USE OF A MULTIMEDIA COURSEWARE IN AUTHENTIC LEARNING IN NURSING

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ABSTRACT

This study describes the use of a multimedia courseware in nursing and evaluates its design and implementation in supporting authentic learning. The multimedia courseware contains a virtual representation of a hospital, some videos of actual cases of patients, and authentic learning activities intended to help postgraduate students master clinical competencies in nursing. The courseware was examined to see how the elements in authentic learning were applied. Students who used the courseware were asked to participate in a survey to evaluate their experiences. Results showed that they found the courseware useful because it: (1) shows the scope and processes of the practicum; (2) illustrates the clinical practicum setting; (3) details patient assessment and care; and (4) stimulates critical thinking and improves decision-making skills. The use of the courseware was recognised as an important step in preparing students for actual clinical practicum. It exemplifies the use of technology in providing students authentic learning through an open and distance eLearning environment.

Keywords: authentic learning, multimedia courseware, nursing

INTRODUCTION

Learning-by-doing is generally considered the most effective way to learn (Lombardi, 2007). However, this can be a challenge in distance education courses, where students are separated geographically from the teacher and from each other. Moreover, learning-by-doing may not always be possible when learning difficult tasks, such as those in nursing competencies in actual patient care settings, or when required patients are not available or accessible.

Fortunately, new learning technologies, such as multimedia courseware and interactive activities, have made it possible for students separated by distance to learn by doing and explore scenarios together without leaving their place of work or residence. The use of animation and simulation technologies also allows students to experience authentic learning without the usual limitations and constraints of real-life scenarios.

Authentic learning is defined as learning that uses real-world problems and projects that allow students to explore and discuss these problems in ways that are relevant to them (Carlson, 2002). It involves alignment of student learning experiences with the world for which they are being prepared (McKenzie, Morgan, Cochrane, Watson, & Roberts, 2002). Authentic learning typically focuses on real-world, complex problems and their solutions, using role-playing exercises, problem-based activities, case studies, and participation in virtual communities of practice (Lombardi, 2007).

The use of courseware in authentic learning has also been questioned in some literature. Hummel (1993) contends that it is the courseware, and not the authentic situation, that becomes the learning environment. Tripp (1993) also states that computer-based simulations are not sufficient and reiterates that

> "True expertise is learned by being exposed to experts". (Tripp, 1993, p. 163)

However, Herrington and Oliver (2000) argue that computer-based representations do provide a powerful and acceptable vehicle for the critical characteristics of the traditional apprenticeship. Moreover, they cite many researchers who report that the computer can provide an alternative to the real-life setting, and that such technology can be used without sacrificing the authentic context which is such a critical element of the model (Herrington & Oliver, 2000). In this paper, the use of multimedia is explored to show how it can support authentic learning in nursing.

OBJECTIVES

This study describes the use of a multimedia courseware in facilitating authentic learning of nursing students enrolled in a clinical practicum course offered in distance education mode. The learning environment is based on an actual, albeit virtual, hospital and orients the students to the 'real-life' hospital setting.

The courseware entitled, "Virtual Clinical Experience" was developed by the University of the Philippines Open University with the aid of a grant from the International Development Research Centre (IDRC). The purpose of the courseware was to introduce students to the actual clinical practicum by simulating actual scenarios they are likely to encounter and structuring their learning activities around real tasks.

The objectives of the study are to:

(1) Examine the application of the elements of authentic learning in a multimedia courseware; and
(2) Describe the experience of students in using the multimedia courseware.

