# A reality check: Taking authentic e-learning from design to implementation

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**Abstract**: Tampere University of Applied Sciences has developed a postgraduate certificate program for teaching in higher education that is currently being implemented at Higher Colleges of Technology in the United Arab Emirates. In the design of the program, the principles of authentic e-learning (Herrington, Reeves, & Oliver 2010) have been used as a guideline. This paper examines how the design principles have been transferred into practice and how the elements of authentic learning have been realized from the student perspective. The experiences of the students have been mapped in a survey conducted after the first semester of the program. The data was analyzed with the help of the authentic e-learning framework in order to identify the challenges and successes regarding the implementation of the elements of authentic e-learning and thus draw guidelines for future development.

## Introduction

The rapid development of technology, globalization and shift to knowledge economy have changed the work environment  in an unparalleled manner. As Postman and Weingartner pointed out already forty years ago, when the environment changes, a new repertoire of strategies, skills and mindset are required (Postman & Weingartner, 1969). This is ever more true in the 21st century knowledge society. Many writers have identified a set of subject matter independent skills - sometimes referred to as "21st century skills" that are increasingly important for students to acquire (see e.g. Ruohotie 2002; Solomon & Schrum 2007; Trilling & Fadel, 2009). However, Rotherham & Willingham (2010) argue that assessment methods, teacher expertise and lack of support are potential stumbling blocks in the path of educational renewal. Even the introduction of education technology has often led only to surface-level changes in education: the same content, working methods and pedagogy can be applied, only with a different tool (e.g. Herrington et al., 2010; Stiles, 2007).

Previous research at Tampere University of Applied Sciences has yielded encouraging results and promising guidelines for a model of teacher training that supports teaching faculty in adopting a new professional role and identity, as well as in developing skills in innovative use of education technology (see e.g., Teräs & Myllylä, 2011; Myllylä, Mäkelä & Torp, 2009). This model is based on authentic e-learning principles as defined by Herrington at al. (2010), combined with a wide and diverse use of social technologies, and it has been developed and researched in a vocational teacher education context. It has proven to be a fruitful approach for teacher education on several levels. The results include improved collaboration skills, improved use of

advanced education technology, strengthened professional identity and improved reflection, and awareness of one's own learning (Teräs & Myllylä, 2011). These results have formed the basis for a postgraduate certificate program for teaching in higher education (PGCTHE), developed at Tampere University of Applied Sciences and currently being implemented in United Arab Emirates Higher Colleges of Technology. The program is developed to meet the professional development needs of teaching faculty who are experienced in their field of specialization but lack formal pedagogical training. The focus of the program is, as its name suggests, in the skills, knowledge and competencies that teaching faculty need in the 21st century environment, including understanding of megatrends in working life and society, developing education technology and social technologies as well as new approaches to teaching, learning and assessment. A central aim of the program is, as Postman and Weingartner (1969) put it—as they described their idea of "new education"—to help teachers cope effectively with change.

The program was started in September 2011 with 30 teaching faculty participants and 9 online facilitators specially trained for the purpose. The program consists of 3 modules, 10 European credits (ECTS) each. The first module was completed in February 2012. The aim of this paper is to describe how successful the implementation of the authentic e-learning model has been during the first semester of the program, to identify elements that require special attention, and to suggest steps for further development.

## Authentic e-learning design of the program

Design elements of the 21st century educators program focus on providing an authentic online experience for students, supported by faculty from both the awarding university and locally trained facilitators. Based on nine principles of authentic e-learning (Herrington & al., 2010), the program models the pedagogical activity that it seeks to develop in the practice of participants, most of whom had prior learning experiences that were almost wholly based on the lecture knowledge-transfer model of learning. A collaborative progressive inquiry (based on methods introduced by Hakkarainen, Bollström-Huttunen, Pyysalo & Lonka, 1999) is another feature of the program that students experience. The elements of authentic learning and the way these elements have guided the design of the program are explained below (cf. Teräs, Curcher & Leikomaa, 2012):

