Instructional Design for the Training of PBL in ALC

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Overview of Background

In his letter to the faculty of the University of Oklahoma (2012), President David Boren stated that, “When distance is not a consideration, we should not adopt technology to replace classroom learning but, rather, we should use new technologies to enhance the overall educational experience for our students.” “We must challenge ourselves to use technology, through videos and dynamic on-line course materials, to make more time available in the classroom/laboratory for discussion, student engagement, hands-on experiences, active peer learning and undergraduate research.” “Our role as a leader in the implementation of emerging technologies and commitment to dynamic classroom instruction will distinguish our digital initiatives from those of our peers.”

As a part of the digital initiative, in fall 2012, students started to experience the first set of classes offered in the new Active Learning Classroom (ALC) in the Stephenson Research Center at the University of Oklahoma. An ALC is a classroom with technology-enhanced learning space to promote student-centered learning. It is equipped with six large round tables, two large LCD screens and six smaller LCD screens. With cable connections, each table can accommodate ten students. Located in the center of the classroom, the podium gives professors control of all LCD monitors.

The promotion of ALC aims to facilitate student engagement and collaborative learning by taking advantage of technology and classroom features so that they can apply what they learn in classroom to solve real world problems. It requires a shift in teaching method from the teacher-centered approach to the student-centered approach. Since
several professors have already facilitated their classes in the ALC so far, we had the chance to observe some of the classes. We found that some professors were unable to fully utilize the advantages of the ALC to encourage student engagement or active learning. With further analysis, we believe that training on how to facilitate student engagement and collaborative learning in the ALC is necessary.

**Needs Analysis**

The goal of needs analysis is to identify the knowledge, skills, and attitudes necessary for the professors to facilitate active learning in the ALC, to identify the professors’ capacity to achieve the desired outcomes as well as their motives for doing the tasks, and to identify the factors that influence the transference of the learned knowledge and skills to their classrooms.

**Problem Statement**

It is of vital importance to analyze Professors’ prior knowledge and skills about student-centered learning and technology-enhanced learning since they greatly influences the effective use of the ALC.

**Issues in facilitating student-centered learning.** Educational practice is paying more and more attention to advancing skills for knowledge creation and collaboration, which is supported by problem-based activities that simulate the practices of professional or scientific communities (Carey & Smith, 1995). Student-centered approaches especially Problem-Based Learning (PBL) has been the focus of many developments in teaching and learning facilitation in recent years. It has been claimed that PBL produces independent learners who are motivated, engaged in deep learning, work as a team, and
develop effective strategies, skills and knowledge for life-long learning and professional work (Uden, 2005).

However, the university teaching is still dominated by traditional teacher-centered approach. Neil and Anna (2006) conducted a national survey with regard to the use of learner-centered approach. This study involved 329 professors from land-grant universities and state colleges. 85% of the professors in the study worked at research institutions, and 69% were tenured at the time of the survey. According to the result of the survey, half of the faculty thought they had been using problem-based learning quite a bit and always. Based on their analysis, Neil and Anna (2006) concluded that the faculty probably taught using “problems” to help students apply and learn the content, but they may not have been using the problem-based learning approach grounded on constructivist assumptions that engage students to inquire into an ill-structured problem that sustains interest and learning for several weeks. Professors who utilize problems in their courses might think that they are utilizing inquiry learning, when they are in fact implementing a more teacher directed problem-solution approach.

While the concept of PBL is not new to some university professors, they are faced with challenges in putting the pedagogical approach into practice, because it is hard to develop a problem or set of problems that address specific learning objectives while at the same time authentically reflecting on the needs and activities of the workplace and profession (Dunlap, 2008). Neil and Anna (2006) suggested that teacher development programs should focus on helping professors to understand the assumptions of using various teaching methods and their learning benefits. Graduate students and professors should be provided with assistance with regard to how to use learner-centered approach.
Since many professors are not really using the pedagogical approach of PBL, they are unlikely to see the usefulness of ALC in facilitating active learning. Professors lack necessary knowledge and skills to develop and implement PBL. There is a need to help professors to develop their PBL pedagogical practice with taking into account the technological tools available.

**Issues in facilitating technology-enhanced learning.** Computers and web-based technologies are increasingly applied in teaching and learning, especially as tools for social interaction, inquiry activities and collaborative working with knowledge (Winn, 2002). The use of technology in ALC provides possibilities and convenience to promote PBL. With effective technology integration in classroom, learning will be enhanced and students will be more engaged (Overbaugh & Lu, 2008).

However, as grand efforts and large budgets have been dedicated to constructing technology-enhanced learning environment, there are many cases that those technological tools remain idle. Wozney, Venkatesh, & Abrami (2006) surveyed 764 teachers and found that only 11% of them used technology for expansive functions such as experiments, exploration, or brainstorming. Effective use of technology does not necessarily happen just because the technology is available. Both knowledge of the technology and practice using it for instructional purposes are necessary for successful implementation (Potter & Rockinson-Szapkiw, 2012).

As a part of digital initiative, the University of Oklahoma will encourage more and more professors to use ALCs. It would be a waste of resources if an ALC does not play its positive role in facilitating student engagement and active learning. Therefore, it
is of vital importance for us to analyze the causes for the possible ineffectiveness in the use of ALCs and provide sound solutions accordingly.

**Conclusion.** Effective use of ALCs could enable student engagement and collaborative learning. However, based on the problems concluded from existing studies, the professors’ lack of knowledge and skills in facilitating PBL and technology-enhanced learning pose potential risks to the use of ALCs. Therefore, there is a need to design and develop sound instruction for teachers on how to facilitate PBL and technology-enhanced learning in ALCs to enable student engagement and collaborative learning and avoid the waste of resources.

**Learner Analysis**

The learners for our instructional design are professors who are going to use ALCs at the University of Oklahoma. The important characteristics of professors as learners for our instructional design include their prior knowledge relevant to technology-enhanced learning and PBL, their perception toward the use of technology-enhanced learning and PBL as well as their motivation in using them.

