

# NEW TEACHERS' IDEAS ON PROFESSIONAL DEVELOPMENT

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*It is a challenge for teacher educators to constantly evaluate and reflect on the studies they are organizing for future teachers. The aim of this paper is to find out whether newly graduated teachers find that an emphasis on learning communities in mathematics teacher education has been useful during their studies and now in their work as teachers. We also want to know what further support they would wish for in their professional development. Five teachers, who are working in compulsory schools and graduated in 2010-11 with 80 ECTS specialization in mathematics, were interviewed. Our conclusion is that the collaborative practices in their studies were important for them both during the studies and now when they are all team teaching and collaborating with colleagues. All five teachers work in schools where no other teacher has the same degree of specialization in mathematics and are given leading roles in their schools. They feel they need support from others outside the school and seek varied possibilities to develop professionally outside their school. This is a challenge for those responsible for teacher education.*

Keywords: learning communities, professional development, teacher education

## INTRODUCTION

Mathematics teacher education in Iceland has been changing and developing during the last decades. From 1971 teacher education for teachers in compulsory school (grades 1-10) has been a three year B. Ed. degree. The structure has varied but teacher students have always specialized in one or two subjects. From 2007 -2011 the B. Ed. degree consisted of 80 ECTS in pedagogy and didactics, 80 ECTS in specialization and 20 ECTS in studies of their own choice. From July 2011 teachers have to have a masters degree in order to qualify as teachers.

The authors of this paper have taught different mathematics education courses for more than 20 years and have taken part in developing the studies in cooperation with colleagues. We have chosen to introduce our students to various ways of collaborating and building learning communities during their studies. They have been introduced to lesson study (Lewis, 2002), they prepare their teaching practice in groups, they discuss course readings in groups and write reflective diaries together, prepare for oral exams in groups and work on various other group assignments (Gunnarsdóttir & Pálsdóttir, 2010; Gunnarsdóttir & Pálsdóttir, 2011). This is based on the belief that the creation of learning communities in teacher education gives the students good learning opportunities for developing a professional language and a collaboration competency. Our aim is also to introduce professional learning strategies to our students they can use when they enter the teaching profession.

In the spring 2010 and 2011 approximately 24 students graduated with a B. Ed degree and 80 ECTS specialization in mathematics and mathematics education. We found it

interesting to find out whether students from this group found the emphasis on learning communities in their mathematics teacher education useful during their studies and now when they have entered the teaching profession. We also wanted to know what further support they felt they would like to get in their professional development.

## **PROFESSIONAL DEVELOPMENT AND LEARNING COMMUNITIES**

According to the OECD –Teaching and Learning International Survey (TALIS) 22,4 % of teachers in lower secondary school in ICELAND took no part in professional development activities during the last 18 months and 48,5% took part in activities that lasted for less the 11 days. When asked what prevented them from more participation 47,2% of those who give a special reason said that there was nothing on offer that suited them (Ólafsson & Björnsson, 2009).

A study on the formal professional development possibilities given to lower secondary school teachers in Iceland during the period of 2005-2010 shows that the opportunities given are limited and do not meet features that characterize effective professional development (Desimone, 2009). That applies specially to duration and coherence which are considered very important features along with, focus on content, active learning and collective participation. The organization and funding of professional development in Iceland does not seem to allow for continuation and progression (Gunnarsdóttir, submitted).

Teachers have many opportunities for professional development both within formal professional development settings such as courses and in-service days and informal settings such as common planning and discussion of lessons, self reflection and reading of professional journals (Borko, 2004; Desimone, 2009; Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009). Several researchers have tried to point out some principles for effective professional development by synthesizing results from various research and development projects (Borko, 2004; Desimone, 2009; Loucks-Horsley, Stiles, Mundry, Hewson, & Love, 2010; Wei, et al., 2009)

Wei et al. (2009) define effective professional development as development that leads to improved knowledge and instruction by the teachers and improved student learning. They draw on research from both the US and elsewhere that links student learning to teacher development. Darling- Hammond, Wei and their colleagues put forward four main principles for designing professional development:

- Professional development should be intensive, ongoing, and connected to practice.
- Professional development should focus on student learning and address the teaching of specific curriculum content.
- Professional development should align with school improvement priorities and goals.
- Professional development should build strong working relationships among teachers. (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009)

They also indicate that other factors like school-based coaching and mentoring and induction programs for new teachers are important and likely to increase the effectiveness of teachers. They also point out that intensive professional development rooted in practice is most likely to change teaching practices and lead to increased student learning.