An *authentic context* is a central and essential starting-point of an authentic learning experience. Without such a realistic context, students often struggle to determine the value and significance of the learning activities they perform. Herrington et al. (2010) warn about oversimplification of complex cases and situations, and encourage educators to embrace the complexity of the real life situation rather than break a learning problem down into small achievable steps. This enables the content and ideas to be studied in a physical or virtual environment that reflects the way the knowledge will eventually be used. This element of authentic learning is instantiated in the PGCTHE program by using the context of the teacher's own classroom, a learning management system (Blackboard Vista) and several social technologies, such as blogs, Google Documents, Google+ and Google Hangout. Because the program is designed for in-service teaching faculty to be taken concurrently with work, immediate implementation of new knowledge in teachers' own classrooms is an essential part of the program and ensures by its very nature, an authentic context for learning. There is also more reason to use open social technologies in addition to an LMS, because it is impossible for the teacher to have full control over the learning process or to make a detailed plan of the types of activities that are going to take place within them. Herrington et al. (2010) point out that the aim should be "to assist the learner in functioning in the environment rather than to simplify it" (Herrington et al., 2010, p.21).

*Authentic tasks* have real-life relevance and are open-ended and complex, just as real-life problems tend to be. Further, authentic tasks require long-term effort rather than the short-term endeavours required by decontextualized exercises that are frequently set in higher education learning environments. The central learning tasks of the program are extensive team projects that rely on the progressive inquiry method introduced by Hakkarainen et al. (1999). Creating one's own working theories and research questions is an elemental phase of knowledge construction, and a genuine process of inquiry is question-driven (Hakkarainen, Lipponen & Järvelä, 2001). Shared expertise and learning from others is an integral part of every progressive inquiry step, where new information is immediately applied in one's own work.

*Access to expert performances and modeling of processes* is another key characteristic of authentic e-learning. While this would traditionally have meant that students would have access to a professional, and the modeling of the professional way of completing complex processes, the wealth of information on the Internet now means that expertise in increasingly distributed. Expert performance does not always involve consummate expertise — it also involves access to other learners with various levels of expertise, as well as the opportunity for sharing narratives about professional practice. The program promotes this goal in several ways. With new knowledge constantly being created and shared through blogs, online discussions and social digital narratives,

there is continuing access to other learners and stories about professional practice. In addition to experience sharing, there is also the chance for observation of each other's performances through videos and related discussion.

An authentic e-learning experience also provides ***multiple roles and perspectives***. This includes the opportunity for students to explore issues from different points of view rather than, for example, a single teacher's view or from a heavy reliance on a single textbook. It also encourages students to use the learning environment and its resources in different ways, and for different purposes, instead of forcing a single unwavering pathway through the course. To promote this in the program, participants work in teams that have been carefully selected to ensure that each team has members from different colleges and departments, representing different ages, different nationalities, different subject matter expertise, and both men and women. The teaching staff of HCT is itself extremely multicultural, which adds yet another enriching aspect to the authentic e-learning process.

Authentic e-learning should include opportunities for the ***collaborative construction of knowledge.*** This means that the tasks should be completed in groups or pairs and the assessment should also provide an incentive for collaboration rather than simple cooperation. The complex learning tasks of the program encourage and require different types of collaboration in different groups. Team projects are completed in teams of 10 participants, but there are also tasks for smaller groups, collaboration between small groups and individual tasks that also require a collaborative element, such as reviewing and commenting on each other's blog posts or participating in an online discussion. Assessment works at both the individual and the group level.

A critical factor in authentic e-learning is attending to participants' own previous experiences and ***reflection***. The process of progressive inquiry requires decision-making at several points, both regarding the research question and the tools used for accomplishing the task, giving ample opportunities for reflection in-action (Schön, 1983). Social technologies offer versatile and effective tools for reflection. Blogging about the observations and experiences gained in applying the new knowledge acquired through the learning tasks enable the participants to compare their experiences, assess their own action and skills, attend to feelings, relate the new skills to their previous experiences, and learn from others as they reflect on-action (Schön, 1983). Reflection plays an important part throughout the program, and learners are encouraged to think of their own teaching from the viewpoint of both teachers and learners.