**Professors’ prior knowledge of technology-enhanced learning and PBL.**

While some professors may clearly understand the essence of PBL, Neil and Anna (2006) suggests that many others may not know or use the problem-based learning approach grounded on constructivist assumptions that engage students to inquire into an ill-structured problem that sustains interest and learning for several weeks.

According to Academy of Distinguished Teachers (2002), few professors have actually been taught how students learn and how to best teach their students. In absence
of a solid knowledge of research in the newest teaching strategies or solid training in effective educational practices (Theall, 1999), professors organize and teach their content based on their academic disciplines, personal beliefs and backgrounds (Stark, Lowther, Ryan, Bomotti, Haven, & Martens 1988).

Due to professors’ lack of understanding in learning theories and PBL, in our design of trainings, we need to clarify the definition of PBL, its theoretical root and its influence on learning and teaching before we introduce our pedagogical model based on PBL.

**Professors’ perception toward technology and PBL.** According to Inan & Lowther (2010), instructors’ perceptions about technology and attitudes toward utilizing technology have a direct effect on technology integration. Studies have shown that the most significant predictor of using technology in the classroom was personal experience with technology outside the classroom (Wonzney, Venkatesh, & Abrami, 2006). The result of the survey conducted by Wozney et al. (2006) indicates that many teachers didn’t see the advantages of technology in teaching, and they didn’t know what changes and benefits technology would bring to their teaching and their classroom activities. Therefore, it is necessary to help professors who are unaware of the advantages of the technological tools in ALCs to experience its functions, so that they could change their perception toward ALCs.

In PBL, the teacher is the facilitator or coach who guides students to explore and construct their own knowledge. Using PBL in the classroom requires a shift in thinking for teachers who believe they are the dispensers of knowledge. The findings from the survey conducted by Neil and Anna (2006) implies that the way faculty think and feel
about teaching and student-centered approach is likely to influence what they do in their courses.

Professors’ perception about the use of technology and PBL are important for the promotion of ALCs. Acquiring more knowledge about technology-enhanced learning and PBL will affect professors’ perception toward teaching and learning, thus enable them to use ALCs more effectively.

**Professors’ motivation in using student-centered approach.** According to Scarlett (2004), the nature of faculty work includes balancing the pressures of teaching, conducting research, and accruing academic tenure or promotions, which could undermine the importance faculty place on effective teaching practice. Professors are expected to be scholars in their disciplines, but not necessarily scholars of teaching and learning. Neil and Anna (2006) believe professors’ views of teaching and learning and motivation in using student-centered approach influence their teaching methods.

Professors who are using PBL in traditional classrooms are likely to be motivated in using ALCs. The use of technology and PBL requires teachers to examine personal beliefs and prior experiences and how these beliefs and experiences may support or inhibit the goal of the learning opportunity (Potter & Rockinson-Szapkiw, 2012). If barriers are identified and discussed, then they may be more likely overcome. Neil and Anna (2006) stated that the expectancy of positive outcomes of teaching as well as the belief that one can accomplish teaching related tasks influences professors’ likelihood to focus time and energy toward teaching related endeavors.
Conclusions. Professors’ perceptions and attitudes toward the use of technology and PBL are important for our instructional design. We should make them aware of the benefits and innovations that technology and PBL could bring to their teaching so that they can be more motivated to use ALCs.

Context Analysis

Tessmer & Richey (1997) defined three types of contexts including orienting context to identify learners’ perception of the training, instructional context to identify the instructional environment factors to be considered such as locations, tools and length of the training, and transfer context to determine the environment that promotes the transference of the training to real world context.

Orienting Context. As we state in Learner Analysis, professors’ perception and attitudes toward the training would be significantly influenced by whether they think or feel the training could bring benefits to their teaching. As Neil and Anna’s study (2006) indicated, if professors truly understand the benefits of PBL, they will embrace the training and be motivated to attend the training actively.

As instructional designers, we should pay attention to this orienting context. In order to take advantage of such orienting context, we need to attract professors’ attention before the training by informing them of the features, innovations and benefits of technology-enhanced learning and PBL in ALCs. To achieve this goal, we may need to develop informational materials that focus on those aspects.

Instructional Context. Instructional context provides information about the physical environment and scheduling of instruction. We propose to hold workshops and
an online community for the training. We need to select locations for the workshops. We believe the factors that should be taken into consideration in the selection of a location include whether it can hold all the learners, whether it has necessary tools to demonstrate the features of PBL, and whether it is the best choice for the transference of the knowledge. Therefore, the ideal location for the workshop would be the ALCs. When professors are situated in an ALC, they will have a much better sense of an ALC, which will make it more effective to introduce its features and functions. Moreover, in a real ALC, the instructor for the training can carry out activities based on PBL while taking advantage of the features of the ALC, which will result in better learner performance through learning by doing in authentic context.

An ALC can accommodate around 60 people. We propose to interact with professors in workshops based on different departments to ensure the effectiveness of the trainings. Another benefit for giving trainings based on departments is that the trainings can be more targeted and customized according to the features of specific departments. However, if the participants are limited to a small number, we may include all of them into one workshop instead of dividing them into groups based on departments.

In the online learning community, whether the learning environment is favorable largely depends on the design features of the community. In view of this, our online community should provide community members with many features such as videos, audios and visuals, forum discussions and so on. Professors can share their experiences as well as learn from each other. Necessary components relevant to the instructional materials and activities of the training will be an important part of the community. Community members should have the autonomy to initiate any learning activities at any
time based on the architecture of the community. Besides, the facilitator of the community should initiate learning activities on a regular basis. For example, he or she may promote discussion and reflection by posting topics, themes or questions.

**Transfer Context.** Transfer context focuses on the opportunities for transferring the knowledge and skills to new situations. Some of the professors have been teaching for decades using teacher-centered approach. Even if they understand and be able to use student-centered approach, it is still hard for them to change their thinking and teaching methods immediately.

Such context implies that we should design sound instructions to inform professors of the essence of technology-enhanced learning and PBL in ALCs and let them experience the benefits of PBL and ALCs so that they can transfer what they learn to their pedagogical practice. In addition, the online community should also focus on providing meaningful context such as case studies and problems in the real world for professors to collaborate, practice and reflect so that they can apply PBL to the ALCs.

