. 263)

Liminality ends with incorporation. Cohort programs must prepare the student for eventual entry into the mainstream society with appropriate skills and credentials that allow her to function successfully with her new identity and position. But the program must also promote and celebrate this transition with rituals that offer public recognition and affirmation both from the members of the liminal community, society at large, and especially members of their profession. How can the program insure that these new members will be recognized, mentored, encouraged and valued in their professional life?

Conclusion

In our work with cohorts, we have found that some work very well together throughout their program, some begin slowly and improve, and some never really “click.” This has led us to study the research and to reflect upon our practice in order to find the reasons for the superior success of some cohorts. In the literature, the single most important factor that seems to lead to satisfaction with the cohort arrangement is the development of the sense of community. Various methods and techniques are suggested such as team building exercises. Another important factor is the instructors’ ability to keep their finger on the “pulse” of the group, intervening if necessary.

The paper attempts to look at cohorts as a means of facilitating the growth and development of the individuals in the group, helping them to make the transition from student to teacher and from observer to leader/participant in the educational process. A cohort can support the student as she moves through the liminal experience of higher education. At its best, a cohort can supply the environment that is conducive to promoting personal transformation, development of a social conscience that will assist in the professional world of education, and allows for the preservice teacher to experiment with ideas in a safe environment.

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Students’ views of language use at two different science programs
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Introduction
To get an idea of students’ views of language habits a questionnaire is a relevant starting point for a research project aiming at getting a closer understanding of how students develop subject specific academic language knowledge during their studies (3 vs. 3.5 years of length). In a final thesis students also at vocational programmes like these two, today are expected to prove their proper subject knowledge using an adequate academic language in a final thesis. The Swedish governmental arguments for the academic skills required at these formerly very practically designed programmes, are above all the fast changing society where all professionals continuously are considered to need updating their professional skills and reflecting over their work practices. Many of these students often do not understand the importance of developing academic language skills for the practical work they expect to meet and practise in the future in the science classrooms or the medical laboratories. The double requirement, in this case the development of practical skills as well as the academic skills, however, for many of them is an unexpected challenge. To a very large extent the academic skills required are based on the language typical of scientific contexts. Moreover many of the students are second language learners, a fact that does not make it easier to achieve the required language goals. Still another complicating aspect is that a great deal of the course literature is in English.

Background
Today it is well known among language researchers that the tools for meaning making are context and subject specific (Halliday, 1994; Johns, 2002; Schleppegrell, 2004). Subjects fulfil different purposes and are hence constructed differently. Language tools used in science are those discursive tools needed for definitions, classifications, lab reports and explanations. Where science subjects aim at describing and explaining the organisms and the world, human sciences on the contrary aim at understanding how human identities are constructed differently, as to time, gender and class, etc. These subjects are hence differently constructed, mainly by narrative language tools. In academic contexts written language is still considered the most important language tool, though the status of the written language in fact is undergoing changes (Baynham, 1995). New technology brings new ways of meaning making. The expression “the great divide” (used about written language skills among people – the divide is the difference between literate and illiterate people in the world) is challenged by new literacy practises. The fast changes today might be due to the impact on young people of the new language tools used in new media (Mediapro, 2007).

Meaning making processes in science are linguistically very complex, and researchers have found that multimodal language tools are far more often used than oral or written language alone (Kress, 2003, Kress & van Leeuwen, 2001). Among such tools different visual representations like figures, diagrams, tables and pictures can be mentioned. Thus, understanding the school science text books today means that you need to consider the combination of different modalities used. It might sometimes be true that “a picture call tell more than a thousand words”, but very often pictures tell us something else than words do, and they are simply used to fulfil other functions (Kress & van Leeuwen, 2001). Cooperation between linguistics and science researchers might shed a light on how students, for instance, combine language tools to make meaning and this in turn might have an impact on the way we assess students in educational science contexts in the future.

Method
The teacher students participating in the project are totally nine, 8 female and 1 male. This is the total amount of students applying for science teacher studies (children up to 12 years of age) last autumn. The biomedical students participating are 25, 19 female and 6 male students. This is far from the total amount (around 50) of students accepted for the biomedical analyst programme last autumn. These were the students present at the day when the questionnaire was made. The students had a science lecture which was not obligatory. The age of the students is between 19 and 44. Many of the teacher students are rather young, about 22-23 years old, whereas the age among the biomedical students is more widely spread. The students have very different study experiences before they started this programme. Many of them have already experienced university studies of different kinds and lengths, or they have working life experiences of very differing kinds (from working with horses to ICT). Three of the teacher students have Swedish as their second language; six Swedish as their first. Twenty of the biomedical students have Swedish as a second language and five have Swedish as their first language. The first language
represented is Persian, Arabic, Romanian, Spanish, Hebrew, Italian, English, Macedonian and sign language. Many of the biomedical students have arrived in Sweden as refugees or close family members to refugees as teenagers or even adults. This of course has consequences for their second language skills. The immigrants among the teacher students were either born in Sweden or came at an early age.

A questionnaire is an appropriate way to gather information about the participating students’ backgrounds and their opinions of the language used in their study programmes. It also makes possible the choice of a cohort of students for a closer study further on. The research methods will otherwise be based on sociosemiotic ethnography (Vannini, 2007), where qualitative data is collected: observation protocols of different language practices, iterated interviews with a few representative students and also texts will be collected, used and produced in the professional contexts of each programme. The questionnaire was filled out in close connection to an early morning lesson or lecture in both groups. The researcher was present, and the project was shortly presented for the students. They also got a written argument about the project and the normal ethic research rules as to their participation.

Results
There are two types of questions: closed and open ended. All questions are not always answered by all students, and sometimes students give more than one answer to a question. The translated questions and the results in percentage where possible, are presented in the appendix. Below the similarities and differences are described and shortly discussed.

The similar answers concern the estimations of the students´ language skills and what they consider typical for the subject specific language. A great majority of both groups is rather satisfied with their language skills in Swedish as well as in English. However, the teacher students seem a bit safer in their Swedish language use. As to the English language skills the results show the opposite. One could expect the opposite here because of the amount of students with Swedish as their second language. A very great part of immigrants in Sweden come from countries where the English language is not as important a part of their education as it is for the Swedish children. The opportunities practising English usually is less frequent in the countries immigrants have left for Sweden today. In this case the results can at least partly be explained by the language backgrounds of these students. They do not belong to the most common immigrant groups in south Sweden (Arabic speaking). One of them even has English as her/his first language. Anyway, 20% of both student groups are unsatisfied with their English language skills. This is worth noticing because of the great amount of course literature in English, especially in the biomedical education. The question is relevant to ask because in both groups some or a great part of the course literature is in English.

As to their science skills the students estimate them as rather high. Nobody among them finds his/her science skills insufficient. This is of course what one would expect considering their choice of study programme. A discussion with the teachers, though, indicates something else, but this might get an answer later in the research project. Both student groups also consider language skills important for their studies and their future jobs. They also give rather similar answers to the questions considering the importance of visualizations in their study programme. Both groups consider visuals a typical kind of language in their subjects, and they also seem to have almost equal opinions about getting help to understand science phenomena and processes when described visually.