Another key element of authentic e-learning is ***articulation***. Tasks that promote articulation should require students to speak and write about their growing understanding, defend arguments and articulate ideas. This process is built in the progressive inquiry based team project, where the participants must first come to an agreement on the research question, build common understanding and create new ideas together. Blogging and contributing to discussion forums also offer further opportunities for articulation to enable tacit knowledge to become explicit. As Bielaczyc and Collins (2006) mention, an online discussion offers a space where ideas are visible for everyone and available for discussion and improvement. Thus a social context is formed, where, according to Glaser (1991, in Von Wright, 1992), the thinking processes of the learners are displayed, enabling individual as well as collaborative reflection.

***Scaffolding and coaching*** is an essential feature of authentic e-learning that requires a teacher to sometimes adopt a new and quite different role in the teaching and learning environment. In addition to the main instructor, the program uses local facilitators, specially trained for the task. The facilitators are trained in an intensive course prior to the program's start. The facilitators' tasks include giving feedback on tasks, making sure their group stays on track and in general helping the groups in their studies. Coaching also takes place in all of the group activities in the program as the participants with varying levels of expertise coach each other.

***Authentic assessment*** is another important element of an authentic e-learning environment, where assessment is integrated with the task, rather than comprising a separate standardized test. The assessment in the program is ongoing and portfolio-based, and is seamlessly integrated into the learning process. The assessment consists of group and individual learning tasks and products that are directly related to the participants' own work. A great deal of emphasis is also given to reflection and articulation in the form of blog posts and discussions. A central part of the assessment is formed by a process of progressive inquiry related to the themes of each module.

While it is not always possible to fully and completely comply with all the elements of an authentic e-learning environment given academic and assessment constraints, the PGCTHE course design aligned as closely as possible with the model as described here. In the sections below, research on the learning environment is described in more detail.

## The research study: Research question and methods

At the end of the first semester of the PGCTHE program, the participants and local facilitators were asked to complete a comprehensive survey to provide feedback and so guide future developments and improvements. The survey mapped the participants' experiences in three main areas: 1) learning community; 2) technology and 3) instructional design and facilitation. The questions consisted of both multiple choice and open questions and it provided both quantitative and qualitative data. The survey questionnaire was online. Twenty six of the participants and facilitators fully completed the survey.

This study has three goals: 1) to identify the successes and difficulties associated with each one of the nine elements of authentic learning; 2) to compare the outcomes and the design principles to identify possible gaps and 3) to carefully examine the nature of the problematic areas in order to find guidelines for future development in order to enhance the authentic learning process. Both quantitative and qualitative results are introduced, however, this study puts more emphasis on analyzing the qualitative data as it is more descriptive and provides more insight with regard to the underlying reasons for the challenges and successes. For example, instead of knowing the percentage of participants who found collaborative activities difficult, we were interested in finding out what types of difficulties emerged, what caused them, and, with the help of the entire data, find patterns that explain relations between these difficulties and the issues with other elements (e.g. scaffolding and assessment).

For this study, the answers to the open questions in the survey were categorized and analyzed with the help of the authentic e-learning framework tool. However, the questions were formulated in such a way that they did not directly address any of the nine elements of authentic learning. This approach was chosen for two reasons: firstly, the developers wanted to keep the questions on a practical level to make it easier, less confusing and more motivating for the participants to take the time to complete the survey. Secondly, asking directly about the elements of authentic learning might have affected the answers as it had been explained to the participants earlier that this was what the program wanted to achieve.

All the open answers were first arranged under the nine elements, depending on which element they most reflected thematically. In some cases, the same answer was categorized according to more than one element. For example, an answer such as "At the beginning of the course it must be stressed that the course requires full participation and all deadlines *must* be met so that team members are not let down" can be seen to belong to both "collaborative construction of knowledge" and "scaffolding and coaching". Once all answers had been listed under the elements, the next step was to further divide the answers into challenges or successes. Finally, the data was studied carefully to find leading themes among each element, both challenges and successes, and the answers were further arranged according to the themes.