**Task Analysis**

Based on our needs analysis, learner analysis and context analysis, we developed the overarching goal for the training as: Through participating in the workshops and online community, professors are able to apply PBL approach to teaching in the ALC.

To achieve the goal, we developed following objectives. Through the training, the professors are able to:

1. Recognize the benefits of PBL in the ALC.
2. Design problems for PBL environment.
3. Facilitate group work in PBL environment.
4. Facilitate reciprocal teaching in PBL environment.
5. Design assessments and evaluations for PBL environment.

Objective 1: Recognize the benefits of PBL in the ALC

   a. Recognize the capabilities required by 21st century.
   b. Recognize the gap between students’ performance and the required capabilities of 21st century.
   c. Recognize the principles behind PBL and constructivist learning environments.
   d. Recognize why PBL can facilitate student engagement and active learning in the ALC.

Objective 2: Design problems for PBL environment.

   a. Differentiate well-structured and ill-structured problems.
   b. Identify appropriate PBL problems given specific cases.
   c. Recognize the factors that influence the design of PBL problems.
   d. Design appropriate PBL problems for specific subject given different scenarios.

Objective 3: Facilitate group work in PBL and ALC.

   a. Recognize the benefits of group work.
   b. Identify inappropriate behaviors that undermine group work.
c. Design activities and question prompts to promote group work in PBL and ALC.

Objective 4: Facilitate reciprocal teaching in PBL and ALC.

a. Recognize the benefits of reciprocal teaching.
b. Apply the strategy of modeling in PBL and ALC.
c. Apply the strategy of coaching in PBL and ALC.
d. Apply the strategy of scaffolding in PBL and ALC.
e. Apply the strategy of articulation in PBL and ALC.
f. Apply the strategy of reflection in PBL and ALC.
g. Apply the strategy of exploration in PBL and ALC.

Objective 5: Design assessments and evaluations for PBL environment.

a. Recognize the differences between assessment and evaluation.
b. Identify how to assess and evaluate student group work.
c. Identify how to assess and evaluate student self-regulated learning.
d. Identify how to assess and evaluate student problem-solving ability.

The learning objectives are focused more on the application level and problem-solving skills. In next part of the paper, we will discuss how to realize these objectives through an instructional design framework.
Theoretical Perspective and Instructional Design Model

As stated in the analysis part, the advantages of the ALC features can be maximized in constructivist learning environments especially Problem-Based Learning (PBL) environment. However, the university teaching is still dominated by traditional teacher-centered approach. Professors have misconceptions about PBL. The faculty probably taught using “problems” to help students apply and learn the content, but they may not have been using the PBL approach grounded on constructivist assumptions that engage students to inquire into an ill-structured problem that sustains interest and learning for several weeks. Professors who utilize problems in their courses might think that they are utilizing inquiry learning, when they are in fact implementing a more teacher directed problem-solution approach (Neil and Anna, 2006).

Furthermore, professors are faced with challenges in putting the pedagogical approach into practice, because it is hard to develop a problem or set of problems that address specific learning objectives while at the same time authentically reflecting on the needs and activities of the workplace and profession (Dunlap, 2008). Neil and Anna (2006) suggested that teacher development programs should focus on helping professors to understand the assumptions of using various teaching methods and their learning benefits. Graduate students and professors should be provided with assistance with regard to how to use learner-centered approach.

Since many professors are not really using the pedagogical approach of PBL, they are unlikely to see the usefulness of ALC in facilitating active learning. Professors lack necessary knowledge and skills to develop and implement PBL. There is a need to help
professors to develop their PBL pedagogical practice with taking into account the technological tools available.

However, the use of technology and PBL requires teachers to examine personal beliefs and prior experiences and how these beliefs and experiences may support or inhibit the goal of the learning opportunity (Stephanie & Amanda, 2012). Professors’ personal beliefs and perceptions toward technology and PBL are hard to change, which poses difficulties for the instructional design of a teacher professional development training regarding the use of PBL in the ALC.

**Theoretical Perspective**

The results of the analysis indicate that the critical factors that will influence the effectiveness of a professional development training regarding the use of PBL in the ALC include the strategies to motivate professors and the instructional activities that will enable professors to apply specific strategies of PBL.

Walker (2004) presented two empirical studies developed from the perspective of a strong commitment to the social nature of motivation. The recognition of the contextual nature of motivation is not new. The notion of the person-in-context has been evident (Pintrich & Maehr, 2001) in motivational research. In sociocultural theories deriving from Vygotsky (1978), human activities, events, and actions cannot be separated from the context in which they occur. This perspective implies that individuals who participate in the learning activities situated in authentic contexts are motivated to learn and become “attuned” to the contexts at the same time (Hickey & Zuiker, 2005).
Based on the social nature of motivation, we believe that an effective way to motivate professors to participate in using PBL approach in the ALC is to situate them in authentic contexts where they can experience the great benefits of PBL and where PBL and ALC are integrated seamlessly.

In proposing their model of situated cognition, Brown, Collins and Duguid (1989) argued that meaningful learning will only take place if it is embedded in the social and physical context within which it will be used. They proposed that one way to achieve authenticity was the model of cognitive apprenticeships, a method designed to enculturate students into authentic practices through activity and social interaction (Brown, Collins, & Duguid, 1989). A critical aspect of the situated learning model is the notion of the apprentice observing the community of practice. As learning and involvement in the culture increase, the participant moves from the role of observer to fully functioning agent (Lave & Wenger, 1991). A situated learning environment should follow the principles as below (Herrington & Oliver, 1999).

