

Promoting Reflection through Action Learning in a 3D Virtual World

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Abstract—An international cooperation between educators in Australia and the US has led to a reconceptualization of the teaching of a library science course at Appalachian State University. The pedagogy of Action Learning coupled with a 3D virtual learning environment immerses students in a social constructivist learning space that incorporates and supports interaction and reflection. The intent of this study was to build a bridge between theory and practice by providing students with a tool set that promoted personal and social reflection, and created and scaffolded a community of practice. Besides, action learning is an educational process whereby the fifty graduate students experienced their own actions and experience to improve performance.

Keywords—action learning, action research, reflection, metacognition, virtual worlds

I. INTRODUCTION

DURING the online components of a library science course at Appalachian State University, opportunities afforded by the 3D world maximize social presence, while minimizing transactional distance [1] between learners and instructors. The Action Learning pedagogy was implemented in four sections of library science course titled, *The School Media Program*. Action Learning is a learning strategy that involves a cycle of explore - plan - act - reflect. It was developed by Reg Revans in the 1930s and is used widely for adult learning in business and government and for training on issues ranging from leadership development to environmental action. It uses implementation during learning to bridge the knowing-doing gap [2]. Within a social reflection process that uses scaffolding such as question starters and protocols, the teacher taps into a wider pool of experience not for ideas but for questioning values and beliefs, practices and understandings as well as the new content presented in the course.

Fifty graduate students participated in the course, each identifying a significant challenge or problem to address. Utilizing core learning episodes, reflective journals, and learning sets, students developed an Action Learning plan to systematically explore, plan, act, and reflect. At the end of the semester, students wrote summative reflective papers, referred to as the Assessment Task. This final reflection provided students an opportunity to think about who they are as an

educator, how they came to be that person, what they ultimately accomplished with their projects, and where they intended to go next with their learning and action.

A 3D immersive environment was used to support communication and collaboration among the students enrolled in the course. This virtual environment provided access to tools and resources necessary for the successful completion of the students' action learning projects and, more importantly, offered an immersive learning space in which improved presence contributed to the students' social construction of skills and knowledge. Descriptions of a 3D web-based learning environment (Appalachian Educational Technology Zone or AETZone) have been noted in other research [3]-[4]-[5].

The virtual world exists on an Activeworlds, Inc. universe server hosted at Appalachian State University and provides a three-dimensional space in which students adopt an avatar to move through the space and interact with others in real time using a text-based chat tool. Other tools are incorporated into the world, including blogs, discussion boards, wikis, web pages, library databases, and audio chat rooms, providing students a plethora of ways to participate and engage in a learning community of practice. A central plaza called the Commons has been developed around which a variety of buildings have been constructed to provide access points to tools and resources, and spaces for interactions and collaborations (Figure 1). Students' ability to see other avatars and interact with them (talk, walk, greet, etc.) encourages serendipitous interactions and promotes a greater sense of presence and co-presence than other text based learning management systems.



Fig. 1 The Commons

Our College of Education's conceptual framework serves as a guide for the teaching and learning that occurs within the college and subsequently, in the virtual world. This framework

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is based on five assumptions supported by a rich theoretical and research base in the area of social constructivism [6].

- Learning occurs through participation in a Community of Practice;
 - Knowledge is socially constructed and learning is social in nature in a Community of Practice;
 - Learners proceed through stages of development from Novice to Expert under the guidance of more experienced and knowledgeable mentors in the Community of Practice;
 - An identifiable knowledge base that is both general in nature and also specific to specialties emerges from the Community of Practice;
 - All professional educators develop a set of Dispositions reflecting attitudes, beliefs, and values common to the Community of Practice.

The 3D Action Learning environment we have created supports the five assumptions of our college's conceptual framework about teaching and learning. It provides a space in which community can be formed and nurtured. Students know and can see when their colleagues are logged into the world. They can walk up to another and talk to them about life, work, or the latest news. Through these interactions, both planned and serendipitous, students begin to create knowledge together. They talk about the work they are doing in class, they share ideas, processes, and resources with one another and contribute to the base of knowledge that exists in their field. Throughout this process, they move from novice to expert, both in terms of knowledge and skills, but also in terms of their abilities to work collaboratively and inside a virtual learning environment using tools previously unknown to them. Their beliefs about teaching and learning are challenged, refined, and shaped by the process of learning together in an authentic social world of dialogue and discovery.