## Challenges and successes

### *Authentic context*

The challenges associated with authentic context were very few (2), both of them related to participants *struggling with putting the study program into a context relevant for them*. For example, one of the respondents felt that the theories studied were not relevant for his area of specialty. This comment also reveals that the participant in question had had very different expectations for the studies: all the theoretical knowledge in the module was related to teaching and learning in general, not in connection with a given subject matter. Another respondent required some background reading to help get oriented before the beginning of the studies.

The one major theme identified in the positive comments was *the chance to immediately apply the new things in one's own classroom.* These included methods, techniques, ideas and technologies. Many of the participants valued the recognition of their own classrooms as learning environments and seemed to take full advantage of it. This aspect was strongly encouraged in the program and the utilizing of the authentic context was an in-built element of all the learning tasks. This is also a major difference to many academic programs where the immediate and continuous link between theory and practice is often absent.

### *Authentic tasks*

Authentic tasks was one of the elements that caused most difficulties and confusion during the module. The prominent theme identified in the data was that *instructions and purpose of the tasks were not clear*. There were twenty-two open answers that could be classified under this theme. A comparison with the quantitative data indicates that as much as 82% of the respondents felt that the instructions for the learning tasks were not clear enough. This is not a surprising finding, given that the very nature of an authentic task makes it less clear than traditional, more simplified learning tasks. Herrington et al. (2010) suggest that instead of sparing learners from dealing with complexity, the facilitators' task is to help them cope with it. It is important to notice that 82% of the participants who had sought assistance either from facilitators or peers, had had their problem solved.

Moreover, 63% of the respondents had also been able to help someone else at a point of confusion. This indicates that the participants had been able to adopt an active, inquiry-oriented role, even though according to the open answers, many would have preferred a more straightforward approach to instructions. Comments like "it was very confusing", "instructions were not clear" and "I would have wanted to be told exactly what I was expected to do each week" were very common. The challenge for the facilitators and developers of the program is to figure out whether this reaction was caused by a resistance to a different type of learning or an indication of insufficient scaffolding especially at the beginning of the studies.

Another theme for the challenges with authentic tasks was *confusion with technology*. As mentioned earlier, the program introduced the participants to various technologies. Especially at the beginning, this was confusing to the learners who found it difficult to follow the different platforms and use many different tools for the learning tasks. However, as the studies proceeded, problems associated with technology became less and less frequent.

Finally, a third theme identified was *group issues* that brought another challenging aspect to the learning tasks. This area is discussed in more detail in connection with collaborative construction of knowledge.

Authentic tasks were not only challenging and difficult. It is very important to notice that for many participants this was a highly rewarding aspect of the studies. A major theme related to the successes with authentic tasks could be summarized with one sentence: *problem-solving is enjoyable*. For example, one of the respondents pointed out that the confusing elements were "...healthy, as we were encouraged to think creatively and find our own solutions rather than prescribed one way." Several other answers reflected the same idea. Many participants also mentioned that they had been confused at first, but, due to coaching and facilitation, they had been able to work out the way forward with the tasks. This finding suggests that the scaffolding had been successful.

### Access to expert performance and modelling of processes

The third element of authentic learning turned out to be one of the most successful ones in the first module of the program. Only one respondent felt that the program did not encourage this aspect in particular. *Learning from others and access to expertise from outside the program* were especially emphasized in the questionnaire. The job of a teacher is often a very lonely one and amidst the hectic everyday routine, opportunities for collegial support and sharing of experiences can be rare. Working in teams and especially following each other's blogs were perceived as a great advantage. Several comments suggested that aspects like "learning from others' experiences and discussions" and "sharing ideas and methods" were greatly valued in the program.