To sum up the similar answers concerning the students’ opinions about their language skills, they seem to be quite content with their subject knowledge and how they cope with the language. One explanation to the minor difference between the teacher students and the biomedical students as to their Swedish language skills could be the differences as to their first languages and the length of the time spent in Sweden for the Swedish as a second language learners. According to Thomas and Collier (1997) it takes at least 5-7 years to learn school subjects in their second language. Among the biomedical students a few have arrived in Sweden as refugees only some years ago, as teenagers or above in age. It is quite normal that their knowledge of Swedish is not as good as for those immigrants who spent many years in Sweden or those born here, which in fact a great deal of these students were. That some of the biomedical students are good at English is due to their language background. On the whole, the answers as to the above mentioned questions are quite similar.

Different answers
As to the rest of the questions with closed answers the differences concern how the students estimate their language use in different language practices in their respective programmes. They also differ as to
strategies used in case they need linguistic help and also as to their considerations about the responsibilities as to success or failure.

As to language use in different language practices the biomedical students seem to estimate their capacities a bit lower than do the teacher students. As to oral individual language use there are 8% among the biomedical students who say they do not cope very well orally. Also as to written tasks the biomedical students find it more difficult than do the teacher students (20% against 11,1%). The biomedical students according to their answers also make use of visualizations more often than do the teacher students. 29% of them answer that they very often do use visualization where the amount here is 0% for the teacher students. There are also differences concerning the answers about learning strategies, the difficulty of the course literature, the time spent on tasks, and the responsibility for success or failure. Interestingly, the groups seem to use different strategies when asked about what to do if they have language difficulties. As many as 43% of the teacher students would ask the teacher for help, where only 17,6% among the biomedical students would use this strategy. Also a greater percentage of the biomedical students would ask a mate to help them solve language problems. Here the figures are 44,1% for the biomedical students, against 28,6% among the teacher students.

Astonishingly, also the teacher students seem to rely much more on the teacher for their success. Here 30,7% of the students estimate that the teacher is important for their success, whereas among the biomedical students only 15,2% give this answer. The mates and the family seem to be more important for the teacher students as to this question than for the biomedical students. Here the figures are 15.4% for the teacher students, but only 9,1 for the biomedical students in both cases. Both of the student groups give themselves the greatest importance for success or failure.

Also the biomedical students seem to find the course literature more difficult than do the teacher students. No one of the students seems to find the literature too difficult, but many among them answer that it is difficult, whereas the teacher students to 88,9% answer that they understand most of it. There are also differences as to time spent on tasks at home. Among the biomedical students 44% estimate time spent on this more than one hour daily, against 0% among teacher students. 0% of the biomedical students spend less than one hour every day on these tasks, where 12% of the teacher students answer that they spend less than an hour every day.

To sum up the differences, they have to do with language use, learning strategies and work with literature. The biomedical students’ answers implicate that they are not quite as sure in their language use and that they spend more time on their studies as do the teacher students. The two groups also seem to have different opinions as to the importance of the teacher for their study success, and they rely unequally on their families and mates for the results of their studies.

Some reflections to this are the amount of time spent at the university with teacher led teaching. The biomedical students spend a lot more time at the university than do the teacher students, and the same counts for the teacher lead teaching hours. This is obvious when studying the schedule for the both groups of students. Also the teacher students work far more together in groups on their own, discussing literature and solving problems together. As to the biomedical students they hitherto have not been given other opportunities for group discussions than in the laboratory, working in pairs or small groups of three together. The language used during laboratory work is to a great extent procedural, which means that the language used mostly is accompanied by doing the laboratory work on the same time. This in turn means that they do not have to use many of the topic typical content words.

Answers to some of the open ended questions
There are a few questions with open answers. The explanation to this is the interest in getting an idea of how students describe the language activities going on in their study programmes, because research repeatedly shows that language needs to be actively used by language learners in many contexts to be properly learned. All students are during their studies language learners to a certain level, and even more so if the language is not the first language or the language of every day use. In questions 4 and 16 the students are asked to exemplify the language practices at the university, and outside the university. Here students normally give more than one answer/example. In table 1 (question 4) and 2 (question 12). The answers are summarized using the verbs or adverbs mentioned by the students. All student answers given are in the table, which explains the many iterations. The reason is to try to find out how students describe the language cultures of their programmes. The language practices mentioned might give a hint about how actively the students are expected to use the subject specific language. The answers of the biomedical students are written in bold type.
<table>
<thead>
<tr>
<th>Speaking</th>
<th>Reading</th>
<th>Writing</th>
<th>Listening</th>
<th>Counting</th>
</tr>
</thead>
<tbody>
<tr>
<td>discussing</td>
<td>reading books</td>
<td>writing</td>
<td>understand</td>
<td>calculate</td>
</tr>
<tr>
<td>explaining</td>
<td>reading Eng</td>
<td>a reading log</td>
<td>interpret</td>
<td>calculate</td>
</tr>
<tr>
<td>asking questions</td>
<td>literature</td>
<td>writing</td>
<td>understand</td>
<td>calculate</td>
</tr>
<tr>
<td>communicating</td>
<td>reading</td>
<td>taking notes</td>
<td>understand</td>
<td>calculate</td>
</tr>
<tr>
<td>telling facts</td>
<td>listening</td>
<td>written tasks</td>
<td>lectures</td>
<td></td>
</tr>
<tr>
<td>explain answers</td>
<td>reading course</td>
<td></td>
<td>explaining</td>
<td>teacher’s lectures</td>
</tr>
<tr>
<td>explaining</td>
<td>literature</td>
<td></td>
<td>explaining</td>
<td></td>
</tr>
<tr>
<td>explaining to others</td>
<td>reading while</td>
<td>writing lab. tasks</td>
<td>must understand</td>
<td></td>
</tr>
<tr>
<td>speaking with supervisor</td>
<td>be able to read</td>
<td>reporting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>explain something</td>
<td>course literature</td>
<td>answers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>talking to mates</td>
<td>be able to read</td>
<td>examinations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>oral tasks</td>
<td>(interpret) tasks</td>
<td>taking notes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>working with mates</td>
<td>reading tasks</td>
<td>write answers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>talk to the teacher</td>
<td>read books</td>
<td>on examinations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>express myself</td>
<td>the course literature</td>
<td>taking notes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>explain experiments</td>
<td>much book reading during lectures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bodily processes</td>
<td></td>
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</tbody>
</table>

The answers of the two groups differ and they point at different language cultures of each of these programmes. They indicate that the teacher education is a far more oral culture than is the biomedical analysts’ programme. The teacher students are talking and discussing, explaining and working in groups with their mates, they have oral tasks. They read books, but the following discussions seem to be more common and important. Their writing habits are also more informal; they write their comments while reading a common book, or they take notes.

The answers of the biomedical students point at a much more heterogenous linguistic landscape. There are more different language practices mentioned, but the most part of them seem to consider reading and writing activities, indicating individual communicative acts and a far more monological teaching culture. The activities seem to be trying to find “the right answers” through reading and writing, not more creative problem solving tasks. They hardly ever mention working in groups discussing some scientific questions. These answers are given during the second study semester, and they might not yet have experienced all language practices of the programme. But so far the language cultures seem to be interpreted very differently by the students.