Interviews, observations, document analysis, and surveys were used to collect and analyze data in order to answer the research question, "How can we bridge the gap between theory and practice in a university course while developing reflective professionals and lifelong learners?" These data provide a rich description of the students' process of planning, acting, and reflecting, and suggest how this process can be used to develop best practices, refine theory, and develop critical thinking skills.

II. REVIEW OF THE LITERATURE

A. Action Learning

Graduate education is less about memorizing facts, statistics, and theories, and more about bridging the gap between theory and practice by learning various strategies appropriate for the application of knowledge in the workplace. Higher-level skills of Bloom's taxonomy are more desirable than simple recall and understanding. In fact, most educators would agree that a deep learning approach, one in which students work toward achieving meaning and understanding, is more desired than recitation of information [7]. Students who are more engaged in and responsible for learning through a more active approach are able to experience a deeper level of learning than those who are passive recipients of what is being taught [7]. Bonk, Kim, and Zeng suggest that a more active approach to learning, involving problem-solving, authentic

learning experiences, virtual teaming, and online collaboration, will eventually replace more conventional, didactic approaches to learning [8]. Bonk and Zhang (2006) add that along with this shift will come a greater emphasis on reflection for students to "internalize and expand upon their learning pursuits" [8, p. 258]. Action learning has been cited as one pedagogical approach that can be used to provide learners with an opportunity for these deeper and richer learning experiences.

Action Learning is "based on a process of people learning by attempting to design and implement solutions to their problems" [9, p. 472]. O'Shea adds that it is an "approach to learning by using personal experience and reflection, group discussion, and analysis, trial and error discovery, and learning from one another" [10, p. 87]. The process of Action Learning involves the reflection by learners on new data gathered in the context of a problem, action emerging from these reflections, and further reflection on the results of this action [10]. While student response and ability to engage in the Action Learning process may vary, Wilson and Fowler's study (2005) suggests that Action Learning can help students who are generally more "surface learners" use strategies in their learning that are usually associated with deep learning [7].

Action Learning utilizes, among other things, small groups of learners working together in what are referred to as "learning sets." While students are sharing, collaborating, and participating in an ongoing process of social reflection within these learning sets, each member of the set works through the Action Learning process in the context of his or her own distinct project. While collaborative, the learning set is not necessarily working on a group project. Rather, Action Learning's use of learning sets made up of the learner's colleagues is key to supporting and facilitating the reflective practices necessary for learning [9]. Building trust among the learning set, in particular when it's conducted virtually, is a vitally important to the team's ability to function (Marsh & Johnson, 2005). Without this trust, learning set members are acting alone and limited in what they can accomplish toward their respective projects. The process of working with the set members is an integral part of the Action Learning process. Without this, learners are simply working alone on a project with the sole purpose of producing results.

Marsh and Johnson [11] caution, "conscious engagement in the learning process needs to become as important to the participants as delivery of results." They continue, "The accomplishment of results that the action produces is a byproduct, not the goal of action learning" (pp. 243-244). It is, therefore, vital that the process oriented components of Action Learning, including participation in learning sets and maintaining reflective blogs must not be overlooked when planning an Action Learning project.

B. Reflection and Metacognition

Action Learning has two types of reflection - personal (journal or blog) and social (the learning set) and it is the combination that takes it beyond reflective teaching. Both types of reflection are integral to the Action Learning process and, as noted above, are more important to the process of Action Learning than the actual products developed. The structure of the Action Learning experience, in the form of a

graduate course, a workshop, or otherwise, includes reflective activities and a means of assessing these activities. Wilson and Fowler [7] note, "The extent to which students actually engage in critical reflection in large part depends on the extent to which the assessment methods employed have developing deep understanding (a defining aspect of the deep approach to learning) as their goal" (p. 91). It is therefore important assessment tools utilized in the context of the Action Learning process be aligned with the activities and processes provided in the context of the project undertaken by the learner.