Although the use of Google+ remained unsystematic in the first module, some participants acquired an active role in this platform that was brand new at the beginning of the studies. The active networkers benefited from easy access to expertise all over the world. However, what was more interesting was to find out that many of the seemingly less active ones had also benefited from the use of Google+. The number of people who mentioned Google+ as their favorite technology for learning in the program was surprising; it far exceeded the number of the learners who posted actively in Google+. Many learners did not appear to do much with the platform, but they appreciated the "various interesting and often highly informative links posted by other users". This was one of the greatest surprises for the developers who had thought hardly anyone actually used the platform. As the use of Google+ was not obligatory or instructed, the demography of the platform was formed in a natural and user-driven way. Nonnecke and Preece (2000) point out that as much as 90% of participants to an online group are the type that are sometimes referred to as "lurkers" - people who follow an online community closely but do not give visible input of their own. In a traditional educational context, including traditional e-learning, this type of behavior is usually not encouraged due to lack of teacher control: it is impossible for the instructor to track the activity of the "lurkers". However, as Nonnecke and Preece (2000) suggest, the life of an online community can be dependent on them - if everyone is posting, who will be reading? They believe that public posting is but one way an online community can benefit from its members. This observation raises an interesting perspective to blending formal and informal learning, as well as to learning with social media in general.

### Multiple perspectives

In a program where the diversity of the participants is great and learning takes place in teams, there should be plenty of opportunities for introducing and sharing multiple perspectives. However, according to the data, there is still room for development. The major challenge with regard to this element is associated with the discussion taking place in blogs: overall, *blog commenting tended to be scarce, remain shallow, or it did not initiate discussion*. Some of the respondents had not received many comments in their blogs, whereas others

regretted that the comments they got were only politely showing that the person had read the post and that they did not lead to any meaningful discussion. Some participants even felt discouraged to write the blog because of the scant attention they received.

Another hindrance to fully benefiting from multiple perspectives was associated with *group dynamics*. Some participants felt that expressing their perspective had led to disagreement, even conflict. Also practical issues, such as not adhering to schedules in posting, made it more difficult to take full advantage of sharing of ideas.

The positive experiences with the fourth element of authentic learning still outweighed the less successful ones. A theme that could be easily identified from the data was *appreciation of diversity*. Participants appreciated the multicultural learning environment, multidisciplinary collaboration, and generally working with people with different backgrounds. One person mentioned that she had enjoyed working with the team, even though they faced a conflict at one point. However, together as a group they had also learned to work their way out of the conflict. Another theme that arises from the data is *collegial support and sharing of ideas*. The participants had felt that working with colleagues had offered them new perspectives and practical ideas to their teaching.

Finally, it is important to note that *having an authentic audience is enjoyable and improves one's work*. Many participants mentioned that the fun aspect about writing the blog was that others read it. Although many would have been happy to see more meaningful discussion and more abundant perspectives in their blogs, they pointed out that they were still happy even for the comments that merely acknowledged that the commenter had visited the blog. One of the participants mentioned that writing the blog was "...useful because it's always interesting to get different perspectives and when you know you are writing to an audience, you think a bit more deeply about how you communicate your ideas". This observation reflects the idea of conversation and play discussed by Xin (2012), that communicating content is not the only purpose of educational dialogue, instead, the true enjoyment in online discussions comes from making moves that prompt other team members to keep them "playing".

### *Collaborative knowledge construction*

One of the key findings in an international virtual benchmarking project by Leppisaari, Herrington, Vainio & Im (2011) was that collaborative construction of knowledge tends to be the most challenging element of authentic e-learning to implement. Not surprisingly, this was also the case in this study. 94% of the respondents reported difficulties with regard to the collaborative team learning activities. There were three main themes that the difficulties fall under.

Firstly, the most common problem associated with collaborative knowledge construction was that *time constraints and not adhering to schedule cause frustration*. In authentic learning, it is important that the collaborative construction of knowledge goes beyond simple cooperation, that completing the tasks requires collaborative action and that assessment also takes place in the group level instead of merely individual level (Herrington et al., 2010). In the PGCTHE program, the team project that formed the key part of assessment required active teamwork and collaboration. As all of the participants were studying alongside their full teaching load, time management became an important issue. It was rather a rule than an exception that some of the team members were running behind schedule and this caused controversy, frustration and even conflicts within the teams as the performance of the entire group was depending on the output of its members. This left the facilitators 'in between a rock and a hard place': on one hand they could relate to the difficulties of the learners to adhere to the schedule and the need for flexibility, and on the other hand they faced demands to be less tolerant for lagging behind schedule. One cannot of course determine if some of the missed deadlines and group work was in fact not only due to a large workload, but also because of procrastination. Elvers, Polzella and Graetz (2003) studied procrastination in online classes and found indications that "procrastinators in the online class tended to perform more poorly, and the poor performance may have led them to be dissatisfied with the course" (p.162). The possible correlation between the performance, attitude and replies to the survey was not studied so we cannot conclude whether this phenomenon also applies in this context. Elvers et al. (2003) suggest that literature may offer several recommendations for reducing academic procrastination in general. One of their suggestions is making the situation more structured. In using authentic e-learning as the framework for the program, it brings up several questions, such as, what is the right balance in online learning environments and how to determine when something is too little or too much structured. It is a part of designer's or instructor's professionality to sense and evaluate the balance, and act accordingly.