- Provide authentic contexts that reflect the way the knowledge will be used.
- Provide authentic activities.
- Provide access to expert performances and the modeling of processes
- Provide multiple roles and perspectives.
- Support collaborative construction of knowledge.
- Promote reflection to enable abstractions to be formed.
- Promote articulation to enable tacit knowledge to be made explicit.
- Provide for authentic assessment of learning within the tasks.
Situated learning is aligned with constructivism. Constructivism is an epistemological belief about what knowing is and how one comes to know. Constructivists believe in individual interpretations of the reality. The important epistemological assumption of constructivism is that meaning is a function of how the individual creates meaning from his or her experiences (Jonassen, 1991). Constructivists suggest that learners should be given the opportunity for concrete, contextually meaningful experience through which they can search for patterns, raise their own questions, and construct their own knowledge. Constructivists also advocate that a community of learners should be facilitated to engage in activity, discourse, and reflection. Constructivists encourage learners to take on more ownership of the ideas, and pursue autonomy, mutual reciprocity of social relations (Jonassen, 1991).

**Instructional Design Model**

By referring to constructivist learning theories, including Collins, Brown, and Newman’s situated cognition theory (1987), our instructional design model identifies the critical aspects of situated learning, translates them into instructional methods, and combines them with ALC features. Refer to Figure 1 for the architecture of the model. The model aims to provide appropriate instructional content, pedagogical strategies, instructional sequence, sociocultural context for the training as well as the integration of ALC features.

In the following part, we will firstly explain each component of the model, and then we will demonstrate how ALC features will be integrated into the instructional design.
INSTRUCTIONAL DESIGN FOR THE TRAINING OF PBL

Figure 1 Instructional Design Model
Content. Collins, et al.’s framework (1987) suggested four aspects of content required for expertise in a domain including domain knowledge, problem-solving strategies, control strategies and learning strategies. They use the term strategic knowledge to refer to the tacit knowledge that underlies and expert’s ability to make use of concepts, facts and procedures as necessary to solve problems and carry out tasks. We adapted their definition of content by including domain knowledge, problem-solving knowledge and monitoring knowledge.

Domain knowledge includes the conceptual and factual knowledge and procedures explicitly identified with a particular subject matter (Collins, et al., 1987). In our workshop, domain knowledge includes epistemological beliefs, learning theories, instructional design theories, the concept of PBL, the knowledge of ecology and affordance, and learning spaces. This kind of knowledge is important but not enough to provide clues for the participants about how to actually apply PBL approach in ALCs. When learned in isolation from realistic problem contexts, domain knowledge tends to remain inert. It is only through encountering them in real problem solving that the participants will learn the conditions and strategies for applying PBL in ALCs.

Problem-solving strategies are generally effective techniques and approaches for accomplishing tasks that might be regarded as tricks of the trade (Collins, et al., 1987). Problem-solving strategies are extremely important for the participants to apply PBL in their classrooms in the future. Understanding the concept and principles of PBL and recognizing the features of ALCs are far from enough for the participants to be able to apply them to real world. Therefore, we pay much attention to specific strategies regarding how to carry out PBL and how to use the features of ALC. Those strategies
include how to design PBL problems, how to be an effective PBL tutors, how to design PBL assessment and evaluation plan and how to integrate PBL into ALC.

Monitoring strategies. Monitoring strategies control the process of carrying out a task. As participants acquire more and more strategies for PBL approach, they will encounter a new management or control problem: how to select among the various possible problem-solving strategies and how to decide when to change strategies. Monitoring strategies require reflection on the problem-solving process in order to determine how to proceed (Collins, et al., 1987). In our training, the monitoring strategies are concerned about how to select strategies at different PBL stages and how to use PBL under different contexts, such as the strategies of carrying out PBL in large-size classes.

Pedagogical strategies. Collins, et al. (1987) believed that pedagogical strategies should be designed to give learners the opportunity to observe, engage in, and invent or discover expert strategies in context. They claim that such approach will enable learners to see how these strategies fit together with their factual and conceptual knowledge, and how they cue off and make use of a variety of resources in the social and physical environment. This is the essence of situated learning. Based on this belief, they proposed six teaching methods to help learners acquire an integrated set of cognitive and metacognitive skills through processes of observation and of guided and supported practice, as well as help learners to focus their observations of expert problem solving and to gain conscious access to their own problem-solving strategies (Collins, et al., 1987). The six methods include modeling, coaching, scaffolding, articulation, reflection and exploration. We integrate the six methods into our design to help professors to acquire cognitive and metacognitive skills regarding the application of PBL in ALCs so
that they can apply what they learn in the training to their classrooms with various strategies under different contexts.

Modeling involves showing an expert carrying out a task so that learners can observe and build a conceptual model of the processes that are required to accomplish the task (Collins, et al., 1987). We integrate expert examples into the learning activities to help the participants to acquire the conceptual model of how to carry out PBL in ALCs.

Figure 1 specifies the activities that are involved with modeling method. For example, when introducing how to design a lesson based on a specific scenario, we will demonstrate a sample lesson based on PBL principles. We will explain the sample lesson in detail in terms of pedagogical strategies, PBL principles and instructional sequence. In this way, the participants can observe and build a conceptual model of the processes regarding how to carry out PBL in the ALC.

Coaching consists of observing learners while they carry out a task and offering hints, scaffolding, feedback, modeling, reminders, and new tasks aimed at bringing their performance closer to expert performance. According to Collins, et al. (1987), coaching may serve to direct learners’ attention to a previously unnoticed aspect of the task or simply to remind the learners of some aspect of the tasks that is known but has been temporarily overlooked. Coaching focuses on the enactment and integration of skills in the service of a well-understood goal through highly interactive and highly situated feedback and suggestions (Collins, et al., 1987).

Coaching is a very important method in our design. There are many activities that are involved hands-on practice and providing feedback. For example, when we introduce
how to facilitate group work, we will require group discussion, case studies and critiques. In this process, the facilitator will perform the role of a coach to offer hints, scaffolding, feedback, modeling and reminders. Refer to Figure 1 for specific activities involved the coaching method.

Scaffolding refers to the supports that the teacher provides to the learners when they carry out a task. The supports can take the forms of suggestions or help or take the form of physical support. According to Collins, et al. (1987), when scaffolding is provided by a teacher, it involves the teacher in carrying out parts of the overall task that the learners cannot manage. In our instructional design, scaffolding not only happens in the workshop but also happens in the online learning community. We provide scaffolds by asking provoking questions, carrying out hands-on practice and providing feedback, and providing cooperative problem-solving opportunities.

