Educational technology in teaching: What do teachers perceive they need in order to develop their professional competence?

Lena Pareto, Sara Willermark
1 University West, Department of Economy and IT, Sweden
461 86 Trollhättan,
{Lena.Pareto, Sara.Willermark, LINCS}@hv.se

Abstract. This paper addresses the challenge of how to reach an Information and Communication Technology (ICT) competent teaching faculty in the Swedish compulsory school. Continuing professional development (CPD) can be a means to reach ICT-competence among teachers. In order to achieve successful CPD it is important to understand what teachers’ perceive they need in their professional development, which is examined in this paper. The study was performed in order to get a better understanding of the challenges associated with achieving ICT-competence. 17 teachers have been interviewed to investigate how they perceive needs regarding professional development and how they want these needs to be met. The interviews were recorded, transcribed, and analyzed by learning theories suitable for professional practices. Teachers’ expressed needs were interpreted as well aligned with CPD methods advocated in research literature, but less aligned with previous CPD initiatives. Their expressed needs were highly divergent, depending on individual competence, motivation and learning preferences. Previous ICT initiatives may therefore have been too uniform to be effective.

Keywords: teacher learning, teacher professional development, Swedish schools, defense, resistance, proximal zone of motivation, cognitive disequilibrium.

1. Introduction
Despite its relative short history, the development towards digitization in the Western society has been explosive and extensive. This development has substantial consequences for individuals as well as society in general. Technology provides a range of opportunities as they are becoming more important and integrated in peoples everyday life [1]. The European Union currently supports a giant investigation of information and communication (ICT) usage in European schools, the "Innovative Technology for an Engaging Classroom" [2] and the Swedish National School Board performs a corresponding study [3]. During 2006, the European Parliament listed a
number of key competences which were considered necessary to achieve personal
development and active citizenship as well as social inclusion and employment.

Societies, organizations and personal lives have been deeply affected by ICT. Since ICT is becoming an increasingly important player, new opportunities are created for communication, relationships and work. In this context, the school as a social institution has a central role in preparing pupils for this digital living. ICT has in many ways found its way into Swedish compulsory school. Already the former national school curricula of 1994 state that implementing ICT in Swedish schools is a democratic issue: a right for all students irrespective of gender, class, ethnicity and geographical location to become familiar with ICT in school. In the latest curriculum, digital competence has been even more highlighted and emphasized, and digital competence has been acknowledged as one of the major competency areas for schools to develop for all students alongside with reading, writing, counting and democratic competence [4]. Other reasons for introducing ICT in the Swedish schools relates to preparation for working life, improving learning, change involving school development and the internationalization of education [5]. Hence, in today’s society ICT is considered both necessary and a means to improve learning. The ambition from politicians as well as school boards is apparent: a generally implemented ICT-competent school environment for all students.

However, recent reports claim that ICT investments in Swedish schools at that time were low, unequal and that only one percentage of the teachers at K-6 level use ICT daily to support teaching [6]. Today, the investments in schools concern availability and increase in computer density as well as implementation of various types of artifacts such as interactive whiteboards, surf tablets and learning platforms. Access to technology is a prerequisite, but does not necessarily imply usage; the individual teacher’s attitude, digital competence and preferences highly determine the frequency of technology-aided teaching [7] [8]. Neither do ICT equipment in the classrooms per se create new teaching practices. Many teachers, as well as many pedagogical ICT-applications, use the new medium in a substitutive manner by “reinforcing old ways of teaching and learning” [9] [10].

The quality of teaching, i.e. the teacher’s ability to provide effective teaching, is the most important factor affecting students’ learning [11][12] [13] [14]. There are numerous success stories of ICT-based innovative teaching experiments reported in research literature, for example significant learning gains in writing skills [15], mathematical understanding [16], and digital competence [17].

The advocated method to approach ICT-competence development among the teaching staff is to provide continuing professional development (CPD) where ICT-usage is integrated as a natural ingredient in the didactic process [18][12] [14]. Research has shown that continuous support, social networks, consulting and CPD activities that are well integrated in daily work are important for school development initiatives to succeed [19].

