

Cultivating collective reflection on experiences of teaching with ICT

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Abstract

The question of how to teach digital literacy attracts the attention of researchers, government agencies, parents, mass media, etc. This paper proposes that the teacher's role is crucial: to teach digital literacies, teachers must have developed their own digital literacies. When defining digital literacies broadly, skills-based approaches to teacher training are not enough. Inspiration from 'critical' approaches to reflection adds to our understanding of how to develop digital literacies in schools.

We propose the need for approaches where teachers are supported in jointly reflecting on their experiences of teaching with, and about, information and communication technologies (ICTs). Using the work of educationalist Paulo Freire, we argue the need to see action and reflection as an integrated whole.

We examine a project in which we added a reflective approach to a technology roll-out to 30 schools. While the project differed at each school, a semi-structured process facilitated by *mentors* supported collective reflection in all schools. Although challenges were encountered along the way, the final evaluation indicated that schools had found the approach helpful. This paper argues the need to include approaches which stimulate and make possible collective, critical reflection among teachers.

Introduction

This paper contributes to *facilitating teachers' own understanding of their evolving experiences*. It has two purposes, first, to contribute to debate on the conditions necessary for teachers to become capable of teaching digital literacies; second, to *propose collective reflection as a key dimension* in this endeavour.

Discussions on what digital literacies¹ are, including in the pages of this journal (e.g. Lankshear & Knobel 2006, Buckingham 2006), testify to the complexity of the term. Definitions and accounts of digital literacy have been categorised by, among others, Lankshear & Knobel (2006), who critique key features of mainstream approaches including the reification of the term as an entity which may be possessed and a decontextualised focus on techniques or skills. Buckingham calls for critique to be included and for non-instrumental views of technology use in school: “we need to equip students to understand and to critique these [digital] media: we cannot regard them simply as neutral means of delivering information”(2006, p.78).

Bjarnø, Øgrim, Giæver, & Johannesen (2008) contribute to reconnecting societal perspectives with ICT use and operationalise some of these concerns in their definition of *digital kompetanse* (“digital competence”), a key term in contemporary Norwegian teaching practices with regard to digital literacies: “The ability to use digital tools and have a sufficient understanding of the technology to function in and make a change to society” (2008, p.18, our translation).

When digital literacies are viewed less as a property of the learner and more as a process, the crucial position of the teacher is evident. Teachers are faced with diverse aims, complex influences, and rapidly changing external conditions (Øgrim and Beck 2004), with at times poor matches between expectations and realities (e.g. Grepperud and Haugsbakk 2004). While questions were initially raised about the purposes for which ICTs were introduced (Jamissen and Nyhus 1986), later work has probed deeper. Dominant discourses surrounding computer use interpenetrate the curricular documents (Haugsbakk 2010). National plans (UFD 2000, 2004) currently emphasise the importance of ICTs at all levels of education.

We have previously claimed that, in Norway, teachers have been struggling with multiple layers of often conflicting expectations surrounding ICTs in schools and there is scant support for teachers in negotiating this terrain (Øgrim and Beck 2004). Norwegian governmental agencies have ensured that more skills training is provided to teachers. A major national example of this was the *LærerIKT* programme, in which groups of teachers were tutored by other teachers on the usage of certain applications in teaching, etc. Our evaluation of *LærerIKT* (Alfredsen and Jamissen 2003) reported positive effects for teachers' ICT skills. Yet it also found an absence, even in otherwise “successful” schools, of reflection by participating teachers and school leaders regarding pedagogical and didactic consequences of the use of ICT in teaching and learning, and in organisational aspects. The finding was troubling: how could teachers support young students in developing digital literacies, including critical abilities as called for by Buckingham (above), if they themselves were not reflecting on the consequences of their own increasing use of ICTs?

¹ Following Lankshear & Knobel 2006, we use *digital literacies* in the plural.

A prerequisite for teaching digital literacies beyond skills would be the development of the teachers' own awareness of a range of issues surrounding ICT usage (Beck and Øgrim 2009). A relevant term might be 'capability': "having justified confidence in your ability to take appropriate and effective action to formulate and solve problems in both familiar and unfamiliar settings" (Cairns 2000). Few approaches to developing ICT usage in schools address aspects such as this. Thus, research on digital literacies beyond skills could beneficially develop approaches to supporting teachers in becoming capable at addressing the complexities of teaching of ICT usage and understanding.