Loucks-Horsley and her colleagues have for more than a decade worked on professional development and in the third edition of their book *Designing Professional Development for Teachers of Science and Mathematics* published in 2010 they review new developments in the knowledge base for professional development and use it to enrich the basic principles of effective professional development they presented in their earlier work.

According to Loucks-Horsley et al. (2010) effective professional development is designed to address students learning goals and needs. It is driven by images of effective classroom learning and teaching and gives teachers opportunities to develop both their content and pedagogical content knowledge and inquire into their practice. It is research based and implies active learning for teachers in learning communities with their colleagues and other experts. It is a lifelong process, linked to other parts of the school system and should be continuously under evaluation.

Professional learning communities seem to play an important role in supporting teachers in continuously improving their teaching and sustaining their professional learning (Fernandez, 2002; Loucks-Horsley, et al., 2010). Lesson study is referred to as an example of a professional development strategy that has many of the aspects that characterize effective professional development. Lesson study enhances teachers' knowledge and quality teaching, it develops leadership capacity and the building of professional learning communities (Loucks-Horsley, et al., 2010).

According to Desimone (2009) there is a consensus among researchers on the main critical features of professional development that can be linked with changes in teachers practice and knowledge and to some degree in student learning. She points out five main features. These are focus on content, active learning, coherence, duration and collective participation. According to Desimone there is strong evidence that focus on content and how students learn that content in professional development can be linked to teacher development and to some extent to student learning. Active learning where teachers engage in various activities like observations, reviewing of student work and discussions is also an important feature. Teachers also need to feel there is coherence between their beliefs and knowledge and their experiences in professional development and between reforms and policies at all levels. Collective participation and duration are also very important features. Teachers need time to work with, reflect on and try out new ideas and they need to do this in a learning community with others dealing with the same issues. The critical features Desimone points out seem to capture the core in principles for effective professional development both Darling- Hammond et al. (2009) and Loucks-Horsley et al. (2010) present.

They also have much in common with what Borko, Koellner, Jacobs & Seago (2011) claim to be the shared view of many teacher educators on professional development. According to this view professional development for teachers should be a collective endeavour, it should be about the work of teaching and the learning opportunities should be situated within the teachers practice.

## **METHOD AND DATA**

In this study we interview five teachers from the group that graduated as mathematics teachers in 2010 and 2011 from the University of Iceland, School of Education. They were chosen from the group we knew were teaching in compulsory schools which is less than half of the whole group. They were chosen because we knew how to reach them and they were willing to participate with short notice.

The interviews were semi structured interviews (Bryman, 2004). Both researchers conducted the first three interviews but in the last two only one researcher was present. The themes discussed in the interviews were experiences especially regarding lesson study and learning communities in the interviewees' pre service education and their ideas on how to develop professionally now when they are professionals. All interviews were recorded, transcribed and analyzed. We read and coded the interviews and from the codes some themes emerged (Flick, 2006). Linking professional development to practice, opportunities for collaboration with other teachers, and better opportunities for professional development are themes that are evident in the data. In writing up the cases we summarize what the teachers said in relation to these themes. We looked at each teacher as a case and tried to capture more in-depth information about their conceptions of learning communities and their actual situation now.

### **The case of Eva**

Eva finished her teacher education in 2010 and has since been teaching in a primary school. She remembers taking part in planning teaching in cooperation with fellow students which now she considers a useful experience and a good preparation for the team teaching in her school. She thinks that in teacher education it is necessary for students both to learn to work alone and in collaboration with others. She learnt a lot from her teaching practice when a practice teacher gave her critical comments on her teaching and discussed it with her.

In her school Eva has the role of a math leader as she is the only teacher who has mathematics as a specialization. She has been giving courses her own school and in working to the same ideology.

I have given lectures within our schools about mathematics teaching and the use of teaching materials. We do not use textbooks for the children only as support to us and teachers ask what do we do when you don't have a book ... what do you if a child cannot do subtraction?

She finds it important that teachers can have discussions and get support in their school. They should have easy access to information about new ideas and materials on mathematics. At the same time they should also have opportunity to attend courses. She has participated in some short courses which she found very useful for her professional development.

I don't think it matters if I take courses inside my school or outside, but in-service days where you learn something new, where something new is happening and just give a course, for those who wish to attend.

Eva expresses the view that teachers have to extend their knowledge and be prepared to search for new knowledge otherwise they will not be able to develop their teaching.