CONCEPTUAL FRAMEWORK

Herrington (2006) presents nine principles used in guiding the design and implementation of a learning environment that enables authentic learning (see Figure 1).
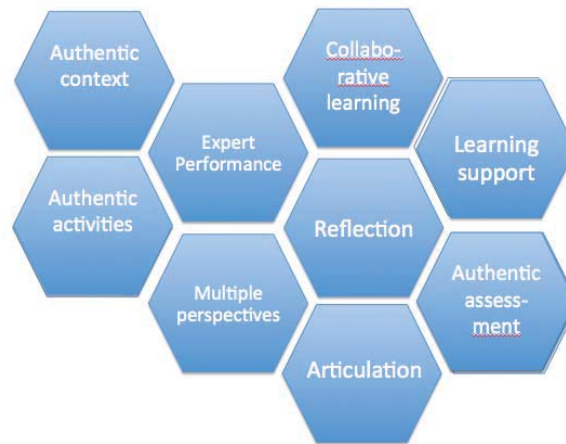
Figure 1: Elements of authentic learning in the courseware

The first element in the design of an authentic learning environment is providing an **authentic context** – a setting for the learning tasks in solving of complex problems. It could be a physical or virtual environment that reflects the way knowledge will be used in real life. Next is designing an **authentic task** for students, which is the most important of all elements of authentic learning; and there should be clear goals which should be relevant to real life (Herrington, 2006). Providing access to **expert performances** and the modelling of processes is also important. This cannot be satisfied by reference to a single expert view, but must be distributed across several experts (Herrington, Reeves, & Oliver, 2010). **Multiple roles and perspectives** in authentic tasks provide the opportunity for students to examine the task from different perspectives, using a variety of resources (Herrington et al. 2010). **Collaborative learning** is also important in helping students in problem solving, reflection and articulation (Herrington et al., 2010). An authentic context and an authentic task enable students to **reflect** and the strategy of asking students to keep a personal diary encourages self-reflection. Promoting **articulation,** to enable tacit knowledge to be made explicit, is another principle of authentic learning. Therefore, the need to incorporate opportunities for learners to discuss and present arguments in a group, (Herrington, et al., 2010). Coaching and scaffolding (**learning support**) by the teacher at critical times, rather than giving them the answers or information, further help students at metacognitive level, which is a hallmark of authentic learning. Finally, providing for **authentic assessment** of learning within the tasks is crucial. For example, an e-portfolio assesses the student's ability to "efficiently and effectively use a repertoire of knowledge and skills to negotiate a complex task" (Wiggins, 1998, p. 24). This reflects actual roles of nurses in the real world.

MATERIALS AND METHODS

The courseware was examined using the guidelines for design and implementation of the learning environment that enable authentic learning (Herrington, 2006; Herrington et al., 2010). Aside from this review of concepts, students (n=53) enrolled in the clinical practicum course were surveyed on how useful the multimedia courseware was in preparing them for the actual clinical practicum. The survey contained open-ended questions exploring their insights and reflections on the usefulness of the courseware and how it helped them in the actual clinical practicum.

RESULTS AND DISCUSSION

Exploration of the multimedia courseware

The courseware includes audio-video materials on skills development needed in the clinical practicum such as: conducting history taking, physical assessment, nursing diagnosis and planning nursing care. The content is organised around case studies featuring common patient conditions encountered in adult care settings in the hospital, specifically: chronic heart failure, stroke, breast cancer, chronic obstructive pulmonary disease and dementia. Teaching and learning activities involve formulation and implementation of a nursing care plan and organising a learning portfolio that provides evidence about the clinical practicum experience. Learning support materials include additional resources, feedback mechanisms to formative evaluation and templates for case studies, performance checklists, and personal journals.