The purpose of the paper is to do so. We explore how teachers' collective reflection over their actual experiences may be facilitated and the expectation that such reflection may contribute to greater independence from dominant discourses. In the remainder of the paper, a theory-based argument for the interrelationships of reflection and action is supported by discussion of a development project in which teachers were encouraged to reflect on their evolving experiences with teaching with ICTs.

Reflection and action

Reflection has been researched in teacher education for decades. For the purposes of this paper we understand reflection as, roughly, the monitoring of self in an environment to understand more of the situation and one's contributions to it.

Paulo Freire, education activist and theoretician, argued an intimate relationship between reflection and activism, in which awareness of theories or values that guide one's actions is an important part of understanding and changing one's contribution to the situation. Freire writes about this in his influential *Pedagogy of the Oppressed* (1996 [1970]), pp. 47-48):

"This discovery cannot be purely intellectual but must involve action; nor can it be limited to mere activism, but must include serious reflection

*(...) On the [one hand], reflection – true reflection – leads to action. On the other hand, when the situation calls for action, that action will constitute an authentic praxis only if its consequences become the object of critical reflection."*²

Freire proposes that in developing awareness of and responses to the limits by which one acts, action and reflection are intertwined. They co-constitute; each can be found in the other. If action is called for, reflection is needed too.

More recent applications of Freire's work develop these perspectives. Kemmis (1985) also argues for the integral nature of reflection and action, retaining a social and

² Freire (*ibid*) applies his views of the action-reflection relation to specific ways of struggling for 'liberation' from 'oppression', and can be read as assuming that identifying what each of these terms might entail is straightforward. We do not hold this view. Yet, we find his clear conception of the relations between action and reflection helpful, as well as his insistence on the possibility of change and his early awareness of dynamics of compliance with unfavourable situations.

political motivation by insisting that reflection is political: “it actively reproduces or transforms the ideological practices which are the basis of the social order” (1985, p.149). Michael Reynolds (1998, p.183) makes an explicit distinction between the terms reflection and critical reflection: “The crucial distinction in usage is in terms of the questioning of the contextual taken-for-granted – social, cultural and political – which is the hallmark of critical reflection.” Our contention is that developing the teaching of digital literacies beyond skills and towards critical reflection includes developing a culture for discussing experiences with ICT use. There is therefore a case for approaches which support teachers in collectively reflecting over their experiences.

Various forms and uses of reflection have been advocated by Education researchers, testifying to the popularity of the idea of reflective teacher practice. Ellström (2006) extends Reynolds’ point above to the role of reflection in informal learning at work, stressing the importance of a critical perspective where “*one of the crucial elements of this reflection process is to make explicit, and thereby testable, the often implicit and taken for granted premises of our action*” (p. 48). He further argues that the reflective levels of action refer not only to the performance and consequences of actions but also to reflections concerning the task and the goals.

Thus, while Freire proposed the link between reflection and challenging dominance (i.e., oppressive situations/relations may be changed through reflection-action), the idea of critical reflection has built on Freire and other work to further develop the reflection aspect. Authors writing critically about critical approaches and about uses of reflection include warnings against reified reflection resulting in individualised-only reflection, (Zeichner 1996, Fendler 2003) etc. Some, concerned with Education and teacher training (Zeichner 1996, Fendler 2003; see also Nerland 2006), warn against decontextualised reflection exercises with unclear purposes or weak connections to practice. While the latter is likely to be less of a concern for in-service teacher development, retaining relevance by staying close to teachers’ actual experience, as well as facilitating teachers reflecting together, would nevertheless be a challenge.

Next, we present development work carried out together with a number of schools, in which we created an approach to collective teacher reflection on ICT usage.

Practicing collective reflection on ICTs: project *Pi* – educational integration

This section presents work with schools and teachers to encourage and support reflection on their experiences with increasing ICT use. It exemplifies the following aspects from the discussion above: strengthening the capabilities of teachers and schools to respond to changes from increased use of and attention to ICTs; facilitating action-reflection cycles; and doing so collectively.