### **The case of Freyja**

Freyja finished her studies in 2011. From her teacher education she remembers the lesson study process as a time of cooperation and discussions. She found it rewarding to share ideas and knowledge when preparing and planning a lesson together with others and having to come to an agreement at the end of that process. She also found it most rewarding to observe a fellow teacher student teach the lesson

...and how because we are two different persons doing the same thing, it turns out different even though we have the same plan, then there are always some aspects that change, both the class and the teacher. I also find it just interesting to come and sit down and see how another class reacts to the presentation and how the teacher is...

Collaborative planning and teaching during teaching practice Freyja considers a good preparation for the job as a teacher. She feels that she has learnt that the teacher's personality, the group of students and the situation are all important factors in teaching and that it is impossible to plan teaching exactly the same way everywhere. She also finds teachers' collaboration very important and vital for students' wellbeing.

We need to decide what to do, also cooperation with other teachers in the school is important. For example in the upper grades where we are working together, because I am only teaching two subjects and then there are other teachers teaching and we are teaching the same students.

Freyja has been trying out many of the ideas she got during her studies but she still has many questions and is looking for new experiences.

...and I left the studies here with a lot of questions. Even though I felt I had learnt a lot there were many questions I would like to get answers to, so maybe it is just the interest of the individual, whether there is an interest to continue educating yourself, keep nurturing what you have been doing or I don't know.

Freyja is seeking knowledge and advice when she meets new challenges both from colleagues and her former teacher educators. She finds it difficult to meet the

different needs of students and wants to get new ideas to cope more effectively and to change emphasis in her teaching towards more hands-on projects. She thinks it is important to have professional development activities like short courses/workshops within and outside the school and be able to have access to the instructors later for questions and discussions.

Freyja finds it important that mathematics teachers have a variety of opportunities for support and professional development and to her the possibilities lie in teamwork at her school and in courses for mathematics teachers.

### **The case of Helga**

Helga finished her teacher education in 2010 and has been teaching both children in grade 3 and students in grades 8-10. She remembers clearly the lesson study process:

...I remember that we prepared the teaching all together, decided on the goals and planned a lesson from A-Z with the reactions to, that if this happens, try to find the ifs too. Look, then we went out and taught it and then the others observed and one taught and then we summarized and could go back home and work on that and try to improve the lesson, fix the goals, or as we did it then I remember that we divided the tasks, we had some group work, then there was one that observed the teacher while the other observed the students. So yes this is what I remember most from that.

Helga says that through the lesson study process she learnt to think more about the structure of a lesson and that the discussions were deeper and more open because the group discussing was jointly responsible for the planning of the lesson.

I found that we thought much more about the structure of the lesson than when we were planning other lessons and then this process afterwards and we taught twice, ... I found that made our reflections deeper, because we reflected twice.... you get more things to discuss because everyone was more aware of their role in the lesson... because most of the time we were three in the lesson even though we had taken on different roles and so, then we talked about it afterwards, it was still different, you could criticize the lesson without criticizing the one who taught, because we were working on it together.

When asked about the courses in mathematics education she attended during her studies she mentions the experience from lesson study and the work on reflective diaries on readings in groups as valuable tasks.

Helga has taken part in a professional development activity concerning literacy instruction. It was a process of two years where all the teachers at the school formed a learning community and met regularly both within the school, with teachers from other schools and the course-leaders. She is interested in trying out a similar program in mathematics or to participate in a lesson study with teachers from other schools. She is the only mathematics teacher in grades 8-10 and would find it challenging to plan with other mathematics teachers even though she works in a team in her school with teachers of other subjects and feels she can discuss her ideas about mathematics teaching with them. She finds it important for teachers in small schools to have the

opportunity to meet other teachers and finds meetings with mathematics teachers in other schools in her area important. Such meetings are organized by the school authorities a couple of times each school year.

...it gives you another point of view, and ideas and support and of course the people you are with in school, you have talked to them and they have the same kind of thought and then you need someone else to get out of that...

Helga has just started a course in mathematics teaching for teachers in her school community that will run the whole school-year.

But I also find it very good to have the possibility of, like this course in mathematics where you start with a course and then you can continue just to get some support so you do not forget the ideas when you are back out there.

Helga finds it challenging to try something new and feels she needs support to teach more in the way she would like to teach. She remembers an international math conference she attended during her studies and found that very interesting. She is also considering further studies.