Articulation includes any method of getting learners to articulate their knowledge, reasoning or problem-solving processes in a domain (Collins, et al., 1987). In our instructional design, there are several specific methods to encourage articulation of the participants including inquiry teaching, asking for presentation, and group discussion. Refer to Figure 1 for specific activities involved with the articulation method.

Reflection involves enabling learners to compare their own problem-solving processes with that of an expert, other students and ultimately an internal cognitive model of expertise (Collins, et al., 1987). Some activities in our design promote reflection by enabling the participants to compare their teaching strategies with expert teaching strategies, compare different expert teaching strategies, as well as compare their strategies
before the training with their strategies after the training. Refer to Figure 1 for specific activities involved with the reflection method.

Exploration involves pushing learners into a mode of problem solving on their own. Forcing students to do exploration is critical for learners to learn how to frame questions or problems that are interesting and that they can solve (Collins, et al., 1987). In our design, at the end of each part, the participants are required to explore specific issues regarding PBL in the online community or other places. Refer to Figure 1 for specific activities involved with articulation methods.

**Sequence.** Collins, et al. (1987) identifies three dimensions that should guide the sequencing of learning activities in order to facilitate the development of problem-solving skills. The three dimensions include increasing complexity, increasing diversity and global before local skills.

Increasing complexity refers to the construction of a sequence of tasks and task environments that more and more skills and concepts necessary for expert performance are required. The activities in the workshop in each part become more and more complex based on the skills and strategies needed to solve the problem. The whole workshop is carried out by increasing complexity as well.

Increasing diversity refers to the construction of a sequence of tasks in which a wider and wider variety of strategies or skills are required so that the learners can distinguish the conditions under which the strategies or skills apply. In the later part of the workshop, the participants will conduct tasks that require the integration of several skills or different strategies.
This sequencing of activities provides learners with the opportunity to build a conceptual model of how all the strategies fit together before attempting to produce the pieces (Collins, et al., 1987). The workshop provides the big picture of PBL approach first including the learning theories and some expert PBL models and then provides specific strategies involved in designing PBL environment.

**Sociocultural context.** The final dimension in our instructional design model concerns the sociocultural context of the training. Collins, et al. (1987) abstracted five critical characteristics of sociocultural context including situated learning, culture of expert practice, intrinsic motivation, exploiting cooperation and exploiting competition. We choose not to integrate the competition characteristic into our design because of the diversity of the learners and diversity of subjects involved. The other four characteristics are fully demonstrated in our design and the activities. For example, we try to provide authentic content and activities for the training. We will show expert modeling. We encourage discussion and information sharing both in the workshop and in the online learning community.

**Integration of ALC features.** In this model, ALC features are integrated into each of the other components of the model. Professors will be situated in the ALC. All the learning activities will be carried out in the ALC, through which the professors can experience the features of ALC by using them. Generally, an ALC has following features.

First, learners can share their screens with the entire classroom promptly, which enables efficient communications and discussions. This feature can be used in all the pedagogical strategies mentioned in the instructional design model especially in
articulation. When the professors present their ideas, they can connect their laptops to the screens of the ALC immediately. After they experience such feature, they will probably take advantage of it in their teaching in the future.

Second, large screens facilitate better presentations of messages such as videos, graphs and pictures. This feature can be used to present instructional content or present professors’ sample work. It benefits the training in terms of facilitating articulation, reflection and scaffolding. By experiencing this feature, professors will have a better understanding of how to take advantage of it in their classrooms.

Third, round tables facilitate interaction and collaboration among learners. Interaction and collaboration is a critical aspect in constructivist learning environments. We will maximize the advantage of round tables by engaging professors into group discussions and team work activities. We will also emphasis on the interaction and collaboration in PBL environment, thus professors will encourage many group activities in their teaching. In this way, the advantage of round tables will be maximized.

Fourth, round tables make it difficult for learners to hide from each other or from the instructor physically, which will probably result in better learner engagement. Since professors will be situated in the classroom, they will find out the advantage of this feature, and will be motivated to use the ALC.

Fifth, podium is placed in the center of the classroom, which facilitates the interaction between teachers and students. This feature reflects that the ALC aims to change the traditional teacher-centered approach to student-centered approach. When professors are situated in the ALC, the facilitator will enable them to experience the
interaction between the instructor and the learners. This feature provides convenience to
the instructor in terms of reciprocal teaching such as providing feedback and monitoring
student progress.

Sixth, learners have writing space on walls for collaboration. The feature helps
learners to articulate and reflect their ideas. We will design activities to enable professors
to discuss in groups and encourage them to use the writing space. By modeling how to
utilize this feature, professors will probably take advantage of it in their classrooms.

Seventh, learners have Internet access to laptops, which enables them to search
for information and resources instantly. This feature will help learners explore new
information and resources. Professors will be encouraged to explore information on the
site in the workshop to experience this feature. In the instructional content, we will put
emphasis on the importance of encouraging exploration in PBL environment.

It is not difficult to learn to operate the facilities of the ALC. The difficult part is
how to enable the professors to facilitate active learning in the ALC. Traditional teacher-
centered approach does not necessarily need round tables or several big screens. The
ALC is to provide more opportunities to engage students and motivate active learning. In
our model, we try to integrate PBL approach with ALC features seamlessly so that
professors can truly understand the concept of ALC and how to facilitate active learning
in it.

Conclusion

The components in the framework are not isolated. They are firmly related to each
other. Some of them are overlapped. For example, the sociocultural context is reflected in
the component of pedagogical strategies. These components influence one another. When all of them are combined together, we believe a robust interactive and meaningful learning environment will be created.

**Instructional Design Process**

Based on task analysis and the instructional design model, it can be concluded that the instructional content of the training should focus on the application level. The most important content should be specific strategies for a curriculum based on PBL in the ALC. Therefore, we include four major parts in the training: the concept of PBL and principles behind PBL, how to design PBL problems, how to facilitate PBL environment and how to integrate PBL into the ALC. The four major parts can be further broken down into sub-sections by referring to our task analysis.