Another theme, slightly overlapping with the previous one, was *communication difficulties, group dynamics and conflict*. The majority of the participants had been in contact with their group members approximately either once or twice a month (41%) or even less frequently (24%). This is an alarming finding and

explains many of the aforementioned difficulties. Several participants pointed out that some of their team members had been hard to reach and slow to respond to queries. Moreover, in some teams the expectations and goals of the members were not met; some expectations went unexpressed and the quality of the other members' input was questioned. This combined with primarily written communication resulted in misunderstandings that at points escalated to a conflict. There were, however, huge differences between teams, where most were able to complete the team project together, but 2 of the 9 groups remained dysfunctional and did not manage to work together.

The third identified theme can be seen as the result of the two aforementioned ones: *the formation of a learning community was challenging*. 45% of the respondents mention that the way learning community is intended to support learning in the program has remained unclear to them. Several participants pointed out that there was not enough dialogue, discussion and feedback within the learning community, whereas others went as far as to state that there was no learning community at all. Again, there were significant differences between the teams. However, it is clear that the building of a community is a prerequisite for successful collaborative knowledge construction. Palloff and Pratt (1999) suggest that by paying attention to the development of a learning community, the instructor creates the vehicle through which the learning happens. Sadera, Robertson & Midon (2009) continue that there is a positive relationship between student learning and community (p. 277). Differences in participants' perceptions about the meaning of the learning community (or that some felt there was not community at all) could be explained with how facilitation and scaffolding assisted or did not assist the learning community to emerge (see chapter 4.8). 44.8% of the current participants reported that they had not got enough information about the role and importance of the learning community in the program. In the future, it might be beneficial to study at what level the participants' previous understanding, attitudes and perception about the meaning of a community are, and also how they see themselves as a part of the community. As Barab and Duffy (2012) suggest, "we are still in our infancy with respect to understanding the potential of, and what constitutes, a community" (p. 39). Further study is needed specifically relating to environments intentionally designed to support learning.

Despite the obvious challenges with regard to collaborative knowledge construction, 60% of the respondents pointed out that collaborating with others and learning from each other had been one of the best learning experiences of the module. It could be concluded that *working collaboratively is very rewarding when the team is functional*. Many respondents list interaction with group members and working on the team project among their most rewarding learning experiences.

An interesting theme that rises from the data is that *using social technologies supported collaboration*. Especially using Google Docs for working collaboratively was frequently mentioned as a very valuable learning experience. Google Hangout and blogs were also seen as tools that support collaboration. As one of the participants put it, technology had made "transferring, sharing and constructing knowledge easy".

## *Reflection*

88% of the respondents found blogging useful and enjoyed using it for reflection and sharing ideas. As mentioned before, many would have wanted to have even more discussion in their blogs and would have enjoyed a more in-depth exchange of ideas and group reflection. This is also related to the biggest challenge associated with reflection: some participants felt that *lack of discussion discouraged blogging*. One of the most interesting findings of the study is directly related to this. Whereas the discouraged writers believed that others commented on their posts merely out of politeness and obligation, another participant wrote that he had greatly enjoyed reading his peers' blogs and benefited from it, although he had not commented on them very deeply. The "lurker" phenomenon discussed by Nonneke and Preece (2000) seems to apply to blogging as well. On the other hand, failure to prompt a move from the team members (Xin, 2012) seems to reduce the enjoyment of online reflection. This controversy poses an interesting challenge for course design and facilitation.