The features of the courseware include the following: (1) interactive site map, (2) audio-video materials, (3) lessons and resources, and (4) learning outcomes. The interactive site map is in the form of an interactive hospital setting which features the nurses' station, patient rooms, and other essential things like patient charts and medication charts.
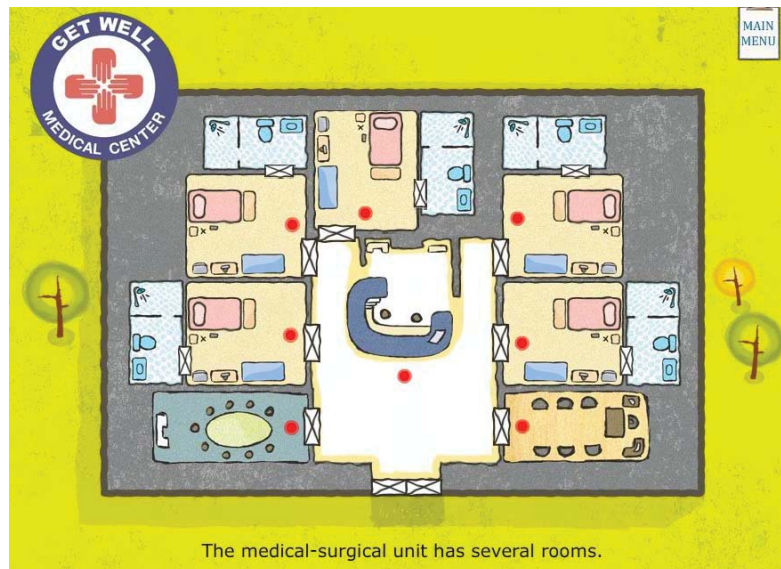

Figure 2: Interactive sitemap in the courseware

The audio-video materials contain authentic examples of conducting nursing history and physical assessment of patients with the following conditions: chronic heart failure, breast cancer, stroke, chronic obstructive pulmonary disease and Alzheimer's disease. The audio-video material also includes video clips of a nurse supervisor providing orientation on nurses' expected tasks in the adult care hospital setting. The lessons and resources are structured, with guides and links to resources on specific nursing interventions for the above patient conditions. The learning outcomes are organised in the form of a student portfolio, which includes the following: (1) student performance checklist (self-evaluation and preceptor evaluation) to keep track of competencies that have been achieved and what else needs to be performed; (2) student personal journal showing reflection on practicum experience; (3) review of journal articles to guide in making reviews of published journal articles relevant to practicum cases; and (4) case study templates for nursing history, assessment, care plans and case reports to guide in submitting relevant papers.

Figure 3: Authentic activities in the courseware

Authentic activities are incorporated into the courseware to provide complex and sustained tasks for students. The tasks are presented to the students in the sequence that they usually occur in real settings but some options are given for non-linear navigation of resources. Students are also required to work with each other and other health care team members by taking note of the collaborative interventions.

The elements of an authentic learning experience in the courseware were examined based on the guidelines for design and implementation of the learning environment that enable authentic learning (Herrington, 2006; Herrington et al., 2010). Table 1 presents the results.

Table 1: Elements of authentic learning applied in the multimedia courseware

Elements of authentic learning	Application in the multimedia courseware
1. Authentic context	• The courseware's interface is a hospital floor showing the nurses' station, patients' rooms, nurse supervisor's room and meeting room for the health team. The rooms are filled with essential details needed for the assessment and care of the patients, such as patient charts, medication charts, medical equipment and supplies. • Students are required to follow a certain order in completing specific tasks but can choose randomly which patients to follow. • The courseware contains a large number of resources including: five complete case studies, five patient scenarios, ten video clips of patient assessment, 15-20 photos and video clips of other resources such as diagnostic tests and laboratory findings, five video clips of case discussion and sample templates for documenting patient care.
2. Authentic tasks and activities	• Activities shown in the videos mirror the actual patient assessment in the hospital, which includes history taking and physical examination. • There is no prescribed care of patient presented. The actual care of patient would depend on the student's assessment findings after watching the videos. • Each case presents a complex task, i.e. planning the nursing care of patients with each condition.