**Answers to question 12**

Question 12 considers the learning strategies the students say they usually use in order to learn the content of the courses. In table 2 all student answers are written. The answers given by the biomedical students are also here written in bold style. The question concerns how the students figure that they learn the content. Interestingly here the biomedical students mention using oral strategies like talking and discussing with their mates more than during time spent at the university. The biomedical students also seem more goal directed than do the teacher students. They seem to know more about different learning strategies, and their answers point at a more active individual learning. They mention underlining important parts of texts, using important words (concepts), looking up answers, and they combine writing and reading. The answer “coming to lectures” is not as strange as it might seem. The lectures are optional, but the laboratory work obligatory. Coming to the lectures actually means that they choose to come to listen to how the teacher structures the content to help them understand the content better when studying on their own later.
Table 2: Learning strategies of two different groups of science students

<table>
<thead>
<tr>
<th>Talk</th>
<th>Read</th>
<th>Write</th>
<th>Listen</th>
</tr>
</thead>
<tbody>
<tr>
<td>oral use</td>
<td>reading my notes writing</td>
<td>rewriting notes</td>
<td>coming to lectures</td>
</tr>
<tr>
<td>discussing</td>
<td>skimming</td>
<td>writing a lot</td>
<td>listening to the teacher</td>
</tr>
<tr>
<td>studying with friends</td>
<td>rereading</td>
<td>taking notes</td>
<td>parts of texts</td>
</tr>
<tr>
<td>asking myself questions (why?how?)</td>
<td>reading again</td>
<td>underlining</td>
<td></td>
</tr>
<tr>
<td>discussing with a mate</td>
<td>rereading many times</td>
<td>rewriting notes</td>
<td></td>
</tr>
<tr>
<td>repeating</td>
<td>reading literature</td>
<td>marking important</td>
<td></td>
</tr>
<tr>
<td>using the words when talking to others</td>
<td>looking up the answers</td>
<td>in the course book</td>
<td></td>
</tr>
<tr>
<td>reading and writing</td>
<td>reading and writing</td>
<td>taking lots of notes</td>
<td></td>
</tr>
<tr>
<td>writing while reading</td>
<td>summarizing and trying to understand</td>
<td>what it is about</td>
<td></td>
</tr>
<tr>
<td>underlining</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

The results of the questionnaire must be seen in the context described above. They are not possible to generalize, but can only be seen as answers from these students, and answers given in a certain situation. They are to be considered as the starting point for a research project, which means that the intention is to get some background knowledge of the students and how the students understand the teaching and learning cultures at this point of the their study programme. The answers so far indicate two different language cultures, what might be important for the further research design. The questionnaire has given rise to the following questions out of which some will be chosen for a closer and continuous study:

- How do the textbooks used construct the subject? What language tools are used? (verbal, visual, other tools? Alone or in combination?)
- How do students really understand and use verbal and visual representations typically used in science contexts? How do they interpret multimodal texts? What do students consider difficult?
- In what ways does the teacher lead teaching time help the students in their language struggle? Is there explicit teaching about language?
- How do the students develop the academic language required specially in the final thesis?
- In which learning contexts are students given the opportunity to use the subject specific language?

References


Interdisciplinary understanding of Gothenburg
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Purpose
Our purpose here is to present a task given to undergraduate students at Gothenburg University. The students are trained to teach young pupils (1-12 years old). The task takes place within a course called Man, nature and society, an interdisciplinary (science, social science and technology) course that lasts for one year (for graduation, these students have to study for 3,5 years). We have interviewed three tutors – the students’ teachers during practice – and we present a few results from those interviews. The tutors are teachers in the north-east area of Gothenburg, an area with about 135 nationalities. We also present a few student comments on the task. These comments are taken from the evaluation of the course. Finally, we take the opportunity to ask a few questions regarding the field study. These questions are mainly focused around the concept discourse and deal with possible ways of making the students think and act “out of the box”.

The field study
The field study can be divided into three different parts. Firstly, the students are guided through some parts of Gothenburg. This “walk in the streets” works, to some degree, as an eye-opener for the students. We know from experience that not even those of our students who are born and raised in Gothenburg know very much about the city (history, geography, etc). Secondly, the students choose a small part of the city and prepare to use it as a learning area for pupils. The pupils in question, are those with whom the students work during their practice periods. They, the students, also carry through an excursion with the pupils. Thirdly, the students present their excursion, along with reflections regarding the whole work process, both live in the city and in written form (papers). Parts two and three are done in groups with 4-6 students each.

The task
The aim of the field study is that the students, while studying close surroundings, become aware of the learning potential of the world outside the classroom. They are also supposed to learn how to reflect upon different ways of using these close surroundings as learning areas. These goals are taken from the syllabus. In the instruction for the field study, we also request the students to use all their senses while meeting, as it were, the city. Here some excerpts from the instruction:

• Within the theme “The City as a Text-book”, your task, as a group, is to take responsibility for a field study of a chosen part of Gothenburg.
• Use the didactical questions “what?”, “why?”, and “how?” as starting points: What do you want your pupils to learn, why do you want them to learn it, and how are you going to teach them what you want them to learn?
• Make clear references to the literature we use in the course.
• You will plan and document an excursion as well as carry it through with a group of pupils. The excursion will also be carried through with your fellow students along with Bengt and Ulrika.
• You are supposed to hand in your documentation, your papers, as soon as your excursions are carried through. In these papers, you shall reflect upon the city as a learning area as well as upon the work process of your study group.

Theoretical framework
Our aim is that the students develop an ability to interact with the world as socially conscious human beings. This notion is based on Dewey’s pedagogical creed “I believe that all education proceeds by the participation of the individual in the social consciousness of the race” (Dewey 1980, p 38). We believe that establishing a meeting between the city and the student greatly enhances the social consciousness of the individual student. Maybe this, in the long run, enhances his/her active participation in society, both as a citizen and as a teacher. And this presumably goes for the student’s future pupils as well.

Moreover, this meeting lays the foundation for an interdisciplinary view of the world. As we all now, disciplines are man-made phenomena. It then goes almost without saying that the city as an arena for learning cannot be fully grasped if one sticks to strictly disciplinary boundaries; the city is best thought of as a multifaceted entity, incorporating nature-given conditions, anthropology and society as we understand that concept. Underlying this view is yet another one, the view that the only thing certain
about history, is that it is dynamic. In short, our aim is that the students develop an interdisciplinary way to dynamically grasp the world (man, nature and society ever evolving through time and space). Vygotsky once stated that “… the lack of vitality in our school was because the windows to the world were closed, and mostly so in the teacher’s soul” (quoted in Lindqvist 1999, p 243, our translation) and we strongly believe that our interdisciplinary and dynamical approach could be helpful for our students, the teachers-to-be, who hopefully will work with their windows open.

What teachers and students say about the task

Three teachers (tutors)

Three teachers have been interviewed. They all work in the north-east area of Gothenburg. The results from these interviews are somewhat discouraging: It seems like they do not leave the classroom very often and when they do, they certainly do not take their pupils to the centre of Gothenburg. They find it too difficult, which is to say, that travelling with 20-25 young kids on a bus or on a tram is way too hard to organize and practically do. There is one answer, though, that is more encouraging: One teacher actually says, that he, when a couple of students took “his” pupils to the city centre, was reminded that “there is a world outside school”.

Another comment from one of the teachers deserves attention. About those children in the north-east area, she said that “this is their world”. This has several implications, e.g. within what discourse do we conduct this field study? By discourse, we mean “a way of speaking, writing or thinking which incorporates particular things as given, unchallengeable truths” (Paechter 1998, p 2). (Please note that this Foucault-inspired definition implicates power and, arguably, rules out the possibility of a definition of discourse that is void of power dimensions.) We must admit that the task is constructed within a discourse that says that the centre of the city is important for historical, aesthetic, psychological and other reasons. This may not be the case within other discourses, but we, as white, well-educated middle class teachers, certainly have the power to see to it that our discourse becomes hegemonic in this particular situation.

