Virtual Portfolio: A Strategy for Learning Assessment in a Graduated Virtual Program

Results of a pilot study

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***Abstract*—Learning evaluation in a graduated master virtual program was assessed using virtual portfolio strategy as a tool to assess learning. A pilot study determined dimension and direction of interactions between students and professor during the first quarter of the program. Results show the most frequent dimension was social (55,9%), followed by procedimental (41,4%). In direction student /professor (32,7%) was the most, followed by professor /student. The predominance of social interactions might be explained because this research was done at the very beginning of the program. We expect the analysis of subsequent recorded chat session, forums discussions and people´s comments will show progressively switch toward cognitive interactions.**

***Index Terms*—component; educational measurement; evaluation; Education Distance; higher education**

I. INTRODUCTION

In order to strengthen and build capacity in program management of food and nutrition security in the region, the School of Nutrition (ENUT) at University of Costa Rica (UCR) jointly with Universidad Nacional (UNA), brought a program for postgraduate training of professionals in charge of food security programs. Its goal is to contribute to enhance management capacity of program managers to protect food security for the most vulnerable population in Latin American countries.

In this program, priority is given to the training of human talent with emphasis in management skills using of information and communication technologies (ICTs). This approach support programs contributing to eliminate geographic barriers optimizing the use of institutional resources. It is expected to occur in relation to postgraduate programs and projects directed to achieve the Millennium Development Goals (MDGs) in food and nutrition security.

In order to contribute to the creation of human talent, learning is defined more broadly than just the ability to state facts or get new knowledge. Another definition states human talent is "ability of a person to understand and intelligently figure out how to solve problems in a particular occupation, taking skills, abilities, experiences and aptitudes of talented people. Not only the effort or human activity, but also competencies (skills, knowledge and attitudes), experiences, motivations, interests, vocations, skills, potential health, among other elements" (Bonilla, 2008).

Food and Nutrition Security programs in Latin America may use ICTs to enhance human talent management. This approach has become a formula conducive to make better use of the capabilities of people and communities. The virtual master program for Management of Food Safety programs (MGSAN), developed by UCR and UNA, takes advantage of the collaboration and synergy between two Costa Rican public institutions of higher education. MGSAN is a graduate master program organized in modules, designed in a competency-based education strategy; it has a constructivist approach. The present study for learning assessment using virtual portfolio was proposed in 2009 in consistence with the core of MGSAN.

II. LEARNING ASSESSMENT IN A VIRTUAL POSTGRADUATE PROGRAM

Evaluation aims to assess the knowledge, skills and abilities acquired and in progress by students enrolled in learning programs (Quintana, 2000). It has become object of research in education and turned in a powerful tool to improve teaching and learning. This paper seeks to evaluate the use of virtual portfolio in a virtual learning program.

Portfolio, as defined by Arter and Spandel is "a collection of student works that tells the story of their efforts, progress and achievements in a given area. This collection must include student participation in selection of portfolio content, guidelines for selection, criteria for judging merit and evidence of their self-reflection" (Klenowski, 2005).

A virtual portfolio can provide an effective means of learning assessment and meaningful information about learning experience. Purpose of the portfolio is to present and document the work and the process the student has taken to reach a certain point.

Through dialogue and interaction across the portfolio the student receives feedback from the tutor, from peers and other stakeholders to meet one or all of the purposes of evaluation: summative, certification, selection, promotion, appraisal, training, and the account for what has been done to reinforce teaching and learning (Klenowski, 2005). Records containing the evidence can be stored, organized and reorganized for different purposes, i.e., relate student's strengths and weaknesses in order to make more relevant the subsequent experiences.

They also include information, artifacts and reflections beyond the courses the student is performing. A virtual portfolio is different because it brings a greater chance of

sharing in virtual networks, process monitoring, interactivity and updated resources used to enable better communication between students and teacher.

The present report show results of a pilot study in the use of virtual portfolio for learning assessment linked to the learning platform available in the MGSAN. In particular, virtual portfolio, as an electronic application, is expected to assess the amount and quality of interactions: participant-participant; participant-system and participant-tutor. The objective of this research is to approach to the role of virtual portfolio as a tool to assess learning.