Once we decide the instructional content, we need to sequence the instructional content. This can be achieved by referring to task analysis and the instructional design model. We will sequence the content based on the strategies of increasing complexity, increasing diversity and global before local skills. The objectives in our task analysis also provide guidance on the sequence of specific learning activities.

After the instructional sequence is determined, we need to figure out the instructional strategies regarding how to deliver the content. In our instructional design model, we put emphasis on situated learning and reciprocal teaching. We will try to apply the principles of situated learning and reciprocal teaching into our learning activities in the workshop. When designing each learning activity, we will try to make the context as authentic as possible. We will also design question prompts, group discussions and team work activities to encourage critical thinking as well as interaction and collaboration. We
will also integrate the ALC features into each learning activity to demonstrate the advantages of the ALC based on our descriptions in the instructional design model.

Appendix A is an overall instructional plan for the workshop. It demonstrates how we sequence the learning activities and how we use situated learning and reciprocal teaching in the training based on our task analysis and the instructional design model.
Assessment and Evaluation Plan

Although there is disagreement, most definitions of evaluation involve three key concepts: (a) systematic inquiry; (b) judgment of merit, worth, value, or significance; and (c) information for decision-making (Rallis & Bolland, 2004). There are some distinctions between assessment and evaluation in terms of purposes. Assessment provides feedback on knowledge, skills, attitudes, and work products for the purpose of elevating future performances and learning outcomes. Evaluation determines the level of quality of a performance or outcome and enables decision-making based on the level of quality demonstrated (Baehr, 2010).

In our training, the assessment and evaluation plan serves two major functions. First, it will inform the instructional designers and the facilitator of the progress and limitations of the training, so that appropriate changes and actions can be made accordingly to ensure the success of future training. Second, summative evaluations will be conducted so that the funders of the training can judge the merit, worth, value or significance of the training and judge whether the training meets the preset goals and objectives. Based on the purposes of the assessments and evaluations, following assessments and evaluations will be conducted at different stages.

Formative Evaluation on the Instructional Design

A formative evaluation will be conducted upon the completion of the instructional design so that revisions can be made to make the instructional content and materials more effective and efficient (Smith & Ragan, 2004). We will review the
instructional materials with Subject Matter Experts (SMEs) in order to examine the accuracy of the content. The major review questions will include but are not limited to:

- Are the learning objectives appropriate?
- Are there any tasks missing?
- Are the instructional contents accurate?
- Are the instructional strategies appropriate?
- Do the activities cover the objectives?
- Are the learning activities engaging?
- Are the question prompts appropriate in terms of scaffolding knowledge?
- Are the sample lessons and examples appropriate?
- Are the instructions to the facilitator of the workshop clear?

The comments of the expert will be valuable for assessing the instructional design. Revisions will be made immediately based on the comments. The facilitator will rehearse the instructional plan to make sure that the whole instructional plan can be carried out smoothly.

**Summative Evaluation on the Training**

Summative evaluation is to collect, analyze, and summarize the data related to the instruction to make judgment regarding the effectiveness of the instruction (Smith & Regan, 2004). Upon the completion of the workshop, we will conduct the workshop quality questionnaire to evaluate professors’ perceptions toward the workshop. To determine whether professors are able to design high-quality PBL problems, facilitate group work and reciprocal teaching, and design assessments and evaluations catered to
PBL environment in the ALC, we will conduct pre-survey at the beginning of the workshop in order to know their prior knowledge, and then compare the result of the survey with the data collected after the training. The data will be obtained through class observation, analysis of PBL problems, and analysis of student performance. Each method is briefly described in the following part.

**Prior Knowledge Interview.** Pre-existing knowledge, skills, beliefs and attitudes influence how professors carry out teaching activities. We will ask general questions related to teaching and learning in order to know the professors’ prior knowledge about student-centered learning, technology-enhanced learning, and PBL. The questions will include but are not limited to:

- How do you engage and motivate students into learning?
- How do you use technology in your classroom?
- How do you define Problem-Based Learning?
- What’s the difference between PBL and problem-solving?
- How do you assess students’ performance?

**Observation of Class Demonstrations.** To assess professors’ performance in facilitating PBL in the ALC, we will observe their classes for a semester after the training. The purpose of this evaluation is to better gauge how well the workshop has met the expectations of the actual goal. The content of the evaluation will include three aspects: facilitation of group work in the ALC, facilitation of reciprocal teaching in the ALC, and student performance. With these criteria, we will be able to evaluate whether the instructors apply PBL strategies appropriately in the ALC (See Appendix B).
Analysis of PBL problems. We will collect the problems designed by the professors and analyze the quality of the problems in terms of relevance, structuredness, complexity level, and scaffolding mechanism in the problems. The methods to analyze the data will include expert review and seminar. Professors will discuss relevant issues together, learn from different perspectives and make improvements accordingly.

Surveys on students’ perceptions. Surveys will be conducted to evaluate students’ perceptions toward student-centered learning, PBL environment, and the ALC. The results will reflect to what degree the professors facilitate student engagement in the ALC. The surveys will take the forms of interview and questionnaire. The sample questions will include but are not limited to:

- What’s the biggest difference between the learning in traditional classroom and the learning in the ALC?
- What’s your favorite part of learning in PBL environment in the ALC?
- What frustrates you most in your learning in PBL environment in the ALC?
- How does the instructor help you in your problem-solving process?
- How do you like group work?

Workshop quality questionnaire. The purpose of the workshop quality questionnaire is to understand how the training impacts professors’ perception toward PBL in the ALC (see Appendix C). Each participant will be required to fill out the workshop quality questionnaire at the end of the workshop.
References


Stark, J. S., National Center for Research to Improve Postsecondary Teaching and Learning, A. I., & And, O. (1988). Reflections on Course Planning. Faculty and Students Consider Influences and Goals. From the Program on Curricular Intergration and Student Goals.