One may also wonder what the democratic implications are. If the people of the north-east area have their world there, does it mean that we, who are the majority and who speak the language and who have jobs and who can afford to go to Porto etc, have our world in the centre of the city, close to the banking houses, the municipal administration etc? If that is so, one could argue that democracy demands that these people – the minority – get the opportunity to find that the centre also belongs to them. We therefore believe that we, as teachers, have a democratic responsibility to literally take these children to these streets and buildings in order to, at least in the long run, make them familiar with a world that should be theirs too. Maybe they simply have to get used to “the other side of the railroad tracks” from early childhood since they, perhaps, but this could be a thought from within the aforementioned discourse, were born on the wrong side of those tracks.

The students

After this part of the course, the students are asked to evaluate different parts of it, and among them the field study. From the evaluations, we draw the conclusion that it is a much appreciated task. The students find it relevant for their education, i.e. for their future jobs as teachers. It is also inspiring and great fun and, of course, lust cannot be underestimated as a motivator for learning.

Crucial questions for the future

While scrutinizing our task, talking to tutors and reading more closely the evaluations, we have become aware of a few weaknesses in our way of conducting the field study. We will not discuss them here. Instead, we would like to take the opportunity to discuss what do not know enough about. We do this by asking a few crucial (and admittedly interlocked) questions:

Do the students learn to appreciate the city as an arena for meetings across boundaries set by cultural phenomena? This demands the capacity to think “out of the box”, to walk a mile in somebody else’s shoes, or to transcend the discourse you are actually a part of. This is not easy, even if you are willing to try. We need further research before we can say anything about this. Most students are open-minded and interested in other cultures and other ways of thinking and acting, but if this results in profoundly new ways of meeting an (at least partially) unknown world, is open to suggestion.

Do the students transcend what they have taken for granted? According to the evaluations, some students claim that they see Gothenburg in new ways after the field study. We, however, have no way of knowing what this means. It could be that they are aware of some historical facts they did not know anything about
prior to the task. If so, the new knowledge is nothing more than a new set of facts. But if they actually develop a deeper sense of context, interaction etc is not clear and further research is needed here too.

Do they access new areas: geographical, emotional, social, economical, and historical? If not, one may wonder if substantial learning is taking place. Learning, of course, is a complex activity and a concept that defies simple definitions, but, according to our view, learning without personal development is not possible. This means for example that mere quotations of historical facts are not sufficient. There are some evidence from the students papers that suggest that deep learning is taking place, but this needs to be examined more closely. A related question: Can we hope that their pupils, in the future, access the new areas? This is, as we have already discussed, a question of democracy, citizenship and participation.

Do they struggle with the opposites? How do the students react, emotionally and cognitively, when their own world – the thesis – collides with another world – the antithesis? Again, we don’t know. One can, however, imagine that a cognitive dissonance emerges when the twenty year old upper middle class student confronts settings hitherto unknown for him/her. As well as for whole societies, one could argue that individuals only develop if the opposites they are confronted with form new theses, syntheses. Then, of course, the synthesis is bound to confront its very own antithesis. Thus, there is always a dynamical element at the core of things and nothing is ever static. As individuals, we may, for psychological or other reasons, wish things were otherwise. But what would be the root of change and development if that was the case? As teachers, we have to work with these dissonances, both within ourselves and within our students. This is essentially what we are trying to do.

References
What’s wrong with minorities? An analytical critique of contemporary usages
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How do we use the word minority and its pluralized form, minorities? What has been the word’s meaning? What’s wrong with the way we now use minority? Minorities—the word—has become a common way of quickly denoting groups of people and individuals, particularly people of color. Its use is uncritical with only the rare consideration of the ways it signifies, discursively reifies, and solidifies marginalization. This paper explores the evolution of uses of minority in English through the Oxford English Dictionary (OED), and offers suggestions for less discriminatory usage of the term.

Mathematical relationship
The etymology of minority lies in postclassical Latin minoritat- and minoritas with an 11th Century meaning of lesser amount, lesser size, and inferiority. The word has since become known in British and US English, Middle French, French, Spanish, Portuguese, and Italian. Minority describes a smaller portion of the larger whole; technically, any amount that is less than half of the total. In this sense, minority is a part-to-whole mathematical proportion or ratio. It is consistently used in reference to human actions and humans themselves, and is rarely used for objects. OED cites five references that apply minority to objects such as a book, a language, a country, and illnesses:

1. An old booke in broken English, which crept into the world in the minoritie of Printing (1631).
2. [The English language] is now as mature as Greek or Latin... It is in its minority no longer (1833).
3. If Britain keeps opposing this, it’s going to end up being in a minority of one (2000).
4. This disease doth sticke close to the patient, vnlesse it bee taken away by medicines in its minorit (1632).
5. The insufficiency of the mitral valve, which occurs in a minority of cases of exophthalmic goiter (1889).

The use of minority in sentences 1 and 2 are not common in the present, and 4 and 5 are technical and medical. Its usage in item 3 is the only contemporary reference. In the current U.S. lexicon, it would be awkward to use minority in reference to an object, but not so for majority. For instance one could say, “Fast food chains make the majority of restaurants on this street.” Such a sentence makes sense. While, “Locally owned restaurants are the minority of restaurants on this street,” is grammatically correct, it would confuse listeners. As an introductory summary, minority is used most often in reference to humans, and means a portion that is less than half of the whole, a lesser amount, a smaller size, or inferior.

In minority
The earliest use of minority in English emerges in the 15th Century (1493), and distinguishes the state of legal adulthood from the years of being a minor. In this case, minority refers to the lesser age and inferior status of youth as in these examples:

- The tym of our mynoryte we beand of tendyr age (1526).
- I...being young, and within minority (1632).

In this use, minority offers a cultural, legal distinction for youth with limited rights and responsibilities as different from people of full age. Minority remains a relational term distinguishing youth from the status of adulthood. It is a younger-to-older relationship. Minority, as a state, is presented as the object of a preposition (of our mynoryte, within minority), but the person in this state is the subject of the sentence. Minority, as the state of being a minor, is a time of protection from standard expectations as the following examples illustrate:

- Persoune...may at thair perfectioun of age mak renuocation...of thingis done prejudicall to thame in thair minorities (1493).

- When [Hercules] was a babe...Thus did he strangle Serpents in his Manus, Quoniam, he seemeth in minority, Ergo, I come with this Appologie (1598).

What is interesting about the majority of examples of this use is the ways the texts call attention to acts that contradict the expectations of minors as a protected class of people. For instance, Plutarch illustrates how despite being a minor Helen was married to Theseus:
- Theseus... stole awaye Helen in hir minoritie, being nothing neere to consent to marrye (1579).

Similarly Fuller argues:

- The minority of Princes ought not to lesson their Subjects reverence unto them (1642).

In both cases, the state of being a minority does not make one exempt from adult expectations. As minorities, Helen enters an adult relationship, and princes are considered deserving of reverence. In other words, the state of being a minor, in minority, does not necessarily mean that one is treated as such.

This youthful state also implies a time of learning as Dedekind describes:

- In the minority of my grammarschollership, I was induced...to unmaske these Roman manners (1605).