However, these novel teaching experiments are often run by researchers or by early technology-adopters among teachers. For a general uptake of technologies and methods in teaching and learning, the focus needs to be on the mainstream majority of teachers and the support they require [20], and for this group we have not yet seen the desired change take place. Hence, the democratic vision of a general ICT implementation in all schools, by all teachers, in all subjects, is not yet reached.
To address this problem, the overall research question is as follows: How can a sustainable subject-based ICT-competence (e.g. ICT-competence adjusted after the subject) be reached for all teachers in order to achieve generally ICT-competent schools in Sweden? As a first step towards this broader question, we have started to investigate teachers’ own perception of what they need to develop further in their teaching practice and how these needs can be met.

2. Related Research

It is claimed that the benefits of ICT-based teaching lies in transforming learning to new forms and redefining the nature of teaching. Here, we will use the term subject-based ICT-competence to refer to such ability to adjust ones teaching to the subject as well as the technological development in order to best support the students’ learning of skills and abilities crucial to the subject [13]. Note, that such competence does not mean to simply add ICT to the same manner one has always been teaching, it means understanding the potential of new technology and from there explore how crucial skills and competences of the particular subject might be acquired more effectively by these means:

“Developing digital literacy in subjects of the curriculum is not about being fashionable or simply about trying to engage students in learning. It is about addressing the changing nature of subject knowledge and acknowledging that students will need different kinds of skills, knowledge and understanding in order to develop their expertise in subjects” [13]

For instance, the expectations from society on language use has changed: students ought not only to read and write, they are also expected to evaluate, compare, analyze and comment on texts, or handle sound and image-enhanced texts [21]. In digital writing, skills of cumulative writing, reflection and revision are emphasized [22], and the process becomes more iterative, visible and authentic due to the unlimited online audience [23] [24][25]. To avoid shallow constructivism, i.e., the lack of understanding of what is learned and why [26], instruction requires thoughtful planning to gain positive results [25] [27].

However, it requires a lot: motivation, time, imagination, effort and sometimes courage to relearn and alter ones professional behavior, so it is not surprising that the enthusiasm and competence of using ICT for novel teaching vary greatly among teachers. There are also concerns whether such novel teaching methods are congruent with the required knowledge in standardized tests [28]; [29], which are the benchmark schools performances are measured by. In our approach we acknowledge that the teacher profession is constantly imposed by reformation concerning new curricula, new technology and changing expectations from politicians, school managers, parents and their students to “teach for the future”, so the profession’s willingness and ability to adopt is often at stake.
3. Theoretical Concepts

The advocated method to approach ICT-competence development among the teaching staff is to provide CPD where ICT-usage is integrated as a natural ingredient in the didactic process [12] [14] [18]. In research literature it is emphasized that collegial collaboration, continuity, classroom observations, involvement of outside expertise as well as reflection and experimentation are success factors in competence development [11] [30] [31] [20]. However, teachers’ current views, attitudes and values concerning teaching must be challenged in order to develop new ideas and ideals [32], [12], since transformative learning will not occur unless such critical questions are posed [33].

Research has shown that continuous support, social networks, consulting and CPD activities that are well integrated in daily work are important for school development initiatives to succeed [19]. Management commitment plays a role to pursue a sustainable change, by explaining and creating the posed challenges meaningful to the teachers. Initially, this means to make teachers aware of their learning needs and thereby motivated to engage in a change process. Thereafter, the management’s challenge is to support teachers to maintain their engagement by providing opportunity to affect their situation so that the required changes will not be perceived as overwhelming and discouraging, but rather as feasible and stimulating [19] [34].

Short, time-limited initiatives such as single development days or occasional courses do not normally result in sustainable, valuable effects [19]. Professional learning communities, on the contrary, have the power to pursue improvements and changes that lasts. Professional learning communities is based on the ideas that school development should start from the teachers’ experiences by reflecting on their practices together with colleagues who share these experiences. By active engagement in Professional learning communities, teachers are expected to develop their professional practice and improve students’ learning [35].