### **The case of Lára**

Lára graduated in 2010 and has been teaching in a school in the eastern part of Iceland. She remembers doing a lot of group-work in her studies. She found it useful to share ideas and have discussions as a teacher student and experiences it also as a teacher.

I found it useful to hear from others what ideas they had and I hope they got some ideas from me

She feels that in her school teachers share ideas, tell each other about good experiences, collaborate and help each other out.

I like it a lot and I feel that here in my school people work together and it is very easy to ask someone and everyone gives you advice and tells you what has worked well before.

Lára means that her students are the driving force in her professional development.

Just how different students are and that things somehow are never the same, no lesson, no group or just students, they change from year to year and even from one month to another

She feels that because of how different students can be and how many unexpected things can happen in teaching she is always challenged to develop her teaching. She believes that with more experience she will become more competent as a teacher

She is the only teacher in her school that has specialized in mathematics. That means that she has a leading role and chooses teaching materials for the school. She feels that it is a big responsibility and finds it hard to have to argue for her decisions for teachers, parents and school authorities. Now she would like to have support from outside, from teachers from other schools and some specialists through meetings and

courses. In her studies Lára wishes that there had been more emphasis on mathematics teaching for young children and teaching materials for all grades.

Lára claims that she needs more opportunities to meet and discuss with other mathematics teachers. She has good support in her school but not in developing her mathematics teaching and she needs support to work on and develop her own views and opinions.

### **The case of Margrét**

Margrét finished her studies in 2010 and has been teaching in two different schools. She mentions books and articles that she read during her studies and how she can use ideas from them to guide her in her teaching. She is now using some of these resources for building up her competence in using questions in teaching.

Margrét thinks that lesson study rests on interesting ideas that could be useful for her and she finds it helpful to share the classroom with another teacher and to be able to discuss at the end of the day the teaching experience.

I think that it can be good to use lesson study. ... I think we get some of the good things from it in team teaching, especially if you are honest and critical in the discussion when evaluating the teaching.

What Margrét misses from her teacher education is more knowledge about students with special needs and feels that she needs more tools and concrete learning materials to meet their needs. She would like to have an opportunity to join a course or get support to increase her knowledge on that matter.

In Margrét's school the teachers are organized in teams. She feels that it gives her flexibility and support in her professional development. She also mentions that the workload can be spread because the teachers trust each other. Margrét tells that she is working in a new school where the teachers are developing new practices and are curious and inspired to develop their teaching.

.. and in this school, I don't know if it is because it is a new school, very different from the old school where I taught the first year, ...everyone is so ready and willing to develop professionally.

Margrét feels that she is in an environment where many things are happening that will help her in her professional development and that she still has many issues and ideas from her teacher education to work on and develop further.

### **DISCUSSION**

In the interviews all the teachers show interest in their own professional development and have some ideas about their needs and possibilities. What they mention as important factors for them is in line with what Darling-Hammond and her colleagues (2009) put forward as four main principles for professional development. They see their professional development as closely linked to their practice and are striving to meet the needs of their students. They want to form some working relationships with

teachers both in and outside their schools. Because of their specialization they all have leading roles in mathematics in their schools and feel that they need outside support to develop and meet the challenges of being math leaders. As young teachers they feel that collaboration and team teaching gives them the support they need to meet the daily challenges of teaching. Experiences from the collaborative practices in teacher education prepared them for this part of the work but the in-depth discussions about mathematical content and practices are missing. Opportunities for participating in learning communities with teachers from other schools as for example in lesson study could meet these needs as Loucks-Horsley et. al., (2010) point out.

The fact that these new teacher are all given leading roles in their schools shows that they meet some expectations from the school environment and some support from their school principals. This also reflects that schools need professional leaders with good specialized knowledge and what these new teachers they bring with them to the schools is valued an in line with the schools goals for development and improvement That should be a good basis for their professional development and it is an important principle for effective professional development as Darling –Hammond et. al. (2009) draw attention to.

All the teachers are aware of the need for further professional development. They mention courses, in-service days, conferences and meetings with other mathematics teachers as a support for their development. Professional development activities within the schools do not meet their needs to develop as mathematics teachers and mathematics leaders in their school. These both apply to teachers in schools in the Capital area and in the country side. From the interviews it is evident that the teachers would like to have had opportunities to attend courses, workshops and other professional development activities. Because of the size of the population it is difficult to fulfil their wishes and it is important to seek new ways to create a forum for teachers to meet in reality or in virtual space. This is a challenge for us as teacher educators.

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