Elements of authentic learning	Application in the multimedia courseware
	- Students are given the opportunity to define the activities around the nursing care of patients. - Students are given a week to view the courseware and another week to submit the required assessment portfolio. - Group activities are created to encourage collaborative learning. - Assessment strategies can also be used in other courses.
3. Expert performances and modelling of processes	- Links to experts and resources are given to students. - Students come from different settings and levels of expertise. - Discussion forums enable student sharing of stories, learning and experience. - Videos are filmed showing real nurse-patient environment in a hospital
4. Multiple roles and perspectives	- Cases are discussed showing both medical and nursing perspectives. - Different points of view are encouraged through collaborative work. - Five patient case studies are provided in the multimedia courseware and serve as examples for the students in developing their own case study from the actual clinical practicum.
5. Collaborative construction of knowledge	- Tasks are created such as creating a blog, wiki or journal club for discussing relevant research articles. - Students are divided into smaller groups of five members each to facilitate better collaboration. - Grades are given to groups for the collaborative exercises.
6. Reflection	- Students are encouraged to reflect on patient care in the hospital setting and their actual roles as nurses. - Students are provided with non-linear navigation of resources available for planning and implementing care of patients. - Students are encouraged to read references and compare their plan of care with existing nursing interventions and outcomes for specific patient conditions. - Students are given the opportunity to compare their plan of care with each other.
7. Articulation	- Students are given a complex task in planning the care of patients, which necessitates discussion with others. - Groups are created to facilitate discussion of the cases and the specific nursing care needed. - Discussion of the nursing care allows students to explain the nursing interventions selected for the patient.
8. Learning support	The courseware provides a complex learning environment for students, which mirrors real settings.

Elements of authentic learning	Application in the multimedia courseware
	• A course guide was created for facilitators and students to support their use of the courseware. • Suggestions on how learning can be supported are provided to maximise the learning opportunities in the courseware
9. Authentic assessment	• The context is very similar to adult patient care in a hospital setting. • Students are required to submit an assessment portfolio that should contain a performance checklist, personal reflections, review of journal articles, and nursing care plan. • Students are required to spend time and effort in exploring the multimedia courseware, developing the plan of care, working together with group mates on selected activities, and organising their assessment portfolio. • Complex tasks, such as developing a plan of care, depend on the findings and diagnosis resulting from the students' assessments. • Students are assessed based on what has been learned in the multimedia courseware • Students are required to submit written reports as well as make an oral presentation of the plan of care. • Scoring rubrics are given for the grading of student portfolios.

Authentic context

As described by Herrington (2006), an authentic context provides the setting for learning tasks in solving of complex problems. In this study, the authentic context presented to students was the virtual environment of a multimedia courseware. It had the visual and conceptual structure of a hospital, where students were free to explore and to apply the concepts they have learned in the course. Five comprehensive case studies were presented to help students apply the concepts in real-life settings. Students had access to a multimedia courseware rich in audio-video materials, interactive texts and graphic animation. They appreciated the real-life scenarios and the attractive interface that made for an authentic environment.

Authentic activities

Designing an authentic task for students is the most important element of authentic learning. As stated by Herrington (2006), there should be clear goals and they should be relevant to real life. In the courseware, the learning activities match the real-world tasks of nurses as closely as possible. Critical characteristics of authentic activities were incorporated into the design of the courseware to enhance online learning, which according to Herrington, Reeves, Oliver, and Woo (2004) is the real value of an authentic activity, not the real-life location and practice. Authentic activities were shown in the video materials of the courseware and students were asked to do real-life tasks of nurses in hospitals. The virtual location provided the environment for nurses to practice specific skills.

Expert performances

According to Herrington et al. (2010), expert performance and the modelling of processes cannot be satisfied by reference to a single expert view, but expertise is more often distributed. This means that there is usually a multidisciplinary team. In the courseware,

expert performances were provided in the video clips and active links to resources showing a multidisciplinary approach to patient care. For example, there were links to references and digital libraries exploring the medical and pharmacological care of the patients. This also allowed a more holistic view of caring for the patient.

Multiple perspectives

Students were exposed to multiple perspectives from within (amongst nurses) and with other health care team members. The links to references also provided perspectives other than that of the teacher or the authors of the courseware. Authentic tasks provided the opportunity for students to examine the task from different perspectives, using a variety of resources (Herrington et al., 2010).