Illeris [36] however criticizes researchers and others active in the educational field for too narrowly focusing on what happens when learning occurs. Illeris states that it is just as important to examine what happens when the intended learning does not occur. To understand why learning is not taking place, one can thus turn attention to the barriers that may exist. The concepts of resistance and defense are suggested as models of explanation. Defense concerns the driving force, or rather lack of driving force for learning. Defense prevents learning through unconscious psychological mechanisms. The defense mechanism intends to protect the individual from learning that can disturb the mental balance, why learning can be a difficult process. Illeris [36] reasoning is similar to Piaget’s ideas on Cognitive disequilibrium [37]. Piaget describes a state of cognitive imbalance when encountering information that requires us to develop new or modify existing knowledge. Disequilibrium is often an uncomfortable state for individuals, thus we seek to quickly return to a state of equilibrium, either by ignoring the new or modifying our previous knowledge. Engaging in such modification requires mental energy, and may be experienced as anything from a stimulating curiosity to a transformative burden. Defense is thus about rejecting learning and is possibly the most important psychological factor explaining why learning fails or why it differs from what was intended. Furthermore, Illeris [36] states that both security and strong motivation is required to overcome...
defense, since defense significantly contributes to maintaining self-esteem and identity. It can be difficult to distinguish defense from resistance, and, in some situations they act simultaneously. But while defense is something that has been built up over a longer period of time, resistance becomes mobilized in contexts where the individual faces situations that he or she can not or will not accept. It may involve a general context or be linked to specific situations. Resistance is generally more conscious while defense occurs automatically.

Illeris [36] consider adults learning to be partly different from children’s, since adult’s identity has been formed over time and simultaneously developed a defense against learning that can threaten identity. Also, adults tend to learn what they want to learn and that they find meaningful, and are reluctant to learn what they can’t see the use for. Often there is ambivalence between wanting and not wanting to engage in a learning process – something that seems to be increasingly more common with the increasing social demands on learning and development. Requirements or expectations that are perceived as overwhelming tend to block learning.

Inspired by a well-known idea of Vygotskij, the proximal zone of development, there is a corresponding model regarding the value aspect of motivation [38]. The model suggests that there is a proximal motivational zone in which a learner is able to value or appreciate new knowledge, i.e. a zone in which the learner is ready to be motivated but needs assistance to learn to value the new activity or domain. Ideally, a learner identifies with an activity or domain, just as she identifies with a style of music or a hobby. Identification can explain why some individuals value certain learning domains while others do not.

There are some major challenges in this research area concerning 1) how competence development should be organized to ensure sustained competence levels when the profession already experiences heavy time constraints [39] and are challenged by quick technological changes [13], and 2) how to organize competence development to motivate the entire teaching staff to change their teaching practices enough to involve ICT effectively for the benefits of all students’ learning.

4. Research Approach

In order to get a better understanding of what teachers perceive they need in order to develop their professional competence, an interpretative approach was chosen. Interpretative studies aim to understand phenomena through the meanings people assign them [40]. Interpretive research has emerged as a valid and important approach to information systems research. Furthermore interpretative studies can be a significant asset within the IS research in terms of understanding the context within which information systems operate [40]. In particular, when the aim is to find out and better understand how specific individuals experience use of IS, qualitative interviews is considered as a suitable method for data collection [41].

4.1 Project Background

The study of this paper is a starting point of a PhD project with the overall aim to examine how to reach an ICT-competent teaching faculty in the Swedish compulsory
The intended approach is to develop, study and evaluate the impact of different methods of CPD over a longer period of time. In order to pursue CPD relevant to the teaching faculty we started our investigation in order to gain better understanding of teachers' working situation and their views of professional development.

The importance of studying teachers' working situation and their view of the professional development was sprung out of (and is now a part of) a current national program on developing mathematics in schools. The Swedish National School Board finances this project, which runs over a two-year period. The project is conducted as collaboration between researchers and practitioners, and involves about 60 teachers and 1000 pupils from a municipality in West Sweden. The project was designed with regard to earlier research on how CPD should be designed to be successful: using action-based research by the means of learning studies which is considered to be critical dimensions of the professional development of teachers e.g. [42] [43] including collegial collaboration, continuity, classroom, observations as well as reflection and experimentation in the actual teaching action. Hence, the project implemented all the described above ingredients known to be successful in competence development. Yet, we experienced that even our dedicated, highly skilful and interested teachers had problems to engage to the extent they wanted in the CPD activities. It became increasingly clear how complex and versatile teachers' working situation was and also how challenging it could be for teachers to fully engage in provided CPD activities. Asking us why, we decided to further investigate what teachers themselves perceive they need in their professional development.

Thus the focus of this paper is to further investigate what teachers perceive they need in order to develop in their competence. This in order to gain knowledge of how CPD should be designed to appeal to teachers, both in content and form, and explore the possibilities as well as the obstacles.