Background for the reflection project

The Municipality of Oslo and its education authority had been seeking to increase ICT usage for teaching and learning through financial incentives to schools. For 2002-03,

in addition to providing schools with free participation in *LærerIKT*, the education authority in Oslo launched the *InnsIKT*³ project. Each year, *InnsIKT* was to fund hardware and technical infrastructure in another 20-40 schools. The challenges experienced in implementing ICT-related educational usage, organizational learning and school development highlighted the need for different approaches.

The municipality subsequently partnered with Oslo University College (OUC), through Grete Jamissen, in conducting a comprehensive project to accompany the second round of *InnsIKT* funding. *Pi – Pedagogisk implementering (Educational Implementation)* was to focus on educational and school development issues. Valuing teachers' experience and viewing their digital literacies as broader than the mastering of skills, the project aimed to contribute to the development of participating schools in three areas: i) computer *skills*, as in mastering the technical equipment and computer programs; ii) experience in *pedagogical usage* of tools; iii) *reflection* on consequences for teaching and learning. (Skills development was provided through theme-based courses and is not further discussed in this paper.)

For the involved schools and teachers to set their own agenda was a key feature of the *Pi* design. Schools at all levels, from Primary to Upper Secondary, were invited by the municipality to propose projects and explicit project goals describing their needs for computing equipment and plans for school development. The municipality selected 30 schools, involving potentially a total of 1400 teachers and related staff.

The *Pi* project was explicit about the *School project* being the core towards which parallel and mutually supporting activities, described as “Mentors’ programme” and “Principals’ seminars,” were oriented (see Figure 1).

***FIG 1 here or later. Billedtekst/caption: “Figure 1: Project activities overview, as presented to mentors and schools at the start of the project” ***

In accordance with the literature on reflection discussed above, the *Pi* project provided a structure and methodology for reflection. Support was centred on visits by an external person, a *mentor*. Mentor activities were closely intertwined with the school projects.

Bearing in mind the evaluation of the *LærerIKT* approach (above), the inclusion and commitment of school principals was designed into the *Pi* project as a *Principals’ programme*. This was a series of meetings encompassing both mutual sharing of experiences and exposure to potentially new perspectives on organizational development with ICTs.

Our focus in this paper is on the joint reflection activities between mentors and teachers during the main school project period, i.e. December-September. The following sections present the activities intended to facilitate reflection and our experiences of them followed by discussion of the outcomes.

³ *InnsIKT* translates as *Insight*, with the double meaning “Initiative for ICT”. *LærerIKT* translates as *TeacherICT*, with the double meaning “Richly Instructive.”

Structuring the explicit reflection process – mentors and reflection meetings

Mentors were themselves teachers with substantial experience of teaching using ICTs, many as tutors in the *LærerIKT* programme. They were trained and supported by the *Pi* project management from the OUC (i.e. the authors). Three seminars provided what proved to be welcome meeting points and a learning arena where experiences could be shared and a variety of issues discussed. The first seminar focused on the participants' competencies and expectations related to the mentor role. The second seminar focused on sharing and learning from experience, as well as some training in "practice-based counselling." The third seminar introduced Kolb's model of experience-based learning (1984) and focused on the mentor's own reflection notes. Throughout the project period, mentors had access to Internet- or phone-based guidance (some used the phone when encountering challenges, but hardly any used Internet-based discussions).

The concept of mentor in a setting like this was new to all involved, including the authors, and our understanding of the mentor role deepened as a result of continuous formative evaluation. From the outset, the mentors were conceptualised as a "critical friend" and a support to each school project (Kember et al. 1996). Mentors were described as a *peer* well experienced in the field of ICT and learning, and we emphasised that they were not expected to be an "ICT expert".⁴

Each school and mentor had several meeting points, including an initial planning seminar organised by the *Pi* project, a kick-off seminar at the school and a process of (at least) three reflection meetings between teachers participating in the school's project and the mentor. Each cycle required preparation from all involved in the local project, as well as participation in reflective discussion during a meeting with the school's mentor. The reflection process centred on five questions (below)⁵ addressed in a *reflection memo*. Such memos were to be written by teachers who implemented the school's project in the classroom (or at least based on input from them), and sent to the mentor before each meeting.