Collaborative learning

Collaboration provides many benefits for students in problem solving, reflection and articulation (Herrington et al., 2010). In the courseware, collaboration was encouraged through group activities. Students were asked to share their assessments of the patient and plans of care. They were then encouraged to comment on each other's work to come up with a group plan for the care of the patient.

Reflection

Some tasks in the courseware enabled students to reflect on what they have learned in the care of the patient. They were also encouraged to share their reflections in the discussion forum that can be read by everybody in class. This supports Herrington et al.'s (2010) recommendations that in an authentic learning environment, reflection is not only a quiet and solitary pursuit but also involves social decision making, where students collaboratively decide on the best approaches to achieve their goals.

Articulation

In the courseware, students were given the opportunity to share their reflections with the group and discuss their nursing care plans during ward conferences. This allowed them to have the opportunity to articulate and present their argument in defence of a position, which is a requirement in authentic learning (Herrington et al., 2010).

Learning support

Coaching and scaffolding were provided by the faculty-in-charge. The faculty prepared guide questions to help students explore the case scenarios and better plan their patient care. This supports Herrington's principles that asking further questions rather than giving students the answers helps students at a metacognitive level.

Authentic assessment

Students were asked to submit an electronic portfolio (e-portfolio) that contains their performance checklist, personal reflections, review of journal articles, and nursing care plan. These products were the result of the tasks given to them in the clinical practicum. They were based on the learning objectives set at the beginning of the course. They were also aligned with the case scenarios and tasks given in the courseware. This allowed students to reflect on the actual roles of nurses in the real world or in the hospital setting.

Experience of students in using the multimedia courseware

Fifty per cent of students enrolled in the course submitted a complete evaluation of the courseware. Students who participated in the survey were mostly female (65%). Most of them work in hospitals (65%), followed by those who teach in nursing schools (27%), and those who work in the community (8%). A majority of the students were based in the Philippines (61%) and the rest work abroad. In terms of gender and place of work, the sample is representative of the student population enrolled in the course. However, there were more students based abroad who are included in the study (39%) compared to the actual proportion in the student population enrolled in the course (20%). This is actually an advantage since students based abroad need the orientation to the clinical practicum more. It is possible to have varied nursing practice and nursing experience in different settings. The courseware would help to ensure that all students achieve the learning outcomes regardless of the place where they are doing their actual clinical practicum.

Results of the survey showed that all students found the case studies presented in the courseware useful. They stated that the case studies are similar to the actual cases seen in hospitals and provide realistic scenarios. They also said the various formats - videos, graphic images, audio, and text - engaged them fully in the courseware. The completeness and richness of information in the virtual courseware allowed them to plan their patient care better. This also made them reflect on what they would do in actual situations when faced with different types of clients as presented in the courseware.

Specifically, they commented that the courseware was useful in: (1) preparing students in conducting nursing history and physical examination, and reviewing laboratory or diagnostic tests; (2) guiding students in formulating nursing care plans and using drug studies; and (3) providing information on how functional assessment should be done. The courseware also presented the nursing process as a systematic, continuous, and interrelated problem solving process. This was highlighted in the comment of one of the participants, who said "*Basically, the virtual clinical environment highlights the integration of concepts in advanced adult health nursing.*" This response signifies the extent to which the courseware influenced the way the participants think.

The courseware also helped stimulate critical thinking as reflected in the following statement from one participant *"It also provides an opportunity to develop and practice my critical thinking abilities in a way that it does not jeopardise patient safety."* This supports Antonietti et al. (2008), who state that there is an improved logical thinking among those who have been exposed to multimedia presentations.