4.2 Method
The chosen method of investigation was individual interviews, since we were interested in each respondent’s perception of their own situation, and their personal view of their professional practice. The interviews were organized in 4 themes, each theme with an explicit purpose and a set of open-ended questions for the interviewer to choose from, all with the intention to get the respondents in a narrative mind frame to describe and give examples based on their own experiences. The narration-based inquiry approach was intended to not only describe factual situations but also uncover the respondent’s judgments and personal values of the topics of interest.

The respondents were recruited from participants in the on-going CPD project, due to easy access and since the participants could thereby register the interview time within the project. The recruitment base was both current participants and those who, for different reasons, no longer were participating. The inquiry was not intended as an evaluation of the on-going CPD project, on the contrary we did not want the teachers to be constrained by their relation to us as collaborating partners, so we tried to be very explicit about our intentions. Also, the interviewer was new and less connected to the project.

The study included 17 interviews with teachers working in the Swedish compulsory school, all from the same municipality but from several different schools and areas of
socio-economic environments. Thus the interviews were based on an open conversation in dialogue with the respondents. This is in line with. In the interview situation the interviewer first introduced the purpose of the study and the following conversation was concentrated around the following predetermined themes:

1. Background questions designed to explore respondents' views of their professional role. Why did the respondents become teachers? What do they perceive as key aspects of their professional role and what is their pedagogical approach. What makes them grow as teachers? Purposely we asked this last question prior to getting into discussions of competence development, since we did not want respondents to be constrained by their idea of more formal and organized forms of professional development.

2. The respondents work situation. What does everyday working life consist of and how is the workload? Who has expectations on their professional performance? What assignments are included in their profession?

3. Continuing professional development: what are the respondents' visions and experiences? How should CPD be designed to appeal to them? Do they want CPD and do they have the option to choose?

The overall aim of the questions was to obtain and understand teachers perceived needs in order to develop their professional competences, this by getting an in-depth understanding of the respondents’ situations: What are their incentives? Do they feel the need and the urge to learn more, to develop their professional practice? If so, what do they need in terms of external support, activities and circumstances?

The interviews were conducted at the respondent’s respective workplace and lasted between 40 to 90 minutes. They were recorded and afterwards transcribed. Two researchers extracted excerpts that were judged to be of interest to our research question from the transcripts independently, and compared the results. These excerpts were analyzed according to the interview themes, but also arranged and rearranged into evolving categories while interpreting the data. Issues of interest as well as the categorization of topics evolved during the analysis. Analyzing our data, two main categories occurred which were considered particularly relevant to our research question:

1. What teachers felt made them progress in their professional practice and
2. Their experiences related to CPD-activities.

5. Results

From the transcribed interviews, 213 text segments were perceived to relate to the questions of interest, and extracted. The excerpts were categorized as a result of our coding process and divided into two main topics, that corresponded to questions about

1) practice progression and personal growth and
2) experiences related to CPD activities.

The respondents were divided in three groups reflecting the length of their teaching experience: short (1-5 years), medium (6-14 years) and long (15 and more years). There were 4, 5, and 8 respondents in the respective groups.
To get an overview of the distribution of respondent’s responses, the evolved categories and the number of excerpts within each category is shown for both main topics in the table below:

**Table 1.**

<table>
<thead>
<tr>
<th>1) What makes you progress in your professional practice/grow as teacher?</th>
<th>2) Experiences related to CPD activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content</strong></td>
<td>Conceptual</td>
</tr>
<tr>
<td>specific knowledge</td>
<td>6</td>
</tr>
<tr>
<td>didactic approaches</td>
<td>5</td>
</tr>
<tr>
<td><strong>Form</strong></td>
<td>Experiences and opinions of CPD</td>
</tr>
<tr>
<td>own reflective practice</td>
<td>10</td>
</tr>
<tr>
<td>collaborative practice</td>
<td>10</td>
</tr>
<tr>
<td>justification of practice</td>
<td>11</td>
</tr>
<tr>
<td>formal education</td>
<td>1</td>
</tr>
<tr>
<td><strong>Organizational issues</strong></td>
<td>Insights</td>
</tr>
<tr>
<td>more time</td>
<td>13</td>
</tr>
<tr>
<td>shared responsibility</td>
<td>5</td>
</tr>
<tr>
<td>resource utilization</td>
<td>9</td>
</tr>
<tr>
<td><strong>All</strong></td>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

**5.1 Progress in professional practice**

The first topic was divided into three categories: content, form and organizational issues.