### Part 1: Introduction to PBL (3 Hours)

<table>
<thead>
<tr>
<th>Activities</th>
<th>Time</th>
<th>Descriptions</th>
<th>Purposes</th>
<th>Facilitator</th>
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</table>
| 1.1 What is 21st century education? (Watch video & group discussion) | 10 minutes | A two-minute video discussing the capabilities required by 21 century will be played. The video is concise, powerful and to the point. It can serve as a good start for the workshop. Many key words appear in the video: technology, problem-solving, critical thinking and collaboration. | 1. Provide relevance to motivate the participants.  
2. Demonstrate the advantages of ALC by experiencing the visual display (Big screens) in the ALC. | 1. Facilitator will ask questions first to gain attention regarding the required capabilities in 21st century.  
2. Facilitator will type the key words generated by the discussion and display them instantly on the big screens.  
3. When playing the video, facilitator will keep the key words on a screen and play the video on other screens so that the participants can compare their discussion with the video. It will also show the feature of ALC. |
| 1.2 Identify gaps (Group discussion, presentation & reflection) | 20 minutes | After watching the video and discussing the required capabilities, this activity will involve identifying the gap between the required capabilities and the current learner performance. There will be group discussion, presentation of discussion result, and summary. | 1. Provide relevance to motivate the participants.  
2. Enable participants to reflect on their classes and their teaching methods.  
3. Provide useful information to the facilitator regarding the concerns and problems of the participants so that the facilitator can ask relevant questions or give relevant | 1. Group discussion (10 minutes). Questions to be asked:  
1) Considering the capabilities required in 21 century, what problems have you identified in your class or student performance if there is any?  
2) What are the possible causes?  
3) What solutions did you try? Why did or didn’t they work well?  
2. Present the result (three presenters, 10
| 1.3 On-site instructional design | 90 minutes | Give the participants a scenario. Each participant can relate an aspect of the scenario to his or her subject (math, meteorology, law, business, finance, economy, chemistry, etc) and design a lesson. If the participant couldn’t think of any aspect relevant to his or her subject, a general lesson is acceptable. | 1. Bring about the theme (PBL) by relating to their current teaching methods of the participants (provide relevance).  
2. Compare their current teaching methods and the PBL approach  
3. Enable the participants to recognize the benefits of PBL.  
4. Enable the participants to identify the major strategies and principles of PBL.  
5. Demonstrate the advantage of ALC features by visual display (screens) and peer interaction (round tables).  

Suggested scenario: Efficiently utilize the uncultivated land in Norman  
1. Facilitator will ask each participant to design a lesson related to his or her subject based on the scenario (20 minutes)  
2. Two volunteer presenters will present and discuss their lessons (20 minutes)  
3. Facilitator will provide a sample lesson based on PBL for this scenario (20 minutes)  
Note: The activities in this sample lesson should reflect all the basic principles and strategies of PBL.  
4. Discussion and summary (20 minutes)  
   1) Discuss the possible learning outcomes of the sample lesson and why. | 3. Summary (5 minutes)  
At the end of the workshop, the facilitator and participants will review the concerns and problems to see whether strategies are provided. |
| 1.4 Introduction to PBL | 60 minutes | Give the participants a big picture of PBL through discussing the theoretical root of PBL and its benefits, principles and models. | 1. Enable the participants to understand the concept of PBL.  
2. Enable the participants to embrace PBL as an approach to meet the requirement of 21st century.  
3. Enable the participants to familiarize some PBL models so that they will have a basic understanding of PBL process.  
5. Demonstrate the advantage of ALC features by visual display (screens) and peer interaction (round tables). | 2) Summarize the strategies and principles in the sample lesson. |

Note: This activity is not necessarily designed to prove that PBL is better than other approaches, but rather, to provide an option to the professors to facilitate active learning.

PowerPoint presentation
1. What is PBL? What is the theoretical root?  
2. What are the benefits of PBL? How can PBL approach meet the capabilities required in 21st century?  
3. Introduction to PBL models (select one or two models including PERFECT model)  
4. Facilitator will require the participants to explore different PBL models and resources in the online learning community website and other referenced places, to find out what is interesting and what is confusing to them. The participants will be required to share their experience and perspective in the online learning community.

Note: There are many interactions between the presenters and the participants embedded in the PowerPoint.
**Part 2 How to Design PBL Problems (3 Hours)**

Before the second part of the workshop, participants will be required to prepare a news event based on its discipline.

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<th>Facilitator</th>
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</table>
| **2.1 What is a good problem?** <br> (Group discussion) | 15 minutes | Discuss and conclude what an appropriate PBL problem is.                     | 1. Provide relevance to motivate the participants.  
2. Enable the participants to distinguish ill-structured problems from well-structured problems.  
3. Enable the participants to recognize the characteristics of an appropriate PBL problem.  
4. Demonstrate the advantage of ALC features by visual display (screens) and peer interaction (round tables). | 1. Facilitator will ask the participants to compare an ill-structured problem with a well-structured problem for a sample lesson (5 minutes)  
2. Facilitator will facilitate group discussion regarding the characteristics of an appropriate PBL problem (10 minutes)  
(relate to real world, motivate students; require decision-making or judgments; are multi-discipline, multi-stages; are designed for group work; pose open-ended initial questions that encourage discussion; incorporate course content objectives; encourage higher order thinking, etc.) |
| **2.2 Strategies for designing PBL problems** <br> (Group discussion & presentation) | 60 minutes | Discuss and conclude strategies for designing PBL problems.                 | 1. Provide relevance to motivate the participants.  
2. Enable the participants to recognize different strategies and principles for designing PBL problems.  
3. Demonstrate the advantage | 1. Facilitator will facilitate group discussion regarding the strategies for designing PBL problems (15 minutes)  
2. Facilitator will show the result of the discussion.  
3. PowerPoint presentation: How to design PBL problems. Refer to Hung |
<table>
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<tr>
<th>2.3 Sources of Problems (Group discussion)</th>
<th>15 minutes</th>
<th>Group discussion to identify good sources of problems.</th>
<th>1. Enable the participants to identify sources of problems. 2. Demonstrate the advantage of ALC features (Internet access and facilities to share information promptly)</th>
<th>Facilitator will prepare a list of resources for reference.</th>
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| 2.4 How to design a problem for a lesson (Hands-on practice) | 90 minutes | Use the strategies and principles to design a problem for a lesson based on the news event brought by each participant through team work. | 1. Enable the participants to apply the strategies and principles for designing PBL problems to real world scenarios. 2. Demonstrate the advantage of ALC features by visual display (screens), peer interaction (round tables) and internet access and facilities to share information promptly. | 1. Facilitator will ask each participant to use the strategies and principles to design a problem for a lesson based on the news event brought by each participant (15 minutes). 2. Each participant will pair a partner and present the lesson to each other; discuss the strengths and weaknesses (15 minutes). 3. Each participant will present his or her partner's design in front of the whole class. Facilitator and the whole class will give comments after each presentation regarding its strengths and weaknesses (40 minutes). 4. Questions and summaries (20 minutes). 5. Continued discussion regarding how to design PBL problems will be provided. Participants will explore more information and share their perspectives in the online-learning community. |
## Part 3 How to Be an Effective Tutor in PBL Environment (3 Hours)