Being in minority provides for a protected liminal space where youth may learn the culture and traditions important to their particular social location. Even when the minor takes on adult relationships, such as marriage, the liminal space is maintained:

- A husband of full age... whose wife is in minority, shall be her curator during her minority (1920).

Thus, being in minority, not only describes a time of protection, but also a time of education, training or social adjustment with special attention to the development of the minor.

Youth grow out of their minority status in terms of their learning and physical maturation; it has a temporary nature. For example:

- She had now entered the last year of her minority (1782).

- A youth in England, emerging from his minority (1856).

Given that humans mature, barring death, from minors into adults, being in minority is a transitory state that one leaves upon maturation. This move takes the minor from a state of protection, when this liminality truly exists, to a status of expanded rights, freedoms, obligations, and responsibilities. In this use of the term, minority refers to a transitory state as a minor that is experienced by an individual, although a group of youth may be in minority in this sense.

In the minority

The use of the term as a designation for a subgroup distinguished from the majority begins in the 18th Century. In this early subgroup use, the distinction focuses on actions and views of a subgroup that differ from those in the majority. For instance an 1857 reference states,

- She, a Tory and clergyman’s daughter, was always in a minority of one in our house of violent Dissent and Radicalism.

The person in the minority and those in the majority are specifically identified. The reader is told how the person in the minority is situated in general (female, clergyman’s daughter, and Tory) and specifically within a house of radical dissenters. The minority view and the views of the majority are both known. This revealing of minority and majority holds true during use of the term in this time period, even when the majority is implied. A 1716 example illustrates this point:

- The Parliament of Great Britain, against whom you bring a stale accusation which has been used by every minority in the memory.

While the majority view is not explicitly identified, its presence and actions are known through implication. The inference is a political majority in Parliament criticizing the minority party for relying on frequently used tactics. In this reference, and others like it, the relationship to the majority in inferred, and the relationship between minority and majority is maintained within the text.

In more contemporary uses of minority as a distinguished subgroup of differing views or actions, the term makes a shift to include not only persons and local groups of people, but also international relationships. In Gender and Change in Developing Countries, Gerrard states of women,

- They were always in the minority when it came to the vote (1991).

Another example,

- If Britain keeps opposing this, it’s going to end up being in a minority of one (2000).

Here minority is applied to relationships that transcends national boundaries, yet maintain political minority status. Interestingly, those holding minority views continue to be the subjects of the sentences and described as being in the minority just as their counter group is described as in the majority. Thus minority continues to describe a state that is at least potentially transitory. Since it is something one is in, not something that one is, the possibility exists that one could move out of the minority. In other words, a person or a subgroup may be in the minority (or in a minority of one) given a particular constellation of views or actions. Should the dynamics reverse or the context change, one would move out of the state of being in the minority to being in the majority. Should the Tory woman, for example, move into a house.
where many Tory daughters of clergymen reside, she would no longer be in the minority, but in the majority. Likewise, given changes in women’s collective actions or numbers in voting they could garner enough votes to move out of the minority and into the majority.

Minority-majority tensions
Power relations are quite evident in the relationship between those in the minority and those in the majority, as these references indicate:
- *The tone of men, who are conscious that they are in a minority* (1809).
- *Conspiracies and insurrections in which small minorities are engaged* (1828).

In both of these examples, tension is implied, but the relationship between those in the majority and those in the minority frequently move beyond tensions. They hold the potential for violence, which is expressed explicitly, in the following examples:
- *To prevent your honours of the Majority and Minority from tearing the very flesh off your bones in contestation* (1765).
- *In a democracy, the majority of the citizens is capable of exercising the most cruel oppressions upon the minority* (1790).

Both of these examples illustrate that differences of views and actions between those in the majority and in the minority are not benign. In the 1765 reference, the potential for corporal violence is presented as a metaphor and as reality, simultaneously—“tearing the very flesh off your bones.” The 1790 reference, illustrates that within a democracy, tension between the majority and the minority can result in cruel oppressions. Clearly there is a sense of antagonism between the greater and lesser parts of the whole. This is not limited to differences expressed in views and actions. Even when minority describes the state of being a minor, tensions are expressed. For example,
- *Ivan…convened a so-called 'Council of Reconciliation’…to deal with the conflicts which had flared up during his minority [youth]* (1997).
- *When [Hercules] was a babe…Thus did he strang[e] Serpents in his Manus, Quoniam, he seemeth in minoritie, Ergo, I come with this Appologie* (1598).

In these two examples, the only ones showing tense relations in the *OED* examples of minority as the state of being a minor, the conflicts are presented along with means for mediation, apology, or reconciliation, thus, indicating a move out of conflict is possible, if not probable. Clearly, reconciliation is less likely if people resort to ripping flesh from bones (literally or metaphorically) or when cruel oppressions have been enacted. Even though these references continue to allow for a change in status or a movement from being in the minority to being in or of the majority, mediation or reconciliation is less likely when the once oppressed minority emerges as a new majority. This reversal sets up, at least, the potential for a cycling of cruel discrimination.

Being minority
Until the 19th Century, minority was used as a state or status that someone is in. Even in volatile situations, the potential for changes in status is present in the structure of the language. However, in the 19th Century, certain identifiable groups become minorities. This new usage materializes as a means to designate people(s) who differ from the majority of society in ethnicity, language, or religion. In this sense, minority is a label inscribed on people(s) based on an aspect that is primary to their personhood in phenotypic and socio-cultural ways. Race/ethnicity, language, and religion are all intimately connected to identity and culture. While people can assimilate into the dominant culture of their environment, changing one’s religion or learning an additional language is not easily accomplished, and may indeed be an unreasonable expectation, particularly in the short term. Changing one’s ethnicity, particularly as it intersects racial constructions, is rarely attainable or desirable. Examples of this turn to being minority follow, and reveal several patterns of interest:
1. *Though we go for the republican principle of the supremacy of the will of the majority, we acknowledge, in general, a strong sympathy with minorities, and consider that their rights have a high moral claim on the respect and justice of minorities* (1837).
2. *The nucleus afforded by a vast and unappropriated country for the establishment and growth of political and religious minorities transplanted from ancient states and hierarchies* (1855).
3. *All previous movements were movements of minorities or in the interests of minorities* (1888).
4. *According to the declarations of…the quadruple alliance, protection of the rights of minorities forms an essential component part of the constitutional right of peoples to self-determination* (1917).
5. These treaties provide for the protection of racial, linguistic, or religious minorities included within the boundaries of the specified States (1921).

6. By the year 2000, the U.S. population is expected to grow from 260 million to 275 million with most of this spurt attributed to minorities (1994).

Instead of being in the minority or in minority, people literally become minorities. The term becomes a label inscribed as one’s public identity. Minorities, however, remains the object of a prepositional phrase, thus the person is moved from the subject position to the object position in the sentence. Additionally, the word, along with the person it signifies, shifts deeper within the sentence structure. For example, minority was previously the object of a prepositional phrase that modified a verb or a noun, and referenced a person who was the subject of the sentence, as these examples illustrate:

- …he seemeth in minority… (modifies verb seemeth with he as subject of the sentence)
- …they were always in the minority… (modifies the verb were with they as subject)
- …they are in a minority… (modifies the verb are with they as subject)

With the shift, the person(s) become objects. Consider these simplified excerpts from the above late 19th and 20th Century examples:

1a)...we acknowledge...sympathy with minorities...
1b)...we...consider...justice of minorities...
3) …movements were…movements were movements of minorities or in the interests of minorities…

In examples 1a, 1b, and 3 minorities (representing people, not a state or status) is the object of a prepositional phrase and primary modifier of a noun and a we representing the majority becomes the acting subject in the sentence.