- What has been working well or is working well (name 3 things) - and why? (Reasons may beneficially include for whom it is working well.)
- What has not been working satisfactorily, or is not working satisfactorily (name 3) – and why? (Reasons may beneficially include for whom it is not working satisfactorily.)
- What do we intend to do to change what is unsatisfactory?
- How can we make use of what works well as an inspiration to ourselves and/or others?
- What are the consequences of our use of ICT for our pedagogical practice?

⁴ For more on the thinking behind this conceptualisation of mentoring, see Jamissen & Phelps 2006.

⁵ These five were based on three questions suggested by Simon Michelet, OUC. The questions and other material as used during the project are available at <http://home.hio.no/sevu/pi/> (accessed 6th July 2009).

The memos had two purposes: first, to stimulate teachers' discussions and reflection before the meeting about their ongoing activities; second, to provide grounds for discussion at the meeting, to ensure discussion would be based on the specific experiences of those most intimately involved with the (new) ICT related activities. After each meeting the mentor prepared a *response note* to the school, based on the Reflection Memo and the discussion at the meeting. Its purpose was to sum up joint insights in a way that might encourage further development.

Evaluation design and implementation

The *Pi* project was subject to comprehensive evaluation. The municipal educational authorities conducted a self-evaluation program for the schools involved with *InnsIKT2* and an external R&D unit was contracted to conduct a quantitative survey on teacher and student ICT user competence (Jakobsen & Jensen 2005). Schools reported on the outcomes of their own project and evaluated these in relation to the project aims they had set when applying for participation. An open question on the *Pi* project was upon our request included in the survey.

While the data gathered presumably met the municipal authorities' reporting needs, we found the responses to contain little of relevance for processes initiated by us. We therefore conducted an additional, qualitative, evaluation primarily focusing on process and development issues. Six schools were selected for focus group interviews covering three dimensions: ages of pupils, levels of ICT-related activity and degrees of ICT-integration prior to the *Pi* project, and the extent to which the mentor-school collaboration had appeared to be productive. This gave a broad sample of participating schools, representing all three school levels, previously active and less active schools, schools where mentors were welcomed and used, schools perceived as more reluctant or hesitant towards their mentor, and schools perceived as being somewhere between.

Teachers, the project leader, and the principal were invited to each school interview. (The evaluation and recommendations based on it are further detailed in Jamissen 2004.) Our involvement with the evaluation process was thus closer than originally planned—introducing obvious limitations to the independence of the findings. We explicitly invited critical comments on the project. The near unanimity of the enthusiasm toward the end of the project period (including from schools selected due to expressed difficulties along the way with the chosen approach) was not only encouraging but lent increased credibility to the findings. Consistent with this conclusion, mentors reported perceiving more positive outcomes for schools at the end than along the way.⁶

The discussions in the remainder of this paper are based primarily on the group interviews. Secondary sources of insight into others' views of the processes were reports written by the mentors halfway and at the end and their contributions in seminars through the year, evaluation forms from teachers attending the theme-based skills courses and written responses from all 30 schools in the external evaluation.

⁶ To our knowledge, there was no particular incentive for mentors to report in this way, which adds to the indications that schools were positive towards the end.

Evaluation findings

In their self evaluations the 30 schools reported changes such as use of a greater variety of software, a different and more flexible organization of the school days and improved routines for administration and information, including cooperation between teachers and between schools and homes. Traces of a more conscious constructivist approach to teaching supported by ICT could also be read into some responses (Jamissen 2004, p.25). Considerable variation was evident between schools. This could be explained partly by differences in their ambitions and starting points and partly by the processes being conducted differently.

On the other hand, we found substantial agreement on the compulsory reflection activities having made valuable contributions to the progress of the projects. As well as being mentioned in several questionnaire responses, the reflection activities were considered valuable contributions to the progress of their projects by all six schools interviewed.⁷ Other data supported the impression that, after the projects, schools were unanimously agreed on the value of the mentoring.

The interviewed schools reported that the presence of a mentor had helped them to stop and reflect more than they otherwise would have done.

