

Electronic Portfolios, Student Reflective Practices, and the Evaluation of Effective Learning

Abstract

Electronic Portfolios provide a useful means of promoting as well as assessing the development of student learning over time. The most effective electronic portfolios link student reflective practice with products and performances, which indicate a hands-on and applied acquisition of practical skills and knowledge involving learning technologies. The process of action-reflection is important in that it helps people develop more appropriate and effective ways of working. Moreover, it develops independent learning, and fosters a problem-solving, solution-orientated approach to the learning process. To what extent, then, might student reflections serve as a reliable indicator of effective learning in general, and of applied use of learning technologies in particular? This paper thus considers the connection between student reflective practice and effective, applied learning within the authentic contexts of learning represented by electronic portfolios. It will further discuss the question of how best to evaluate and assess student reflections as a part of a developmental process linked to specific portfolio products or performances.

Introduction

The professional courses such as teacher education have assumed that academic research yields useful professional knowledge and that knowledge taught in the schools prepares students for the demands of the real life practice. Both assumptions are becoming increasingly questioned. In addition to the gap between research and its usefulness there is the increasing problem of the IT competencies of the professionals in the working environment. In today's world learning needs to become self sufficient, self-reliant or self-directed activity not only for successful living but as a basic survival skill. Knowledge and information and our ability to access to each are increasing at exponential rates. Professionals, teachers and others need to learn to select the appropriate information and to apply in their practices. Creating electronic portfolio provides the opportunities to learn to decide, to select, to design, to develop and to reflect. Student-teachers learn to evaluate their own learning and to evaluate others through peer evaluation.

Classroom assessment measures, in the past often limited to multiple-choice and standardized tests, now can involve the creation of portfolios, or collections of pieces of work which the student selects as the best representation of his or her efforts, progress, skills, and accomplishments. Portfolios can come in several varieties, such as: "developmental" portfolios document improvement in a designated subject area; "teacher planning" portfolios allow teachers to gauge the ability levels of an incoming class; "proficiency" portfolios can be used to determine graduation eligibility; "showcase" portfolios can assemble the best work done across an entire educational career; "employment skills" portfolios can collect assignments that demonstrate work readiness; and "college admission" portfolios can be solicited by admissions officers to judge an applicant's potential for success at a certain academic institution (Lankes, 1995).

In the literature survey the author has found that there is a substantial body of literature (e.g., Clift, Houston and Pugach, 1990; Ross, 1989), expressing the opinion that reflection is

beneficial without providing supporting research data. In this research the author describes the procedure for introduction of electronic portfolio in the foundation course of IT in teacher education program. Students were allowed to design their own portfolio no template was provided only the overall contents to be include in the portfolio was explained. This provide the opportunity to the students to come out with their own preferred style of portfolio making which reflected their own pattern of knowledge construction. Student's self-reflection is an integral part of the portfolio development for learning and evaluation. According to the definition: learning is behaviour modification. Students learn psychomotor and cognitive skills by manipulating and interacting with different kinds of supporting tools. They learn to evaluate by reflecting on their action and in this way the action reflection cycle continues.

Action Reflection

The sort of know how we reveal in our intelligent action-publicly observable, physical performances like riding a bicycle and the private operations like the instant analysis of a balance sheet. In both cases the knowing is in the action (Schon 1987). Knowing in action is a dynamic phenomenon, whilst procedures, rules and theories are static. Knowing suggest the dynamic nature of knowing in action, which is the conversion of knowledge in action. Knowing is automatic, reflection is when we think and contributes to knowledge in action. We learn, say that we learn from our mistake which also means we reflect upon our action and improve.

The process of action-reflection is inbuilt in the formation of an e-portfolio. The e- portfolios show a more complete picture of student progress and achievement than traditional approaches to assessment. Students can demonstrate a variety of competencies, take greater responsibility, and became skilled at self-evaluation by developing e-portfolios.

Smith (1996) suggests that any attempt to facilitate reflective abilities in student teachers cannot be serendipitous or spasmodic. Instead it must be organized in a deliberate and explicit program of sequenced activities that lie at the core of the teacher education program. Gustafson and Bennette (1999) discussed about eleven variables responsible for promoting reflection. These eleven variables can be grouped together under three major categories, such as: learner characteristics, environmental characteristics and reflection task characteristics.

In a foundation introductory course of IT in education we have introduced the concept of e-portfolio. The author has found that integration and the link among the different activities performed by the students in a course is very crucial (Bhattacharya and Richards, 2001) where the students can visualize the learning as a whole and not as bits and pieces of task to complete. Author's purpose for the introduction of e-portfolio is to assist students to better understand and be able to articulate their learning as they developed their personal professional knowledge and skills about IT in education.