This goal requires deepening learning evaluation concept and relating interactions with course content, abilities and skills got in MGSAN. The concept has resumed importance recently, as several authors agree interaction is an important element in online education.

III. CONCEPT AND IMPORTANCE OF INTERACTION

Interaction is "reciprocal action or influence" (Dictionary, 2008). Hillman, Willis and Gunawardena cited by Northrup (2002), proposed a simple definition: interaction is commitment to learning. On the other hand, Yacci adds interaction is: "Interactivity (interaction) occurs from the learner's perspective and does not occur until mutually consistent messages have been issued by the student and have returned forming a loop, producing content learning and affective benefits" (Yacci, 2000).

A. Types of Interaction

Moore (1989), identified three types of interaction. He suggests all distance educators shall use all three types of interaction. The first is student-content; it is characteristic of education process. The process of interacting with intellectual content causes changes in understanding, perspective or in students' mind.

The second is the student-teacher interaction, it occurs when the teacher uses planned or received content to motivate students to learn and to improve and maintain student´ interest, self-direction and self-motivation. Teacher provides information, makes demonstrations of skills, or models attitudes and values. The teacher asks the students to demonstrate what is being learned, whether practicing skills, or by means of manipulation of information and ideas presented. The teacher organizes the evaluation to determine whether students are making progress and decides to change strategy if needed. Finally, the teacher provides advice, support and encouragement to students.

In student-student interaction, as a dimension of distance education, it is meant inter-learning to occur. The interaction between a student and other students, alone or in groups, with or without real-time presence of an instructor, is an extremely valuable resource for learning (Moore, 1989).

An additional interaction type, student-interface inter-action, was added by Hillman, Willis and Gunawardena, cited by Hirumi (2002). They propose interface acts as the mean of communication between student and content, the instructor, peers or others. This element includes the use of electronic tools and aids in navigation and the design of graphic elements and text.

Atsusi Hirumi (2002) developed a framework for the types of interaction in distance education (Figure 1).

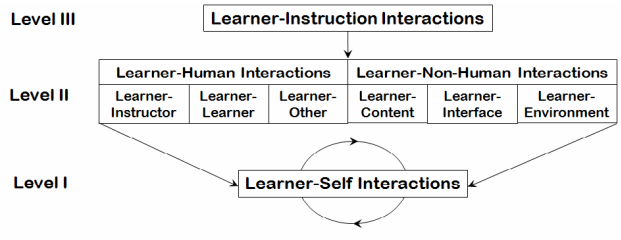

Figure 1. Three levels of planned Elearning Interactions (Hirumi, 2002)

The scheme shows three possible levels and introduces self-interaction already mentioned by other authors. Hirumi defines interactions from the students´ perspective. He states Level I type occur within each individual learner including the cognitive learning and metacognitive processes. Level II interactions occur between student and other learning resources either human or non-human.

Level III delineates an eLearning strategy; a set of level II interactions that are designed and sequenced to stimulate Level I interactions.

Specifically, in MGSAN, self-interactions are understood as changes in attitudes and values that learners experience as consequence of reflections during their participation. Level II interactions are mediated by the classroom and virtual portfolio while the learner-environment interaction relates to activities that occur outside the system interface, do not occur online. By the same token, in level III interactions all the events needed to provide educators and learners with the MGSAN scenario are included.

B. Patterns /dimensions or interactions

The dimensions of interaction have been explored by several authors (Sohn, 2005), (Chou, 2003), (Chen, 2004). Martin reviewed the extant literature on interaction for asynchronous and synchronous systems (Martin, 2012).

On the other hand, Bing (2008) proposed the following dimensions to compare the interaction of two sets of open and distance learning. Table 1 shows Bing`s categories to analyze the distribution of interactions in asynchronous forum interactions and synchronous chat sessions of first year degree courses in Malaysia in 2007.