The mentor has, through his inspiration and inputs, ensured that the project has had a solid foundation in the staff. The mentor function has contributed to achieving our goals and it has represented a quality assurance of the progression throughout the school year.
(School report)

Observations and statements support the interpretation that the projects succeeded in increasing the self-confidence of participating teachers. We received reports of increased motivation to engage with computers, greater ranges of activity with computers, and teacher readiness to learn from their own experiences and those of colleagues. Several schools reported not only an increased use by teachers, but also eagerness from some teachers whom school project managers previously “*would not have expected to touch a PC voluntarily,*” as one put it.

Many teachers reported that they developed a sense of mastery over the technology and gained a more differentiated understanding of ICT as a tool. In the beginning it seemed important for many teachers to put a distance between what they conceived as their “real” work (teaching), and the ICT tools imposed upon them (“merely tools”). Towards the end of the project many had developed a sense that these were “*their tools*” and that they were useful and helped make their teaching more varied and interesting for both themselves and their students (Jamissen 2004, p.28). One teacher explained her relationship with her new tool like this: “*We are about to erase the divide we experienced earlier where the students mastered the technical skills and the teachers were only interested in their subjects. Now we, as professionals, also see how we can use these tools for our own ends beyond technology. We have regained control!*” (Jamissen 2004, p.33)

With regard to a different approach to teaching, or new ways of understanding learning and the role of the teacher, the clearest signs were the ways administrative

⁷ The strength of this finding came as something of a surprise to the authors as we had gone to some length to include an equal share of schools that might provide critical views of the mentoring and/or Pi design in the interviews.

and organizational changes had impacted upon assignments and student work. Teachers reported that students showed a tendency to be more responsible for their own learning processes, with the teacher more as an advisor, and that their learning arena was extended to the home and different rooms at school.

Discussion: Facilitating collective reflection

The project design assumed that facilitating teacher reflection on their own experiences of teaching with ICTs might make them more capable and better equipped to develop responses they consider appropriate. The most direct ways in which we sought to facilitate reflection on “educational” issues was through the fifth question: “*What consequences does our use of ICT have for our pedagogical practice?*” Clearly, any answers to this question would have to be partial and tentative. Our purpose was thus not to elicit “correct” answers, but rather display our expectation that teachers would have, or develop, interest in the topic and that the school would devote the necessary resources.

As detailed above, our chief *means* was to provide scaffolding for strengthening teachers’ ‘critical’ awareness of ICT-related issues. This consisted of three aspects, each of which is now discussed: schools and teachers creating their own project and being responsible for following it up; the presence of an external mentor for reflection support; and teachers’ joint reflection.

Schools creating and being responsible for their project

For the schools to *create* the project themselves would, we assumed, make the project more relevant to the daily experiences of the teachers and the school in general. In particular, the terms communicated by the municipality included the expectation that creating the project would involve more than one teacher and the commitment of the school management, including the devoting of resources (teacher time) to the project. Furthermore, the Principal would have to set time aside to attend meetings with other Principals during the project period. In these ways, working on the *application* for funding of the technology provided an opportunity to more generally discuss school priorities with respect to ICTs.

The *InnsIKT2* project was unclear regarding the extent to which schools could decide on their project design. With technical, economic, and other administrative challenges repeatedly turning up during the first months of the project, there were many occurrences of frustration and thus opportunities for learning. A limitation to designing their own development project was that proposals should be compatible with the plans of the municipality.⁸

While expectations were clear from the start that there would be some level of joint commitment, one or two projects never displayed this. Other schools set aside much of the teachers’ mandatory joint development time (“*fellestid*”) for their project, thus involving all teachers. Some did this by announcing “An ICT Year” for staff development, making ICT use an explicit focus for a limited period.

⁸ For details on some of the challenges from an organisational usage of technologies perspective, see E.E. Beck “Steps Toward Massively Distributed Participation” (unpublished ms).

The schools' leeway on how to increase their ICT-usage was thus substantial in some areas. Yet it was heavily curtailed in others, such as the application platform and service provision, and therefore on costs and on using a specific technology, and the expectation to join the *Pi* meetings and classes.

Mentoring as scaffolding for reflection processes

As indicated, the reflection process surrounding the mentor visits was the chief support in *Pi* for teachers to develop reflective perspectives on their experiences. The external interest embodied by mentor visits provided clear expectations that schools and teachers engage in reflection.