Reflection is a key element of deep learning and is included as one of Kolb's four phases of effective learning, consisting of reflective listening and observations [8]. Norton and Owens' [12] research examines learners' reflection on the process of learning, labeling it as "metalearning" and defining it as "an awareness and understanding of the phenomenon of learning itself as opposed to subject knowledge" (p. 423). Boud and Walker's definition of reflection as a metacognitive activity is similar to Norton and Owens' definition of metalearning in terms of its focus on relating new information to prior knowledge, building connections between theory and practice, validating ideas and feelings, and personalizing knowledge gained [13]. Lizzio and Watkins [9] add that these metacognitive skills are actually enhanced and developed through learners' use of reflective practice in authentic work environments.

Reflection is a learned skill and students often experience initial challenges and anxieties related to the reflective process, especially if they consider themselves to be poor writers or if they are unfamiliar with the techniques used to generate reflective thoughts and ideas. They also struggle with reflective writing if they have not had prior opportunities to develop metalearning skills or strategies. Kember conducted a study in which he found that students who approached learning from a the more conventional and didactic approach mentioned earlier find metalearning and the ability to modify one's own behavior as a result of this self-awareness a difficult process [12].

Despite these obstacles, reflection is a necessary skill that must be learned if students or employees desire to experience deep learning. Schon argues that reflection is an important process in terms of learners' ability to negotiate the complexities of a professional work environment [13]. Lizzio and Wilson [9] cite studies by Marsick and Watkins, and Sternberg and Horvath, adding, "much professional or workplace relevant learning is rarely developed through formal or didactic means, but in informal, reflective and interactive episodic contexts" (p. 470).

III. METHODOLOGY

Of the 50 graduate library science students enrolled in a course titled The School Media Program taught at a mid-sized Southeastern university, 35 students chose to take part in this study. The course was taught by the primary investigator of this paper using Action Learning pedagogy in both a face-to-face classroom environment and through the use of a 3D immersive world. As such, students were required to develop a project focused on exploring a problem or issue toward which to take action. Each student was assigned to a learning set to

serve as a support group and sounding board for the students, and expected to engage in a social reflection process supported by deep questioning techniques developed and scaffolded throughout the project. All students were required to meet (both face-to-face and/or online via discussion boards or text/audio conferencing) with their learning sets to share challenges, questions, and successes. Students were also asked to post a reflective narrative once a week to a blog made available in the 3D world. This blog served as a means of personal reflection documenting the work the students completed with regard to their respective projects.

A survey designed by the two authors of this paper was provided via a survey tool in WebCT. The survey consisted of a letter to the students explaining the purpose of the study and 16 questions regarding each student's experience in the course, with the Action Learning approach, and with the use of the 3D world itself. The investigator transferred the survey responses to an Excel spreadsheet for the purposes of examining and analyzing the survey data. These data were then combined with the data collected through interviews, observations, and course documents, and triangulated to help in answering the following three research questions:

- How did Action Learning change the way you think about teaching and learning?
- What role did reflection play in the learning process?
- How have you changed as a result of this course? To what aspect of the course do you attribute this change?

IV. RESULTS

Research Question 1: How did Action Learning change the way you think about teaching and learning?

Overall, students found the Action Learning pedagogy to be very different from what they have come to expect from a graduate course. With its inherent focus on student initiated engagement in a project and its emphasis on collaboration and reflection, the Action Learning approach contrasts with the more traditional didactic approach often used in graduate education.

Students who responded to the survey questions noted the importance of reflection in the Action Learning process. They saw a direction connection between reflection and the acts of teaching and learning. School districts are beginning to desire both students and teachers to engage in more reflective practice. One student noted that she would explore Action Learning further as a method of teaching to provide a context for this reflection in her own classroom. Another added that the reflective nature of Action Learning encouraged her to ask more questions and subsequently, help other students find their own answers. Others echoed these points and the desire to engage in more reflection and commented on the value that they placed on reflection in terms of understanding themselves as teachers and media coordinator.

One student described the Action Learning process as taking a, "Stop and smell the roses attitude. Don't rush, access you thoughts and ideas, them implement. Spend time." The focus of Action Learning is not necessarily on covering as much content as possible within a finite amount of time.

Rather, Action Learning supports learning during the implementation of course content in the context of the workplace by focusing on a specific problem or issue through "hands on activities, group projects, new experiences, lots of reflection, shared insight of "real life" situations and increased retention of what has been learned through experience."