Minorities, representing persons, is embedded more deeply in the structure of sentence 2, 4, 5, and 6.

2) …nucleus...afforded (by a … country (for the establishment and growth (of … minorities)))…
4) … According to the declarations (of…the quadruple alliance, protection (of the rights of minorities)))…
5) …treaties provide…protection (of the rights (of minorities))…
6) …population is expected to grow (from 260 million to 275 million (with most (of this spurt attributed (to minorities)))))…

Minorities, in sentence 5, is the object of a prepositional phrase, modifying the object (rights) of another prepositional phrase, which modifies the noun, protection; it is a secondary prepositional object modifier to protection. Sentence 2 is more complicated. Minorities is the object of a prepositional phrase that modifies the objects (growth and establishment) of another prepositional phrase nested within a third prepositional phrase (by a country), which modifies the verb, afforded. Here, people have become a tertiary prepositional object modifier of a verb. Minorities, a word signifying people, has become a quadruple modifier of the verbs in sentences 4 and 6. In sentence 6, minorities is the object of a phrase modifying a verb (attributed), which clarifies the compounded phrase, with most of this spurt, that modifies the verb and prepositional phrase, to grow from 260 to 275 million.

Instead of a person as subject occupying a transitory state in the minority, people are shifted to the object position, embedded deep within grammatical structures. They have moved from being subjects able to act to objects incapable of action. Ironically, minority has only rarely been used to describe mathematical relationships among objects, yet has transformed humans into objects (of objects (by objects (in objects))). Additionally, things (like treaties, nucleus, and populations) become subjects of the sentences and act on minorities.

In earlier uses of minority, the majority was explicitly identified or implied. In these recent examples, the majority is hidden behind complex entities such as majority will and claims for justice (1837), a country (1855), reason for movements (1888), quadruple alliance (1917), treaties (1921), and U.S. population (2000). Clearly a majority exists in such entities, but exactly who makes up these majorities is not revealed. Of particular interest is that the unknown majority is capable of discrimination to the point that unbalanced power is an expectation requiring protection of the rights of minorities through treaties, principles, movements, and alliances—if not through a humanized discourse. Tensions between identified minorities and the majority are formally acknowledged, while protections (or at least attempts at protection) became formalized. Of course, protection for vulnerable groups is good, at least theoretically. I am not arguing against this. But the ways groups are identified as minorities and their protection
formalized, while the majority is rendered elusive, at best, draws more attention to people(s) identified as minorities and away from the majority that enacts cruel oppressions. In other words within discursive formations, those in majority are rendered invisible yet able to act in powerful ways, while those in minority more identifiable and impotent. *Minorities* become an easy target, revealed through discourse, while *majorities* are camouflaged.

**The minority**

Another turn for *minority* occurred in the late 20th Century, particularly in the United States of America. *Minority* moves from describing an identifiable subgroup to identifying individual members of the subgroup. For example:

- *There are also other factors operating against discrimination:...direct campaigns of some local civic groups to encourage the hiring of minorities especially in white-collar jobs* (1951).

- *A white employer's taste for discrimination may lead him to hire Negroes, females, and other identifiable minorities only at a rate sufficiently below the going rate for white workers to offset the price he places upon his taste for discrimination* (1965).

- *He was worried about the need for new young blood in Government, for more women and minorities* (1976).

- *During the past year, UNM hired six minorities and 21 women* (1985).

- *Twice as many whites as minorities owned [computers] (1996).*

The embedding of *minorities* deep within the sentence structure continues, and the mathematical, proportional meaning for a subgroup of people in relation to a larger group is dropped. Thus, the only plausible meaning for *minorities* becomes *inferior individuals*. In the second example above, this discursive inferiority is reified with inferior pay.

*Minorities* is used as a term for individuals; as though it is parallel to employees, Negroes, females, women, and whites. *Minority*, originally a singular term used to describe a group or a collective, is now applied to embodied individuals. It is as if the word *minority* has been given the same properties as the word *sheep*—to designate both the individual and the collective without modification. Indeed, the more common use in the contemporary U.S. lexicon is as a term for individuals. Interestingly, these examples portray people in social minority statuses moving into the professional realm—from a group outside the “mainstream” into a stream of the mainstream. It is as if public discourse was unable to account for an individual (from a group) moving into such positions.

**Minority?**

I am arguing that *minority* and *minorities* are currently used as synonyms for *inferior individuals*. If I replace this phrase for *minorities* in sample sentences from above they become uncomfortable and brutal:

- *...UNM hired six inferior individuals and 21 women.*

- *...employers hire identifiable inferior individuals only at a rate below the going rate....*

Schools with larger populations of students considered *minorities* are subjected to less funding, fewer resources, limited curricula. Their academic environments are *inferior* to those of students who are not identified as *minorities*. This designation holds even when those identified as *minorities* move into the majority within a population or school; the term *minority* stays firmly attached. For example, when a subpopulation experiences significant growth and becomes the largest group, individual members maintain their minority status. Instead of growing out of their *minority* or transitioning into the *majority*, the group receives a new designation—*majority minority*. This phrase has become commonly used. Oxymoronically, schools populations are described as *99 percent minority*. Even when a subgroup becomes the majority, we discursively reify the status of its members as *inferior*—they remain *minorities*. We do not use the term *majority* in a similar oxymoronic way—*1 percent majority* school. I suppose to do so might make it clear that our schools are becoming segregated and unequal, again. Speaking in defense of her husband, Don Imus, Deirdre described children attending their summer camp—50% are minorities; 10% are African-American (p. 29). The only way such statements are not oxymoronic is if the notion of *minority* as a mathematical relationship has been relinquished for *inferior*.
Could we truly believe that some persons are inferior? Could our willingness to inscribe certain people(s), repeatedly, with a term that carries this meaning—minority—encourage oppression? I think so. Over the past year, I have been proposing that we find alternatives to the word minority. I have been surprised by the resistance I received to what I thought was a simple suggestion to reflect on our language: People looked perplexed, and some stated,

“That would require too many words.”

“It’s too complicated.”

“But, why would you say it another way.”

“You can’t get people to change their language.”

I now offer this analysis to demonstrate that current use is an option (harmful one); not the only possibility. When people are turned into dormant inferior objects in our daily language, we make discrimination effortless. I hope the continued misuse of minorities in the construction of inferiority and superiority will now seem inappropriate by the majority who read this article. I, therefore, propose ways to interrupt the use of minority as way make people(s) inferior:

1. Become conscious of the use of minority in daily language.
2. Avoid making people inferior (minorities) with words and actions.
3. Begin to re-use minority as a term by describing a relative status—in the minority.
4. Explain who comprises the majority whenever people in the minority are identified.
5. Make persons subjects, grammatically speaking, in written and spoken sentences.
6. Use active, not passive, voice when writing and talking about people(s) in minority positions.
7. Become thoughtful students of re-conceptualizing minority.
8. Become gentle, yet persistent teachers who interrupt misuses of minority.
10. Use more words (instead of the singular word, minorities) to accomplish the above.