Liston and Zeichner (1996) proposed a five-part taxonomy of reflection. According to them reflection can occur: rapidly during an action, thoughtfully during an action, briefly as a review after action, systematically over a period of time after action, or long-term as one attempts to develop formal or informal theory. In the present study the students were asked to reflect on each of assignments and activities including on-line discussions and finally a reflection on the overall course design. Feedback was given to the students through peer evaluation and tutor's comments. The constructive criticism provided in this form proved to be helpful to the students for further improvements and modifications on their initial draft for product design.

Assessment of Student Reflective Practices

This study examines reflection and role of reflection in the process of learning and evaluation of learning outcomes in the development of IT competencies and its application in order to develop constructivist-learning packages for students in schools to inculcate higher order thinking skills. This is a foundation course meant for the pre-service teacher education program. The present study focuses on the student's self-reflection for the assessment of portfolio. The author has explained the design of the rubric for evaluation of reflection. Students' reflections are considered as the detail analysis of their learning process through different activities embedded in the course.

Reflection can be regarded as a reference to the various ways in which we can better understand our professional competencies. It is an open subject that allows the trainee to understand, research, and evaluate our practice, i.e., our work. Reflection is a macro activity as the art of reflection takes place within a context governed by the contributing parts to its environment. This lack of predetermined outline of reflection creates the burden of intellectual and moral uncertainty, as well as the probability of personal challenge for the trainee. The justification for the reflection it helps one to be away from routine, to be able to realize one's own progress and to be able to self-evaluate learning. It allows us to interrogate our work and to seek inspiration to improve our work. In the present study the author have asked the students to put all the versions of their work and not only the best ones in their portfolio so that the evaluator as well as the learners can see the process of learning through different activities, i.e., students progress over time. The electronic portfolio thus becomes the space for maintaining an activity check-list along with reflections and the products.

Cumming and Maxwell (1999) identified four major interpretations of authentic assessment:

- performance assessment or tasks assessed by actual demonstration;
- situated assessment or tasks assessed in context;
- problem-based assessment or assessment of tasks that involve more than mere technical facility;
- competence-based assessment or tasks assessed for competence in the workplace.

The common element in all authentic evaluation process is that: it involves a variety of assessment strategies that capture the quality of a student's work, these assessments explore a student's normal daily performance rather than focus on tests, and such assessments reflect the actual learning and teaching of the classroom and beyond. Now when we talk about electronic portfolio then it serves as a tool for both learning and assessment, which reflects each of these emphases. That means it is not possible to implement the strategies and the procedure of evaluation similar to that is used in assessment of examination papers. We need to evaluate not only the final product but also the process of learning, the pace of learning, the organization of the products and events of learning (recording the moment of "eureka" feeling), richness of the content, learners depth of thinking, learners ability to understand own knowledge structure and the ability to fill the gap, collaborative and cooperativeness, readiness to learning, ability to improvise and to innovate, etc.

Review of some of the available instrument or rubric for assessment of students' electronic portfolios was conducted. Some of the typical examples are: the "Rubric for Professional Portfolio" (UNI, 2000) where the assessment is based on four levels of achievements in seven categories:

1. Meets portfolio specifications

2. Community involvement
3. Rapport development
4. Instructional management
5. Initiative/independence
6. Teamwork
7. Overall quality of presentation

The "Electronic Portfolio Scoring Rubric" (Worcester, 1997) is based on a scale of 17 points, distributed as 5 points (missed the mark), 10 points (getting close), 1 points (right on target) and finally 17 points (bulls eye) for 6 different criterion: Title card, mechanics, buttons, sounds, content of project reflections and personal reactions to projects. Mentioned three major assessment categories: products, process and perceptions but do not elaborate on any of these categories. In all these examples we can see that assessment rubric for evaluation of electronic portfolio varies a lot from assessment of the learning process to the product of learning outcome depending on the evaluators objectives.

The evaluation rubric for assessment of online discussion and reflection used in the University of San Diego in the Character Education Program (Williams, 2000) was also reviewed. This is a rubric in a descriptive format also used to provide guidelines for the students. In the present study the author has generated a generic pattern of the rubric for Evaluation of Reflection, which could be applicable in any kind of learning process. The rubric has been design based on the attributes of meaningful learning (Fig.1) or characteristics of meaningful learning (Fig.2) by Jonassen (2001).