Research Question 2: What role did reflection play in the learning process?

Responses from students regarding the role of reflection could be categorized in three ways. Some comments focused on the role of reflection in terms of the clarification of thoughts and ideas. Other students talked about reflection in a means of becoming more self-aware. Finally, others talked about reflection as a safe way to be honest in their expression of ideas.

A. Clarity of Thought

Students found that the reflection component of the Action Learning process provided them a means of clarifying and organizing their thoughts regarding their respective projects. One student noted, "The reflective journal/blog helped me reflecting back on what I had done. It was like I was reviewing what I had learned, which helped me to have a clearer picture in my mind and it was embedded in my mind." Other students added, "It gave me a place to iron out my thoughts relating to education and the media center..." and, "My journal gave me a way to get my ideas, plans, and actions clarified in my own mind." The comment, "[It was a] great way for me to express my own ideas, concerns, etc and be able to read over what I wrote. I liked reading the other blogs and see how my classmates were feeling as well," also suggests that the social potential of the reflective blogs were appreciated by students and helped students clarify their own ideas by reading what others had written.

Students also found that reflection provided a means of trying out new ideas without criticism or the need to have immediate justification for what they were writing. "The reflective journal/blog provided a space where I could write personal subjective thoughts that didn't require justification." Another noted, "This was my favorite part of the process. I could ramble until my thoughts came together." Another student wrote, "It helped me see my thinking on paper or computer screen." Other forums for writing (formal papers, email, discussion boards, etc.) did not provide students with the same sort of opportunities to flesh out ideas or work through preliminary thoughts on a topic.

One student summed up the value of reflection in noting that, "Reflecting on a course or any aspect of your life is an activity that you have no idea how much you are getting out of it until you've completed it." This last statement regarding the clarifying value of reflection also suggests that there is an additional value in students developing self-awareness and a better understanding of themselves as learners.

B. Self-Awareness/Understanding

Students saw how reflection helped them in growing and learning. One student stated, "It kept me thinking about where I was in the learning process, what I needed to do, and where my strengths and weaknesses were." Another shared a similar

perspective adding, "It helped me reflect about successes and failures, and helped me see a different point of view and come up with different ideas, that otherwise I may not have thought about. Reflection is a big part of learning because it helps a person to see where they came from and where they want to go."

Students also commented on the specific role that reflection played in this learning process. One student noted, "It gave me an opportunity to process the information and discussions while providing a chance reflection on the information. It really was cyclic because reflection usually breeds questioning." These questions could then be used to drive further reflection and self discovery, or serve as a means of promoting dialogue with learning set members in the discussion boards, in class, or in the text/audio conference spaces.

C. Honest Expression of Ideas

As stated earlier, the reflective blogs provided students with an opportunity to experiment with ideas and elaborate on thoughts that they could not yet rationally justify or explain. As one student put it, "It was a nice way to be honest with myself and know that I wasn't being criticized for what I had to say." Another student noted, "It helped me sort out my thoughts. It provides a chance to vent frustration and meditate on your next step. It is a good way to focus thoughts related to your project instead of just rolling it around in you head."

As this student mentioned, the reflection also served as a place for students to "vent" or share frustrations they were having about their projects or with the Action Learning process itself. One student shared, it [the blog] was a great place for me to vent/reflect/sum up/question things that were going on with my project and the course. [It was] hard to get used to it being just for my purposes and not only for my instructor to read... [I] felt like I could speak truthfully and not have to b.s. anything to make it sound like I cared about what was going on." Other students supported this sentiment adding, "It was a great place to vent frustrations and reflect on accomplishments" and "It was like blowing off steam and it made me put my thoughts in order."

Research Question 3: How have you changed as a result of this course? To what aspect of the course do you attribute this change?

In terms of the third research question regarding the changes noted by students, there was consensus among them that reflection played a major role in any changes they experienced. As one student put it, "I saw firsthand how rewarding it is to have so many "a-ha" moments during an intense period of self-discovery." In some cases, these moments were subtle and stated in terms of a new confidence in what students planned to do professionally. One student noted, "I feel more secure in who I am and who I will be as a media coordinator. The reflection led me to this conclusion." Another added, "I know what kind of librarian I want to be and what my vision of the library media center is. I attribute these changes to the Action Learning process, the learning portfolio, assessment task, blogs, and discussion boards."