References
Performance-based mathematics tasks: A meaningful curriculum for urban learners
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Introduction
For almost two decades there has been a movement within the mathematics education community to implement standards-based/ performance-based instruction in all mathematics classrooms (National Council of Teachers of Mathematics, 2000). While this movement has been in existence, the need for research addressing the challenges of and pathways to implementing standards-based instruction—especially in urban classrooms—is crucial. Lack of performance-based instruction that is culturally relevant has marginalized urban learners’ capacity to effectively engage in learning activities that require significant cognitive effort (Martin, 2000). Consistently, literature addressing urban education states urban learners look for challenging situations that connects to real-world contexts. They want to see the “big picture” and how the curriculum will relate to future endeavors. Teaching for conceptual understanding provides a means of increasing the learners’ critical thinking skills, connects concepts to real-world contexts, and creates a learning environment that shows the continuity of mathematics instead of discrete segments (Gay, 2002; Howard, 2003). Thus, this research study was designed to examine urban secondary mathematics teachers’ understanding of performance-based mathematical tasks. The research questions for this study are: how do teachers of urban learners define performance-based tasks and how do their definitions manifest into their design of tasks?

Background
After a thorough examination of its mathematics curriculum, the Georgia Department of Education found the Georgia Quality Core Curriculum (QCC) to lack rigour, be inadequate and not meet nation’s standards for mathematics teaching and learning. Therefore, Georgia designed and implemented a performance-based curriculum in mathematics. Across the United States, specifically within Georgia, teachers are being asked to make a paradigm shift in the content they are presenting in their mathematics classrooms, their way of delivering instruction, the way in which they engage and provide feedback to students, and the depth to which to teach the materials.

The Georgia performance standards for mathematics have been designed to achieve a balance among concepts, skills, and problem solving. The curriculum stresses rigorous concept development, presents realistic and relevant tasks, and keeps a strong emphasis on computational skills. At all grades, the curriculum encourages students to reason mathematically, to evaluate mathematical arguments both formally and informally, to use the language of mathematics to communicate ideas and information precisely, and to make connections among mathematical topics and to other disciplines (Georgia Department of Education, 2006).

In teaching Georgia QCC for high school mathematics, teachers teach courses that are content specific: Algebra I, Geometry, Algebra II, Statistics, Advanced Algebra and Trigonometry. With the implementation of the Georgia Performance Standards (GPS), teachers will teach integrated courses. Each of these courses will contain content strands from Algebra, Geometry, Trigonometry, Numbers and Operations, Measurement, and Probability and Data Analysis. This will stretch the content knowledge of these teachers and their understandings of the connections between the content strands. Teachers will also need to be skilled in applying various pedagogical methods to facilitate deep conceptual understanding from their students. According to Shuman (1987), Hill and Ball (2005), teachers must have command of the subject matter. Thorough understandings of the mathematics will enable teachers to be flexible in addressing students’ needs and connect the material to real-world situations. Through appropriate pedagogical content knowledge, a specialized pedagogical practice specific to teaching content, and proficient knowledge of the mathematics needed to teach, teachers will be able to impact students in a profound way (Ball, 2000; Shuman, 1986).

The implementation of this [GSP] curriculum will require that mathematics classrooms at every grade be student-focused rather than teacher-focused. Working individually or collaboratively, students should be actively engaged in inquiry and discovery related to real phenomena. Knowledge and procedural skills should be developed in this context. Multiple representations of mathematics, alternative approaches to problem solving, and the appropriate use of technology are all fundamental to achieving the specified goals of the curriculum (Georgia Department of Education, 2006).
With respect to our focus on the impact of mathematics teaching and learning on the performance and achievement of urban learners, we became proactive in implementation of the GPS in urban classrooms. Our response was in the design and delivery of a professional development project. Thus, this study is situated within a professional development project designed to engage secondary mathematics teachers of urban learners in amelioration of their pedagogical choices and practices within in a curriculum designed to enhance students’ critical thinking and problem solving skills and to foster in-depth and rich learning of the content necessary for classroom implementation of the GPS. First we began with a discussion of performance-based tasks. Then we describe the frameworks that we applied in the design and delivery of the professional development of teachers of urban learners.

**Tasks versus performance-based tasks**
Tasks serve as a context for student learning (Doyle, 1988; Stein, Smith, Henningsen, & Silver, 2000). Simply putting students in groups does not create opportunities for student learning, nor by giving them a calculator or manipulatives; instead, the level and kind of thinking students encounter determines what they will learn (NCTM, 2000). Thus, the appropriate task must be selected to accomplish the intended learning goal. According to Doyle (1988) a task calls attention to four aspects of class work: an end product to be achieved; the set of conditions and resource available to accomplish the task; the operations involved in assembling and using resources to generate the product; and the importance of the task in the overall work system of the class (p. 169).

A task can be divided into levels based on the cognitive processes required to accomplish it. The cognitive level of an academic task refers to the cognitive processes students are required to use in accomplishing the task; higher cognitive processes involve comprehension, interpretation, flexible application of knowledge and skills, and assembly of information from several different sources (Doyle, 1988; Stein et al., 2000). According to Doyle (1988) academic work can be divided into two broad categories: familiar work (routine operations and algorithms) and novel work (problem solving, making decisions, assembly). Familiar work has predictable outcomes and creates minimal demand for students to interpret situations and make decisions. Furthermore, there is little risk of things going wrong; novel work has unpredictable outcomes, a high risk of being incorrect, and requires students to make decisions about what to produce and how to produce it (Doyle, 1998).

Similarly, the Mathematical Task Framework as presented by Stein, et. al (2000) works within the two levels defined by Doyle, adding additional task categories; lower level tasks consist of two type, memorization and procedures without connection, while the two higher level task categories are procedures with connections and doing mathematics. These types of task are generally defined in the same context as Doyle’s familiar work and novel work. The type of task underpins the depth of learning and drives assessment. The nature of mathematical processes, concepts, and relationships require deeper understanding and thus higher-level tasks (Stein et al., 2000). A performance-based task is an enriched activity that has multiple pathways to a solution, and it requires the students to demonstrate their mastery of multiple integrated standards (Glatthorn, 1999). According to Suzuki and Harnisch (1995), performance tasks should embody five criteria. These criteria include (a) replicating real-world events, (b) having various pathways to reach a solution, (c) demonstrating the continuity of mathematics instead of discrete segments, (d) providing a space for students to communicate understanding of the concepts, and (e) having a rubric for clear explanation of expectations. These guidelines can help teachers create tasks that are high in cognitive demand, thus challenging and meaningful for students.