**5.1.2 Content**

Regarding content, the specific knowledge the respondents discussed concerned ICT (3), research results, mathematic methods and swim practice. Two respondents expressed a reluctant attitude towards ICT, as illustrated by: “Personally I don’t think it is very important… my 2nd graders don’t need to know the computers”. In the didactic approaches the respondents revealed teaching dedication; the excerpts concerned the perceived deficiency to make all children reaching all goals in the curriculum, as illustrated by: “to find, to find methods … for pupils with special needs”.

**5.1.3 Form**
Most excerpts concerned the format in which teachers develop their practice: by own reflective practice, collaborative practice, justifications by others or by organized courses. Own reflective practice mainly illustrated their reflection-in-action: how they deliberately tried out new approaches, new ideas, new ways of handling difficult situations, and intended reading about research: as illustrated by: “Sometimes I feel, oops this was not good at all… then one must reflect on what went wrong ” and “All the time I get new perspective of things, and I try, yes I try new things… All the time.”

The value of collaborative practices are in all excerpts in this category, such as: “I think one learns much more by collaboration, I don’t think I learn as well when I only have me and my class and my subjects ”, or “when I sit with my colleagues – how do you do it? – I did like this – I did as you did, but that didn’t work at all – No, but in my group it worked excellent – what is the difference between these groups?”

In the next category, justification of practice, we have found two different kinds of justifications: validation of the teaching by the pupils as illustrated by “when you can see how a candle is lit when you talk about different things ” and by verification by a trusted authority or colleagues: “when you go to a good lecture… and you feel yes, I do that right ” or “she pointed at several things which actually worked really well. She asked why I did this and that. It made me grow, yes… I felt I knew more than I thought ” [referring to a learning study collaborative reflection session]. Only one respondent pointed out a course as a source of professional progression.

Interestingly enough, only 1 of 32 excerpts originated from the inexperienced group, 10 from the middle group and 21 from the experienced group. The experienced teachers had very clear ideas of how they develop their own competence, indicating many years of a reflective approach to their practice.

5.1.4 Organizational issues

Regarding organizational issues, 13 out of 17 respondents argued that time limitations is an issue; they feel there is not enough time to plan and perform their ordinary teaching appropriately, even less to improve their practices and learn anything new. Four respondents wanted to share the responsibility for their class with a colleague, and work more in pairs in the classrooms. The resource utilization category concerned how to organize substitute teachers, the documentation load, and to provide enough ICT equipment.

5.2 Experiences related to CPD activities

The second topic was divided into four categories: conceptual, experiences and opinions of CPD, insights and perceived influence.

5.2.1 Conceptual

Regarding the conceptual category, the respondents were asked to define CPD. 11 of the respondents gave their subjective definition on CPD. Five of these respondents gave a rather broad definition, illustrated by: “Something that makes me develop as a teacher ” and “I guess that's when you learn something different ... than what you already know” while four respondents referred to the content such as: “that you learn a subject better”. Two respondents referred to the design of CPD as illustrated by: “after all I still think of it as taking a course?” and “it is the different educations that you have.”
In seven cases, the respondents didn’t give a subjective definition on CPD but expressed other aspects instead. One of these statements was positive towards CPD while the other six were more critical. Two respondents said that they developed through collaboration, planning and discussing with colleagues, but that “it does not count as professional development”. One respondent expressed that “I do not feel any great need of it” and another said, “If there is something you want it is time, not professional development”.