Another way in which students changed was in terms of how they intend to approach future challenges and projects. "I

have started reflecting more on tasks. Which is a result of learning how reflection can help in retaining the information and reflecting back on exactly what was learned." Others stated, "I reflect more about what I'm learning, or could be learning, from each class" and, "I now think about why I do the things I do - this has helped me be a better educator." Not all these changes or discoveries were evident to the students at first. As one student put it, "I don't think it really dawned on me until the end of the class when I completed my assignment and read the final classmate blogs... that it was all pretty much up to us to make this class what it needed to be to meet our personal needs."

Evidence of the sort of growth that many students experienced during the course was summed up in the following statement shared by one of the students: "All the activities and experiences in this class prompted reflection at some level and this was the catalyst for all that I learned. The more I did - the more I learned. I experienced a lot of growth in this course that I found within myself"

V. DISCUSSION AND CONCLUSIONS

Action Learning is more than the initiation of some action to address an identified problem. The definition of the process of Action Learning certainly includes *action* but also includes exploration, planning, and *reflection*, with *reflection* taking place not as a discrete part of the process but rather as an activity that is done in the context of the other three components. It might even be argued that reflection is the most important component of Action Learning in that it is only through this reflection that students learn and can make sense of the work they conduct in the context of their Action Learning *project*.

The important role that both personal and social reflection plays in the Action Learning process is clearly evidenced in the data results shared above. The Action Learning process provides students with a meaningful context on which to reflect in similarly meaningful ways. While reflective writing has been a commonly used instructional activity, the students' comments suggest that they have had little, if any, expectations for doing reflective writing in their academic career. Furthermore, prior reflective practice was often conducted in the context of less than authentic activities. It may be that the authentic nature of Action Learning, due in large part to the students' choice of topics and issues, motivates students to take reflection seriously and view it as a worthwhile and meaningful learning activity as opposed to another assignment they have to complete for a grade. Action Learning's inclusion of reflective practice seemed to help students engage more fully in their respective projects and in working with other students in the class around these projects.

The complexity and changing nature of their projects made it difficult at times for students to commit to a single plan of action. The reflective process provided an opportunity, however, to take a snapshot of where they were in their projects, what they had already accomplished, and what they had yet to accomplish. Sometimes, students found that their projects were proceeding as anticipated. However, many times students found that the projects had changed and that new ideas, questions, and requirements emerged out of these

changes. Reflection provided students with some clarity and stability in spite of the changes and offered a safe forum in which they could vent frustrations and question the value of the projects and processes. While these feelings of anxiety and frustration created temporary blockages in the students' ability to work on their projects, periods of clarity and focus followed once students were allowed to work through these issues and problems in their reflective blogs and in their learning sets.

Ultimately, the data suggests that Action Learning provides students with access to relevant content and expertise in the context of an authentic work environment, and a set of reflection tools and processes to help students move beyond the simple recitation of facts and figures typical of more surface level learning. The personal and social reflective practices inherent in the Action Learning cycle engage students in a thoughtful and meaningful learning experience in which theory can be put into practice, enabling learners to become lifelong learners. Action Learning, and the components embedded in the process (including reflection) went from something they had to do to complete the course, to something that they wanted to and enjoyed doing.

While the findings of this study were encouraging in terms of the value of reflection in the context of teaching and learning, it is unclear as to the explicit role that the Action Learning process might have had in affecting the nature of this reflection. Reflection can be and has been done without introducing the Action Learning process. What role or impact does Action Learning have then on the changes experienced by the students in this course as a result of their reflective process? Would they have had the same experience keeping a reflective journal in the context of some other pedagogical approach? What value do students place on personal reflection vs. social reflection? And, while not specifically addressed in the research questions presented in this study, there is little connection between the nature of the reflective process and the technologies used to manage these reflections. It does seem apparent that Action Learning provided a context in which reflection could take place in a meaningful and productive way and that the 3D immersive technologies used provided a simple way for students to maintain a reflective journal that could be shared with the instructor and among those enrolled in the course. And, while no students expressed concerns regarding the shared nature of the reflective blogs, further research is needed to understand the impact this public nature of the reflective blogs had on students' willingness to be honest and forthcoming in what they wrote.

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