**Frameworks**
Stein, et al’s (2000) Mathematical Tasks Framework, Wiggins and McTighe’s (1998) Backwards Design framework, and Gay's (2002), Howard’s (2001; 2003) and Ladson-Billings’ (1995) principles of culturally relevant pedagogy provide the foundation for this study. The Mathematical Tasks Framework provides an adaptable approach for teachers to use in examining how tasks unfold during classroom instruction. In the framework, tasks are seen as moving through three phases. Tasks first are found as they appear in curricular materials or as created by teachers; in the second phase tasks are then set up by the classroom teacher; in the final phase, tasks are carried out or worked by students. Each phase of the framework is critical in influencing what students actually learn. The Backwards Design framework begins with the end in mind centering on the idea that the design process begins by identifying the desired results and then “work backwards” to develop instruction rather than the traditional approach which is to define what topics need to be covered. The model has three main stages: (1) identify desired outcomes and results, (2) determine what constitutes acceptable evidence of competency in the outcomes and results (assessment), and (3) plan instructional strategies and learning
experiences that bring students to these competency levels. For example, Glatthorn (1999) states that in developing performance tasks “you first develop the performance task and then use the performance task to design the unit, teach the unit, and then conduct a performance assessment to determine if the student could perform the task” (pp 67 –68). According to Wiggins and McTighe (1998), the standard has to be “unpacked” in order to determine the assessments. Unpacking a standard involves developing essential questions to guide instruction, and determining if the standard will be needed for future mathematical endeavors, thus called enduring understandings. Lastly in unpacking a standard, the instructor determines the knowledge and skills students need in order to be able to successfully master the content. Once the standard is unpacked, the assessments and performance tasks are developed. Finally, the daily instructional plans are created.

With the assistance of the Mathematical Task framework and the Backwards Design framework, students are asked to think critically about mathematics concepts and make connections between the content strands of number operations, algebra, geometry, probability, and data analysis. In making the curriculum meaningful to urban learners, culturally relevant pedagogy was incorporated into these two frameworks. Culturally relevant pedagogy integrates real-world scenarios with academic content by providing situations that connect to the learners’ environment; it challenges learners to solve non-routine problems situated in the students’ culture (Gay, 2002; Howard, 2001, 2003). Ladson-Billings (1992) posits culturally-relevant pedagogy is “committed to collective, not merely individual, empowerment” that rests on three propositions: (1) “Students must experience academic success.” (2) “Students must develop and/or maintain cultural competence,” and (3) “Students must develop a critical consciousness through which they challenge the status quo of the current social order (p.160).

Method
The participants of this study were 30 secondary mathematics teachers who were selected by their respective principals to participate in a summer institute. During the weeklong intensive workshop, the participants were immersed in activities to strengthen their knowledge of performance-based mathematical instruction. Also the teachers were introduced to the Backwards Design framework and the Mathematical Task Framework. While engaged in the workshop, the participants reflected on their teaching practices, as well, as their personal meaning of tasks.

Data collection methods included a survey, constructed tasks, and written cases. The survey provided baseline data on the participants’ knowledge of performance-based tasks. Constructed tasks refer to the process of tasks creation, analysis, and revision. Written cases consist of the reflection on the implementation of the task in the participants’ classroom. Five participants completed all three phases of data collection. Therefore, these five participants were followed through the analysis process.

Analysis
Each of the five participants was considered as a separate case for analysis. In the results section we provide the reader with the participant’s initial definition of a task. The reader is also given a brief description of the implemented task, the participant’s classification of the level of cognitive demand, how the level of cognitive demand was maintained or diminished during task implementation. 

Angie

What is a task?
“The class activity that helps students to master the objective.”

The task:
The task used by Angie was one created by M. B. Ulmer (1999).
Given the question, “What is the largest number of pieces you can get from a sandwich with X cuts of a cleaver?” Students will be given a worksheet that has pictures of sandwiches to make X cuts. They will fill out a chart that is provided on the worksheet and then use this information to test which function family best models the data. Students will then explain and verify their choices.

In her definition of a task, Angie describes characteristics of the type of pedagogical strategies required for teaching Georgia’s QCC. She remains focused on mastering objectives as opposed to students meeting standards. Her task shows understanding of non-routine problem solving, but lacks context for urban learners. Therefore, after engagement in this initial phase of professional development, Angie’s description of tasks and her designed task remain consistent with the approaches to teaching and learning mathematics under the QCC.
Kyle
What is a task?
“A task is something to do, quite literally. It requires an active participation from those performing the task.”
The task:
You have been working in acting for several years and now your payday had come. You are about to be signed by a big production studio and are promised a third tier contract. The studio gives you three options from which to choose. The first gives you a handsome signing bonus of $1,000,000.00 and $150,000.00 per film. On the second plan, you would get $250,000 per film but a signing bonus of only $100,000. The first two options promises you 3 films a year for 4 years. The third plan offers neither a signing bonus nor per-film pay, but will pay you one-half of one percent of all the profits from each film. You will have to research the studio’s track record of profits from their films over the last 5 years. Make your decision based on the data.

Kyle’s definition of a task indicates his understanding of a performance-based curriculum in that students actually “do something” through active participation. However, upon examination of his task, Kyle does not engage students in a culturally relevant task with respect to Ladson-Billings components of culturally relevant pedagogy.

Debra
What is a task?
“A task is an activity based on performance objectives which indicates the understanding of the desired outcome.”
The task:
Each pair of students was given four problems that dealt with logarithmic functions. The problems were taken from the text and ranged in difficulty level and type. Some problems required changing an expression from exponential to logarithmic form (and vice versa); some required the students to use laws of logarithms to simplify expressions and solve equations; and some were applications of logarithmic functions. Each pair was given four different types of problems. After about 20 minutes, students were to present their problems to the class. They were to provide explanation as to how each problem was solved and were to be prepared to answer any questions that were posed. The only prerequisite was for them to read and take notes in the section. There were no direction instructions.

It appears that Debra has grasped the importance of open-ended tasks in performance-based instruction. While the task created by Debra does not address culturally relevant pedagogy, her task is embedded in an advance level of mathematics.

Catherine
What is a task?
“Open ending, standards-based assignments. Usually hands-on, real-world application/problem.”
The task:
Cameras, telescopes, and surveying equipment all have tripods as stands. A tripod has 3 legs. The length of the legs can be adjusted. Do you think three legged stands are better than four legged stands? Why or Why not?

Catherine’s definition of a task and her task as designed are incongruent. Her task does not address any aspects of performance-based teaching. It is not clear what she expects to students to do mathematically in order to approach the problem. Rather than being open-ended the task is not clear.

Cevia
What is a task?
“A detailed objective stating what you would like the students to learn/obtain from the lesson/unit?”
The task:
Solving a three variable equation – Choose two equations and eliminate a variable. Choose two more equations and eliminate the same variable. Using the two new equations from steps one and two, eliminate another variable and solve for the last variable. After solving for a variable, substitute the value back into equations one or two from steps one or two and solve for the remaining variable in that equation. By this step, you should know the values of two of the three variables. Substitute the values of the two variables into your original equations and solve for the last variable. Write the answer as an ordered triple.
Cevia’s example of a task is direct instruction for solving equations. It is apparent that Cevia has not developed knowledge of mathematics teaching and learning from a performance-based perspective. While Cevia’s definition of a task and her task are consistent, they are not within the realm of the components of performance-based instruction.

**Results**
Each of the five participants was able to provide an alignment of their personal definition of a performance task with their design of a task. After participating in this initial professional development, evidence of understanding some aspects of performance-based tasks were found in tasks designed by Angie, Kyle, and Catherine. The participants’ ability to design tasks that meet the criteria of standards-based instruction serves as an approach to engage urban learners in mathematical tasks was minimal. Most of the tasks created did not have a connection to culturally relevant instruction. Culturally relevant instruction poses questions that stimulate critical reflections on the mathematics in connection with the students’ environment. The tasks were connected to real-world phenomena, but not specially occurrences that students could relate to in their current situations nor connect to their culturally upbringing. Thus this study shows teacher engagement in professional development designed to foster instructional practices for performance-based instruction will require an extended period of professional development beyond a one-year long period.

**References**

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