5.2.2 Experiences and opinions of CPD

The next category, experiences and opinions about CPD, was divided into three subcategories: about organization, about form and about content. Respondent’s expressed criticism linked to CPD activities taking place without proper planning. According to one respondent there are problems related to staff being absent from work to attend a course or lecture. Replacement staff, or the lack of them, causes stress among teachers as well as pupils as illustrated by: It has to be exceptionally good professional development if it is going to pay off for what has been lost in a couple of days where nothing substantial work has been done. So it, it is a dilemma” Furthermore, the concept where some leave work in order to participate in CPD is also questioned for other reasons. There are deficiencies in terms of spreading knowledge to other colleagues as illustrated by; “Some attends these and some attends that. But it never comes to the attention of others, and then I don’t think that we can call it professional development”. There are 53 statements categorized as “form”. The respondents gave several examples of potential forms of CPD, such as: workshops, study visits, job shadowing, learning studies as well as pedagogical and thematic conversation. Lectures and courses were given as examples of activities that could provide inspiration and make one reflect on one’s own actions such as: “a good lecture can make me reflect, a good lecture can matter a lot”. However, in seven cases the respondents stressed the importance of being able to apply recently developed skills into practice. In order to avoid a gap between theory and practise respondents requested hands on’ examples that they immediately could adopt in their work, as illustrated by: “and then you have to put this into practice and...I don’t always got the time” and “a lot is good but somehow you can’t use it.” One respondent specifically asked for interaction between CPD and work, where new knowledge is tested in real-life situations and afterwards discussed and evaluated. The respondents requested time to process experiences related to CPD as well as CPD organized to allow greater continuity and an opportunity to work with issues for a longer period of time. Peer interaction such as: discussion, collaborative planning and teaching were highlighted as positive form of CPD as illustrated by; “we know different things and then we learn from each other” and “there are actually a lot of knowledge between these walls”. On the other hand, unsuccessful examples of collaboration were also given, such as educational discussions without clear goals or meetings where a constructive dialogue was absent. In the next category the respondents gave examples of related to their CPD s such as implementation of the new school reform and ICT activities.

5.2.3 Insights

Next category “insight” aims to identify the consequences of CPD activities and
contains 18 statements in which 15 are critical and respondents express uncertainty of whether CPD is a good use of resources. The criticism partly regards lack of outcome or utility of CPD. The respondents lack obvious or visible effects and they experience difficulties implementing what they have experienced into practice, as illustrated by: “and then you’re back the next day, doing the same thing in the same way and I am not so sure that this is a good use of recourses,” and “then it sounds really good but then two weeks passes... and then is has disappeared” and “I don’t think that I develop much when I attend to courses like these, I have been to way too many courses”. A critical approach towards CPD can also be linked to these activities taking place at the expense of other work-related activities. Respondents express that too much is “going on” which is stated by: “It feels like you could have a fulltime-job doing all of these other things, but then, you should still devote six hours on the kids every day”, “All the time its something new, before you’ve had the time to establish it in... in oneself,” and “teachers are very tired of everyone who attends to courses all the time. And it is the same thing with our principal who goes to courses all the time. That we miss our principal.

5.2.4 Perceived influence
Regarding perceived influence the decision-making process was partly questioned and activities lack support among the teachers: ”Well, it is a whole lot that the principal has decided”. Respondents highlighted the importance of actually being involved in the decision-making process regarding CPD: “So you have to decide for yourself what professional development you need. I know what shortcomings I have as a person”. Two respondents stated that they lacked the determination or energy to be involved, as illustrated by: “I could probably be more involved if I had any time and energy left for it” Eight respondents said that they, together with the principal made decisions about CPD activities. This may involve influence to influence the content, choose between alternative activities or making requests, for example selecting from various options or making requests about the future, such as “you can come up with suggest yourself, but then it is still the principal who makes the decision”.

The last category “can you decline CPD” includes eight statements. Seven of these conveyed an ambivalent response as illustrated by: ”Yes I think that I would be able to do that if I, but I think that you probably won’t” and “You can, can’t you? Yet it would feel unwise.” and “...yes I guess that you probably can. Well of you got a reason.” One of the respondents, however, clearly stated that he had no desire to say no: “I don’t want to say no...it is probably hard to manage without it. Because the reality changes all the time, new things show up, I mean this with computers which have expanded more and more and this new program that’s coming”.

6. Analysis
The respondents were clear about what they need to progress in their professional actions: they need time to teach, time to reflect on their teaching and they need to collaborate and discuss in particular locally rooted, didactic matters with their peer colleagues. From time to time they need to be inspired, but if there is no opportunity
to deploy the new ideas in practice shortly after, there will be no effect. The teachers expressed needs are well aligned with CPD methods advocated in research literature, recall from above: collegial collaboration, continuity, classroom observations, reflection and experimentation as success factors in CPD e.g. [11] [30] [31]) [20]. But respondents, also describe when learning does not occur and that they lack visible effects of various CPD-initiatives. From the interviews, however, a clear discrepancy could be distinguished, between what teachers perceived they need in order to develop and their experiences of CPD. When the respondents refer to learning activities they’ve been participating in, these actions are generally of occasional character, as readings or courses that take place in settings separated from school environment. This is consistent with previous research that shows how single development days often have a limited effect [19]. The respondents also stated that CPD often lack continuity, follow-up, local establishment, and that newly acquired insights were considered difficult to put into practice. The gap between expressed needs and actual interventions may involve difficulties in creating professional development.