TABLE I.
BING`S CATEGORIES AND DIMENSIONS OF INTERACTIONS. MGSAN, SEPTEMBER 2010

1	Social	Includes discussion of social nature which are not directly associated to course contents
2	Procedural	Involves explanation on course related procedures, requirements and administrative issues
3	Expository	Involves demonstration of knowledge /facts without much further elaboration
4	Explanatory	Refers to elaborated explanation on knowledge and develop content based on learner´s response.
5	Cognitive	Involves providing constructive feedback and detailed commentary on course contents via critical thinking which leads to knowledge development

TABLE II.
CATEGORIES OF DIRECTION OF INTERACTIONS. MGSAN, SEPTEMBER 2010

1	Course coordinator -> groups (Cc-G)	Course coordinator initiates a discussion and address to all the groups or students.
2	Student -> course coordinator (S-CC)	A student initiates a discussion and directs to course coordinator
3	Student -> group (S-GG)	A student initiates a discussion and address to the entire group.
4	Tutor -> group (A-T)	A tutor initiates a discussion to his /her own group of classmates
5	Student -> student	A student initiates a discussion and addresses it to another student.

Bing also classified interactions according to who was the initiator or respondent in the communications occurred in the course. It was useful to find out in which direction the course "moves" (Table II).

IV. PILOT STUDY IN MGSAN

The purpose is to explore the ease of its application for quantitative analysis of interactions under a master program. The aim is to describe the distribution of the interactions according to person (teacher or student), dimension (social, procedural, expository, explanatory or cognitive) and direction (source /target).

In the present report, Bing`s classification for dimensions and direction has been applied to the forums and chat transcripts of the pilot chat sessions done in the courses of the first trimester of MGSAN in December 2010.

Results show that the most frequent dimension found was the social, 55,9%. In second place, procedimental dimension was found.

The initial analysis shown here provides elements for a thorough analysis and comprehensive interaction between teachers and students (Table III). The input were the records of communication events between teachers, students, coordination and user support. No cognitive dimension was identified.

In the period studied, predominance of social interactions was observed (Table 4.). It is explained because the data of chat records occurred during the first period of the master program.

The subsequent terms were adjusted to the corresponding needs that arose, both in terms of virtual academic communication as well as administrative aspects. Hopefully as the mastery is ongoing, interactions are expected to change gradually and reflect more options of learning dimensions. Data from forums, chats, emails, comments and feedback from teachers and tutors would be the primary data source for documenting participants´ process.

In terms of direction of the communication, the most frequent direction of interaction occurred between student -> teacher, in second place, between teacher -> student and teacher -> group (Table IV).

TABLE III.
DISTRIBUTION OF INTERACTIONS ACCORDING TO DIMENSION CATEGORIES. MGSAN, 2010

Dimension	Freq.	%	Valid %	Cumulated %
Social	104	55,9	55,9	55,9
Procedimental	77	41,4	41,4	97,3
Expository	3	1,6	1,6	98,9
Explanatory	2	1,1	1,1	100,0
Total	186	100,0	100,0	

TABLE IV.
DISTRIBUTION OF DIRECTION OF INTERACTIONS ACCORDING TO DIRECTION (INITIATOR /RESPONDENT) MGSAN, 2010

Initiator /respondent	Freq.	%	Valid %	Cumulated %
Student / professor	61	32,7	32,7	32,7
Professor / student	48	25,8	25,8	58,.5
Professor /all group	39	21	21	79,6
Student /all group	34	18,3	18,3	97,8
Student /student	4	2,2	2,2	100
Total	186	100,0	100,0	

To interpret this result, it should be noted that actions like "ask to intervene ", "I´m done," "finished" or "I have a question" were based on different combinations of text, signs or emoticons. Such combinations came from an initial agreement among the guests to the chat session. The agreements allowed chat organization and helped to set order of participation; doing so, all guests had a chance to participate. The professor leading the chat was the moderator.

V. IMPLICATIONS

Methodology used in these pilot data provides useful results to analyze all the recorded chat session, forum discussions and people´s comments. Data which took place in all MGSAN asynchronous sessions can be analyzed by course, teacher and quarter to identify changes and to monitor trends in dimensions of interaction in MGSAN` program. It is expected results will open the possibility and needed resources so that teachers of this program are able to progressively move from social to cognitive communication.

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