In spite of this challenging aspect, using reflection can be seen as one of the most successfully implemented elements of authentic learning in the program. The data clearly suggests that *using blogs for reflection enhanced learning*. Examples given by the respondents indicate that blogging promoted awareness of one's learning process and oneself as a learner, enriched the readings through reflection and encouraged creative thinking. Moreover, as one respondent put it: "reflecting on others' ideas helped me solidify my own ideas and understanding of the topic". Barab and Duffy (2012) support this by arguing that "too often when we are engaged in work we simply do not have the opportunity to reflect on what we are doing, are going to do, or what we have done" (p.36). To create an intentional space for this kind of reflection to occur was considered important in the design of the program as the participants were not considered to be "learning new teaching skills", but more precisely, defining and reconstructing what it means to be an educator in today's world.

*Articulation*

The significance of articulation in the learning process also became evident in the data. Whereas *the lack of articulation caused misunderstanding or conflict*, it was also very clear that *articulating one's growing understanding brought depth to learning*. Misunderstandings occurred when the team members did not negotiate meaning and had conceptualized the learning content differently. It is also an indication of simple cooperation instead of true collaboration (Herrington et al., 2010): in some teams the members merely delegated parts of the work to each other to complete individually, instead of articulating their understanding and negotiating meaning throughout the process. When the parts were finally pulled together, the end product was of an uneven quality and did not please the members of the team.

When successfully implemented, the element of articulation enriched the learning process. The fact that the learners were writing to articulate their understanding to each other instead of merely submitting work to the teacher made them reflect on what they had learned more deeply. One of the participants pointed out that at the beginning it was hard to make one's ideas and learning public, however, later on it proved to be very rewarding.

*Scaffolding and coaching*

Scaffolding and coaching can be seen as a backbone of a successful authentic learning experience. As Land, Hannafin and Oliver (2012) point out, "participation in authentic practices cannot be operationalized successfully without scaffolding" (p.11). However, alongside collaborative knowledge construction, scaffolding and coaching proved to be a challenging element in the module. Two main types of problems were identified. Firstly, there were moments when *scaffolding was provided but it was insufficient*. Participants called for more regular meetings, more clarity and more guidance, especially at the beginning of the program. Secondly, there were moments when *scaffolding was not available at all when needed.* Some participants complained about lack of communication, lack of feedback, lack of guidance and lack of involvement from the facilitator. This situation seems to reflect the phenomenon also studied by Mällinen (2010) who has found that in attempting to adopt the role of the facilitator and the "guide on the side" instead of "sage on stage" many teachers overdo the stepping aside and become "invisible". Land et al., (2012) write about the same thing, warning about mistaking a complete absence of support with student-centered learning design.

Happily, the opposite experiences were also plentiful: many learners pointed out that the facilitators had provided sufficient and timely scaffolding, giving constructive feedback, clarifying things and helping them forward with the process. Many also mentioned the positive and supportive attitude of the facilitators. Some even went on to mention their facilitators by name and express their appreciation.

*Authentic assessment*

The experiences with authentic assessment in the module go hand in hand with authentic tasks: the main challenge was that *learning outcomes and assessment criteria remained unclear* to some participants. Especially the fact that the collaborative activity was assessed caused some confusion, even frustration when some team members did not live up to the expectations of their teammates. Traditionally in education, assessment methods have reinforced what Scardamalia and Bereiter (1993) describe as knowledge reproduction, characterized by a transmission model where learners' task is to recite the transmitted information in the form of a presentation, essay or test. Therefore it is not surprising that the idea of assessing the process instead of assessing only the end products appeared to confuse some of the learners. It seems that some of the participants found it challenging to focus in the process instead of focusing in completing a given number of assignments.

## Discussion and conclusions

The analysis of the questionnaire data indicates that during the first module of the program, there were many successes in implementing the nine elements of authentic e-learning, but also several difficulties and challenges could be identified. Whereas the design process of the program was carefully conducted, the good intentions of the learning design did not always lead to the desired outcome. Although this is a case study and the results cannot be directly generalized, we believe that the central findings may benefit instructional designers and practitioners of authentic learning even in a wider scope.