In terms of the different elements in the courseware that supported learning, students claimed that: (1) the simplified questionnaires helped them learn how to arrive at correct nursing diagnoses; (2) the videos were informative and provided important details to help in the performance of the learning activities; and (3) the examples and templates helped in the preparation of the student portfolio. One student claimed that the courseware helped a lot in preparing her for the clinical practicum by providing a comprehensive example on how she should approach the actual clinical practicum. Another student stated that it helped him gain confidence in dealing and communicating with patients because the videos showed what to expect in an actual setting. Some students said that available resources and guidelines also helped them in doing the assignments. Since the courseware comes in portable format, other students mentioned they could carry it with them everywhere and could easily play again the parts they needed to review.

CONCLUSION

The multimedia courseware used in this study was shown to have the elements of authentic learning experience as detailed by Herrington (2006) and Herrington et al. (2010). These elements include authentic context, authentic activities, expert performances, multiple perspectives, collaborative learning, reflection, articulation, learning support and authentic assessment.

Students found the multimedia courseware very useful because it; (1) shows the scope of the clinical practicum; (2) illustrates the clinical practicum setting; (3) details patient assessment and care processes; and (4) stimulates critical thinking and decision-making.

Learning was authentic in the sense that it provided scenarios very much similar to actual cases in hospitals and the learning tasks allowed them to apply concepts in the real world, reflecting actuals roles and tasks of nurses in a hospital setting. The multimedia formats - videos, graphic images, audio, and text - also allowed better engagement of the students with the course. The completeness and richness of information in the virtual courseware allowed them to plan their patient care better. This also made students reflect on what they would do in actual situations when faced with different types of clients. Authentic learning made the learning experience of the students more meaningful and relevant. The use of the multimedia courseware allowed students to have authentic learning addressing the challenges of distance, difficult tasks and lack of access to resources.

Future studies could be done to check how students perform in the actual clinical practicum to verify whether the multimedia courseware did indeed help in preparing them for the real-life setting of a hospital. This would also provide feedback on other authentic activities that can be incorporated into future multimedia courseware in nursing.

REFERENCES

Antonietti, A., Colombo, B., Schnotz, W., Moreno, R., Marley, S., Helak, J., & Scielzo, S. (2008). Metacognition in understanding multimedia presentations. *Learning Sciences Proceedings*. Paper presented at International Conference of the Learning Sciences ICLS 2008, 23-28 June 2008 (PART 3 ed., pp. 166-173). Netherlands.

Carlson, A. (2002). *Authentic learning: What does it really mean?.* Washington, USA: Center for Instructional Innovation and Assessment, Western Washington University.

Herrington, J. (2006). Authentic E-Learning in higher education: Design principles for authentic learning environments and tasks. *ELEARN 2006: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education Proceeding.* Paper Presented at AACE World Conference, 13-17 October 2006. Honolulu, Hawaii, USA.

Herrington, J., Reeves, T., Oliver, R. & Woo, Y. (2004). Designing authentic activities for web-based courses. *Journal of Computing in Higher Education, 16* (1), 3-29.

Herrington, J., Reeves, T. C., & Oliver, R. (2010). *A guide to authentic e-learning.* London and New York: Routledge.

Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development, 48*(3), 23-48.

Hummel, H.G.K. (1993). Distance education and situated learning: Paradox or partnership? *Educational Technology, 22*(12), 11-22.

Lombardi, M. (2007). Authentic learning for the 21st century: An overview. *Educause Learning Initiative Paper 1*.

McKenzie, A. D., Morgan, C. K., Cochrane, K. W., Watson, G. K., & Roberts, D. W. (2002). Authentic learning: What is it, and what are the ideal curriculum conditions to cultivate it in? HERDSA 2002: *Research and Development in Higher Education Proceedings.* Paper presented at Supplement to the HERDSA Conference, 25, 426-433.

Tripp, S. D. (1993). Theories, traditions and situated learning. *Educational Technology, 33*(3), 71-77.

Wiggins, G. (1998). *Educative Assessment: Designing Assessments to Inform and Improve Student Performance* (pp 21-42). San Francisco: Jossey-Bass.