A mentor as peer, rather than a wiser senior, represented both possibilities and challenges.⁹ Many project leaders in the participating schools had technical skills that were equal or, in a few cases, superior to their mentor. This initially led to some frustration, but also to the need to explicitly discuss the mentors' role as an outsider to school processes who could pose questions that would encourage the school to reflect on their experiences with ICT. This met with two challenges. The first was how some mentor-school pairings became enthusiastic about the specific skills the mentor could offer to the school, challenging our delimitation of the mentor role. In response and with the agreement of mentors, a small number of hours of mentor time were redirected towards general assistance to the school. Each school-mentor dyad would agree on how best to use these. (Any additional wishes from schools for assistance from their mentor were to be bilateral agreements between school and mentor, formally outside the *Pi* project though intertwined with its implementation.) The second challenge arose directly from the project's focus on developing reflection rather than skills and surfaced in particular when emphasis was placed on the roles of the mentors as process facilitators. While the mentors were confident about their own ICT skills in a teaching context, several reported feeling out of their depth with facilitating reflection and organisational development. Most mentors appeared to us to gain confidence in their roles and in the structure we had provided, although one or two reported never becoming comfortable with this role.

One of our key experiences was the need for clear communication, both about roles and aims and for building legitimacy for a critical approach. For instance, even though the issue was addressed in the introductory seminar, the importance of establishing a relationship between mentor and mentee(s) by which they can negotiate and renegotiate their mutual expectations may not have been fully appreciated. Literature on mentoring (Zachary 2000, Forster 1998, Boud and Walker 1991) stresses the importance of the personal contact and contract between mentor and mentee(s). In *Pi*, school representatives and mentors showed that they perceived the mentor role as unclear. Kember et al. (1996) discuss the use of a mentor as a "critical friend" in a similar setting and, as in *Pi*, they experienced that the role evolved as the project progressed. Their mentors resembled the *Pi* mentors in that they functioned as a "mirror", contributed to the development of teaching plans and helped the teams get

⁹ While the *Pi* mentor was herself a teacher, she was external to the school. This led to challenges related to sufficient knowledge of the culture of the mentee institution. Internal peer mentors might have had the advantage of good knowledge, but may also have been more challenged by the need for distance to everyday activities. For a discussion on how mentoring in *Pi* compares with other mentoring approaches, see Jamissen & Phelps 2006.

on with their reflection assignments. They also helped the teams to focus on results and progress. Our experience is consistent with the conclusion of Kember et al.: “we have come to recognize that the manner in which any of these aspects of the role are conducted depends upon our relationship with the team” (ibid).

We further believe that carefully placing – and keeping – the focus on the specific experiences as they were unfolding may have contributed to reflection being possible – and to a perception that using extra time for reflection was worthwhile. In particular, while we have obtained little evidence of specific aspects which may have contributed, we did notice that initial resistance to the apparently simple design (five straightforward questions, repeatedly asked) never resurfaced. Our guess is that the simplicity and transparency of the structure of the reflection processes may have aided the teachers in “owning” them: the questions were not for use in reports for third parties, but for the teachers’ own use.

While the schools’ perception of success was solid and encouraging, we do not have data on what reflection our involvement established in the longer term. Although schools overwhelmingly reported that the mentor had been “useful,” there were few descriptions of how, or of what was achieved in terms of learning or change. Mentors reported seeing signs of pedagogical reflection, but in the evaluation responses schools themselves showed few expressions of awareness about such reflective processes or events.

On the basis of this one-year project we concluded that mentoring seemed helpful. There was, however, room for improvement in mentor selection, the mentor-school relationship and the specific structure provided for reflection, etc.¹⁰

Critique and collective questioning

Staying close to the experiences of the participants fits with Freire’s action-reflection perspective, as a first step. The schools’ and teachers’ autonomy however, while limited also entailed important differences from the all-out collectivism which may be read into Freire and Critical Pedagogy.