Figure 1: Attributes of Meaningful Learning

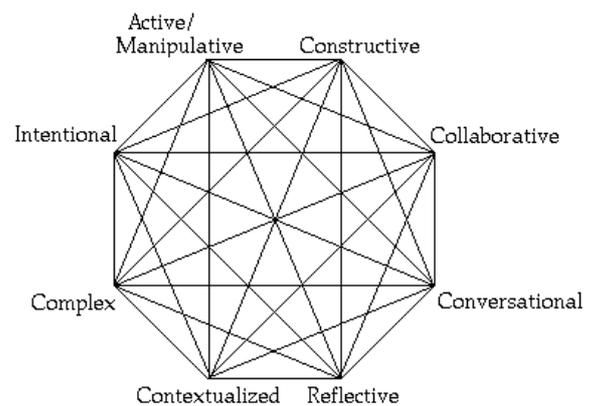


Figure 2: Characteristics of Meaningful Learning

Our rubric for "evaluation of reflection" consists of six categories such as: Collaboration and Cooperation; Metacognition and Progression, Critical Thinking and Decision Making; Conceptualization and Implementation; Creativity and Innovation; and Evaluation and Improvement. All these categories are very much interconnected. Among each pair of words one word complements the other. Such as Progression is the manifestation of Metacognition, Critical Thinking is a characteristic of a good decision maker, and so on. The rubric is presented as a hexagonal cobweb structure where each of the vertices refers to one of the criteria of evaluation and each criteria is rated on a five point scale where the vertices of the innermost hexagon represents lowest ratings and the outermost hexagon represents the highest ratings. Detail description of ground-rules for the ratings was also developed in order to standardize the ratings. The diagram in figure 3 shows the typical pattern of assessment results of a student's reflection.

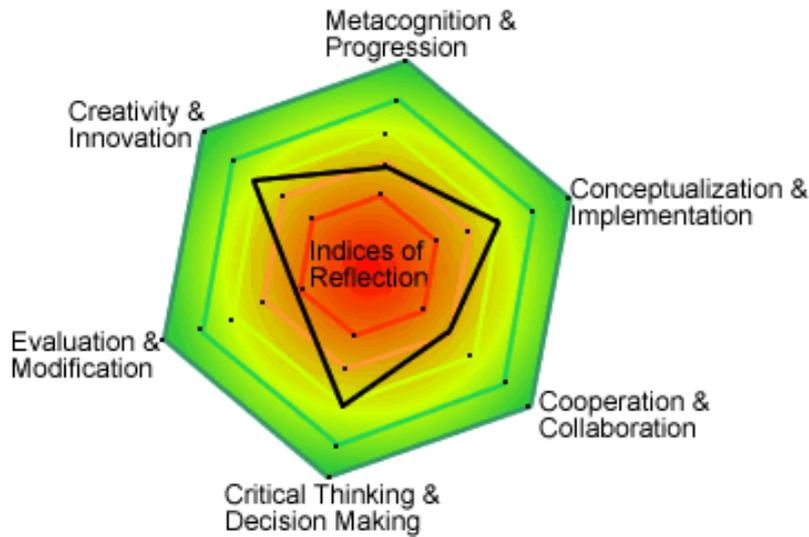


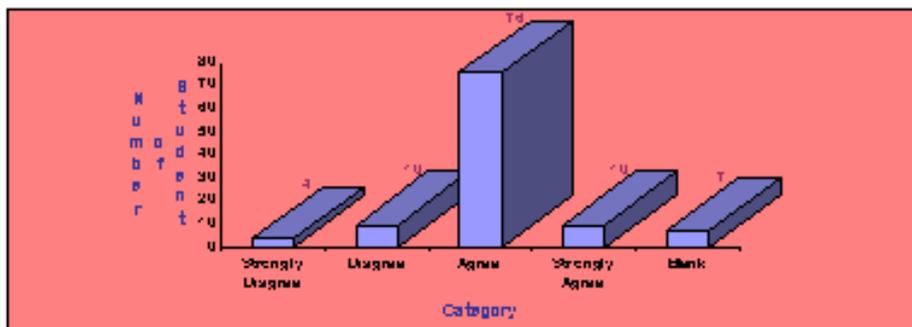
Figure 3: Rubric for Evaluation of Reflection

Based on these criteria for assessment it was possible to find out students progress, understanding, attitudes, skills and abilities.

Students' Feedback

Students' feedback on the course was gathered in the form of reflection on the course and by collecting data through a questionnaire survey. The typical response to an item of the questionnaire and its interpretation is given in figure 4.

By designing and developing the electronic portfolio I learnt to organise my learning activities more effectively



Electronic portfolio provided the students a chance to see their progression in learning and to visualize how all the learning , activities and assignments are linked together.

Fig. 4 Students response to an item of the course evaluation questionnaire

Reflection and Conclusion

The challenge faced by the student teachers was to maintain both the quality of experience and the commitment to reflective practice in a situation where the opportunity for interaction was necessarily limited in a teacher education program.

Flexibility in task assignment and its integration where learning could be seen linked progressively in the form of the process and the product. In this case students have more opportunities for creativity.

The rubric for evaluation of reflection given in this paper is based on the outcome of the research on constructivist learning environment; therefore, it provides a very clear picture of the students learning process, their efforts, achievements, collaboration, failures, etc.

Future Work

In future the plan is to implement the same instrument for a larger number of population in different courses. Also if possible a computer-generated rubric will be developed for faster processing of data. Future research will consist of the results of the follow up study in order to respond to the most basic question, that whether teachers exhibiting reflective practice are more effective than those who don't.

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