What is also clear from the interviews was that the teachers are experienced a lot of pressure. New curriculum, more teaching hours and increased demands in documentation leads to a stressful work situation. Teachers described how they could not find time for their primary tasks at the same time, as there was a density of projects and concurrent learning activities. In such situation, not only did the utility of CPD activities become questioned, but also far more serious - in several cases was regarded as something taking place at the expense of ordinary work. I this context it not hard to imaging that teachers mobilize what Illeris term as resistance or defense, since the feeling to be in a situation perceived as overwhelming activate this behaviour. Herein, Piaget’s concept about cognitive equilibrium can help interpreting the teachers learning perceptions. From his view there are mainly two outcomes of such cognitive equilibrium: either by ignoring new information, or by modifying previous knowledge. Choosing the path that involves a modification and transformation may require hard work and mental energy. The learning process might be regarded as a necessity but also associated with discomfort, stress and insecurity. This ambivalence was evident among the interviewed teachers, especially when the teachers reasoned whether they could refuse CPD initiatives or not.

Thus, at the same time as, the respondents emphasized their need to collaborate, discuss and participate in activities with colleagues, the importance of activities based on the individual’s needs are also highlighted. Inferring individual circumstances is seen as a prerequisite for professional development. In order to avoid what Illeris term as barriers of learning, CPD needs to be designed to support teachers in this work as much as possible. This involves that decisions are consolidated amongst the teachers and that learning activities is in line with the individual’s capacity.

It is clear that needs, as well as preferred learning methods, vary among individuals, but also between the different experiences amongst the groups. Learning preferences regarding concrete CPD activities seem to be individually based, whereas their preferences concerning professional growth vary among the groups. The most experienced rely mainly on their own ability to self-reflect to improve their practices but they also express a clear value and desire to collaborate and discuss with their colleagues. Yet they seem more aware of how challenging the teaching practice is.
This may indicate that teachers are open to learning to a larger extent and that they become more secure in their role with experience and thus less likely to prevent learning. On the other hand, the inexperienced respondents did not express much concern of current professional growth; on the contrary they expressed confidence in what they already know and an urge to put their competence into action. Such stance could indicate that this group even further experience the situation as overwhelming, and therefore mobilizes a defense. Defense and resistance can in this context be seen as an entirely necessary process from the perspective of the individual teacher, but hardly desired from the perspective of CPD.

As Illeris [36] states adults are unwilling to learn what they cannot see the use for and when forced to change - their adjustment becomes superficial and activates defense mechanisms. Locating what Brophy [38] refers to as the proximal motivational zone, may consequently prevent learning barriers and be an important step towards successful CPD.

8 Concluding Remarks

To conclude, a clear discrepancy could be distinguished between what teachers perceived they need in order to develop, and their experiences of CPD. Furthermore the respondents experiencing a stressful work situation and requests more time in order to progress in their professional roles including preparing lessons, reflect on their teaching, collaborate and discuss didactic matters with their peer colleagues. Thus the respondents express ambivalence participates in CPD and the utility of these activities is being questioned.

The teaching profession is described as constantly changing and thus lifelong learning includes not only pupils but also teachers. Learning seems to become a requirement rather an opportunity. The teachers may experience the situation as overwhelming and therefore mobilise learning barriers. To avoid resistance and defense from preventing learning, it is important to regard the needs of the individual. Earlier initiatives may have been too uniform to enable learning for individual teachers in particular, as well as to adopt CPD methods in general. From this we can realise that further investigation is needed, taking a more integrated approach to consider such individual as well as organisational issues.

The results contribute to important insights relative to the direction of the further PhD project, regarding how to reach a sustainable subject-based ICT-competence for all teachers, in order to achieve generally ICT-competent schools in Sweden. The importance of meeting the teachers' individual needs is further enhanced in the light of previous research that has shown that teachers’ enthusiasm and competence of using ICT for novel teaching vary greatly.
References


38. Brophy, J. (1999). Toward a model of the value aspects of motivation in
education: Developing appreciation for particular learning domains and activities. Educational Psychologist, 34(2), 75-85