The project was not designed to discuss or challenge power relations. A degree of questioning the premises for actions surfaced, however, in the form of challenges to the approach taken in *Pi*. This also surfaced in the relations between the municipal project funder and the school leaderships.¹¹ Some of Reynolds’ and Kemmis’ key conditions of ‘critical reflection’ (such as commitment to ‘emancipation’) were not addressed in the *Pi* project. Yet some were, such as the commitment to a social perspective, with power relations playing part of the design – though in *Pi* more in an enabling manner than in questioning them (e.g. attention to gathering peers and to involving school leaders). Cross-schools discussion of what the overall purposes of school development with ICTs might be, beyond the particulars of each project, was not initiated and could have provided occasions for exploring the current conditions. While reflection in this project might not satisfy the important criterion of questioning the taken-for-granted premises for the situation as posed for example by Reynolds

¹⁰ These were incorporated into a restructured *pi2* project the following year, but unfortunately *pi2* received neither the follow-up nor evaluations of *Pi*.

¹¹ Cf. note 8.

(above), our contention is that collectively reflecting on evolving experiences can be a necessary first step towards this, in addition to the benefits of the experience itself.

While the project design facilitated reflection as a joint activity, not all school projects were carried out in this way. At gatherings, a contrast was evident, for example between one school where the project appeared to be largely a single-person activity with minimal school support and other schools where the project was a joint activity. Comments from a number of teachers and mentors indicated that the perceived benefits of colleagues working together – even imperfectly – were substantial. Many of the involved ICT-experienced teachers referred to themselves as usually being (in our words) ‘lone enthusiasts’ in their school. This may be one reason why getting together seemed highly welcome, whether within, between or outside the schools. One benefit of meeting and reflecting together was therefore to put the development of technology use in school back into its rightful social context.

Beyond specific improvements, we came across little evidence of substantial weaknesses in the project design. Thus, in our view, its main design weakness was its duration and lack of follow-up. We now consider 6-10 months to be rather short for establishing reflection as a practice. For most participating schools, reflection was not part of their prior conceptions of what this project would entail. On the other hand, we saw many expressions of how processes of reflection had indeed been set in motion in most schools –hesitantly at first, more clearly towards the end.

In summary, the mentoring strand of the *Pi* project had aimed to introduce teacher reflection into one step of a governmental ICT roll-out. Our conclusion is that it, to a large degree, succeeded in doing so. What *kind* of reflection took place, however, is less documented. While at the end of this project we experienced much enthusiasm we found less in the way of questioning the premises for the situation than hoped for. Still, as discussed above, there were indications that the scaffolds succeeded in bringing some participants a few steps towards reflection which broadly speaking might be called ‘critical.’

Conclusions: Critical reflection for digital literacies beyond skills

In many countries there has been an interesting and promising shift of focus for educating teachers in ICT, from a skills-based approach to an approach with a broader understanding of competence as resembling *capability* (cf. Cairns discussed above). As discussed by Phelps et al. (2005), capability includes critical thinking; hence this perspective fits well with the cultivation of joint reflection. Facilitating action and reflection on action may help teachers to individually and collectively see themselves as agents who are both responsible for and able to set agendas for ICT use in classrooms.

Research into digital literacies that go beyond skills can build on existing work within Education and related areas, including within many of the approaches referred to as ‘critical.’ As one example, the *Pi* project points to ways in which some of the benefits of collective reflection might be harnessed to benefit teachers’ ability to teach digital literacies. Responding to the concerns of Fendler and Zeichner (above), *Pi* was not an

exercise but part of the lives of these teachers and schools. It was not marred by any implicit separation between teacher experiences and ‘critique.’ Furthermore, its simple reflection scaffolding is readily re-usable and adaptable.

Notions of digital literacies need to employ active, critical consciousness of many kinds in the service of improving one’s surroundings. For developing digital literacies in the broad sense, emphasis should be on developing reflection for capability and critical awareness. Even the simple act of explicitly placing teachers’ experiences at the centre of efforts to introduce more computer use into schools and asking them to discuss their experiences may challenge some existing ideas about the use of ICTs in schools.

Is collective reflection on teachers’ experiences with ICTs a “luxury”? While in Norway, as in many other countries, significant effort and money is put into equipping schools and enabling teachers to master the basics of teaching using ICTs, research provides no straightforward answers to how to teach with computers or what to aim for. Our contention is that teachers are and in the foreseeable future will continue to be those in the know – about challenges, opportunities, and the changes among the young. Research should at times challenge practice and often – we hope – provide impetus for change. Nevertheless, teachers and students *experience* the situation we talk and write about. In this perspective, various forms of critical reflection by teachers are a necessity to develop the field of digital literacy.

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