It is a challenge for the developers of the program to interpret the criticism in an appropriate manner. While there clearly is room for improvement, it is important to keep in mind that some of the criticism may reflect the conflict in the participants' minds when their previous ideas and beliefs of what learning and teaching are like are being challenged. The responses to the questionnaire represent the first step of Kirkpatrick's evaluation model; **reaction**, that is, how well did the learners like the learning process. The further steps, **learning, behavior** and **results**, can only be measured in the longer term (Kirkpatrick, 1996). It has to be

emphasized here that this does not mean *reaction* has no value in evaluation. Kirkpatrick argues that "people must like most of the program to get maximum benefit from it" (Kirkpatrick, 1996, p.124).

On the other hand, basing in authentic e-learning framework, the aim of the PGCTHE program is to guide the teacher in their journey of finding their way to new methods and technologies (rather than offering a ready-made "toolbox"), and at the same time, rebuilding their professional identity. Not only facilitating the learner's building understanding of different pedagogical methods or educational technology, but also helping to develop their "general readiness to understand, follow and critically relate to the world" around them as teacher. Learning that is transformative in nature, that is, it encourages the learner to challenge his or her unquestioned frames of reference and initiate growth and change, is also bound to be somewhat uncomfortable (Illeris, 2007, p.47). Moore (2005, p.84) points out that "by avoiding transformation of perspectives, we may feel safe and secure, whereas shifting our underlying assumptions can make us feel insecure and unsure". Moreover, Sterling (2010, p.25) argues that this type of learning can be "deeply uncomfortable" and that for some learners it can even be a traumatic experience of a crisis. At the first glance, these two statements seem to be contradictory: how to implement a learning process that is authentic and transformative in nature—and thus uncomfortable for the learner—and at the same time get learners to like the program?

The confusion some of the learners experienced with regard to authentic tasks, authentic assessment and collaborative construction of knowledge indicates that the way of learning was new and challenging. However, developers of such a program should resist the temptation to add clarity by shifting to a more structured approach where complexity is prevented by simplification and by breaking the topic down into parts that are easier to handle. This model is familiar from the traditional, systems approach to instructional design (Gagné, Wager, Golas & Keller, 1992). However, this would be in direct contradiction with the principles of authentic learning. Instead of simplifying the design, learners should be provided with appropriate scaffolding, helping them learn to deal with complexity rather than avoid it. This strategy is also suggested by Herrington et al. (2010) and the results of this study prove it viable. The question we are now facing is: how can the learners' adaptation to the new framework of teaching and learning (which is after all the main theme of the entire study module) be better facilitated? How to provide sufficient scaffolding without making it too much so that it actually suffocates the learner and prevents the development of conative abilities? The role of the facilitator should also be explored further regarding another challenge that arises from the data; the formation of the learning community and its significance in the learning process.

Another important area for further research is the impact of cultural aspects in authentic e-learning. Learners always bring their own history, knowledge, assumptions and attitudes to a new learning situation. Land et al. (2012) suggest that learners hold powerful beliefs that are deeply rooted in their everyday experience—so deeply that they tend to persist even in the face of contradictory evidence. Mezirow (2000, p.7) reminds us that "...understanding will be enabled and constrained by the historical knowledge-power networks in which it is embedded... we need to focus on who is doing the learning and under what circumstances to understand the transformative learning process". In a multicultural learning context such as the PGCTHE, it is especially relevant to consider the impact of culture on how the participants perceive teaching and learning (see e.g. Oxford & Anderson, 1995). This is an interesting question that deserves further research.

As Barab and Duffy (2012) point out, "we are witnessing a period in which theories of learning and cognition seem to be in a state of perturbation, with numerous books and scholarly articles being published that forward radically new theories of what it means to know and learn" (p. 29). The PGCTHE program is one example of bringing these theories into practice. Without a continuous dialogue with theory and practice among designers and practitioners, the potential impact of theories in actual educational practice remains limited at best.

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