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</table>
| **3.1 How to facilitate group work (Group discussion and presentation)** | 60 minutes | This activity is focused on a specific part of PBL: group work. The presentation will include examples and interactions. | 1. Provide relevance to motivate the participants.  
2. Enable the participants to identify the strategies and principles for facilitating group work.  
3. Demonstrate the advantage of ALC features by visual display (screens), peer interaction (round tables) and internet access and facilities to share information promptly. | 1. Facilitator will facilitate discussion (30 minutes).  
Questions to be asked:  
1) Why groups? (5 minutes)  
2) List 5 behaviors or actions that can undermine good group work (5 minutes)  
3) Discuss those behaviors and how to avoid them (20 minutes)  
2. PowerPoint presentation: How to facilitate groups  
The main content will include principles of collaborative learning, the strategies to form groups, the strategies to engage students in group work, rules set for students in their group work, the strategies to facilitate the group work in large class, peer evaluation, etc. |
| **3.2 How to facilitate reciprocal teaching in PBL** | 60 minutes | This activity is focused on another specific part of PBL: reciprocal teaching. The presentation will include examples and interactions. | 1. Provide relevance to motivate the participants.  
2. Enable the participants to identify the strategies and principles for facilitating reciprocal teaching.  
3. Demonstrate the advantage of ALC features by visual display (screens), peer interaction (round tables) and internet access and facilities to share information promptly. | PPT Presentation  
Questions, discussions and activities will be embedded into the PPT presentation. |
| 3.3 Assessment and evaluation in PBL | 60 minutes | This activity is focused on how to assess and evaluate student performance in PBL. | 1. Provide relevance to motivate the participants.  
2. Enable the participants to identify the strategies and principles for assessing and evaluating student performance in PBL.  
3. Demonstrate the advantage of ALC features by visual display (screens), peer interaction (round tables) and internet access and facilities to share information promptly. | 1. Facilitate discussion: What are the differences between assessment and evaluation? What are the functions of formative and summative evaluation?  
2. Facilitate discussion: what are the key areas to evaluate?  
Critical appraisal; self-regulated learning; group participation; humanistic attitudes and skills; others?  
3. Facilitate discussion: How to assess and evaluate each area.  
4. PPT presentation: Assessment and Evaluation in PBL (specific strategies and sample instruments will be provided).  
5. Continued discussion regarding how to facilitate group work, how to facilitate reciprocal teaching and how to evaluate will be provided. Participants will explore more information and share their perspectives in the online-learning community. |
**Part 4 How to Integrate PBL in the ALC (3 Hours)**

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<tr>
<th>Activities</th>
<th>Time</th>
<th>Descriptions</th>
<th>Purposes</th>
<th>Facilitator</th>
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<tbody>
<tr>
<td><strong>4.1 How to facilitate active learning in ALC</strong></td>
<td>60 minutes</td>
<td>This activity is focused on the features of ALC, and the integration of PBL into ALC</td>
<td>1. Provide relevance to motivate the participants.</td>
<td>1. Facilitate discussion: What features did you observe? Why was the classroom designed in this way? (10 minutes)</td>
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<td>2. Enable the participants to identify the strategies for using ALC.</td>
<td>2 Facilitate discussion: How will you integrate those features into your teaching? (10 minutes)</td>
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<td>3. Demonstrate the advantage of ALC features by visual display (screens), peer interaction (round tables) and internet access and facilities to share information promptly.</td>
<td>3. Facilitator will play several videos regarding ALC (20 minutes)</td>
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<td>4. PPT Presentation: How to facilitate PBL in an ALC (30 minutes)</td>
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<td>5. Questions &amp; Discussions (10 minutes)</td>
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<td><strong>4.2 Redesign the lesson for the scenario</strong></td>
<td>80 minutes</td>
<td>The scenario is the same as the first sample lesson scenario: utilize the uncultivated land in Norman. This time, the participants will have more knowledge about PBL and ALC. They are supposed to make changes or even start from scratch based on what they have learned in the workshop.</td>
<td>1. Provide relevance to motivate the participants.</td>
<td>1. Redesign the lesson based on PBL in ALC (20 minutes).</td>
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<td>2. Enable the participants to apply the strategies systematically to real world problems.</td>
<td>2. Several participants will present the design. Others will discuss and give comments (60 minutes).</td>
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</table>
| **4.3 Summaries** | 20 minutes | This activity is to conclude the workshop, answer questions and give suggestions for future learning. | 1. Clarify confusions.  
2. Conclude learning contents and activities.  
2. Facilitator will give summaries and suggestions.  
4. Promote online learning community. |
Appendix B: Checklist for the Class Observation

We will evaluate four aspects of the classroom activities in order to determine whether the professors are able to use appropriate strategies to facilitate PBL environment. The three aspects are: facilitation of group work in the ALC, facilitation of reciprocal teaching in the ALC, and student performance. Below is a sample checklist. We will require the evaluators to refer to the checklist when observing the classroom activities.

1. Facilitation of group work
   a. Are specific instructions given to students regarding the responsibilities as a group member? Are the instructions clear?
   b. Is the assignment of groups based on rationale? (Teams should be as heterogeneous as possible to provide the best mix of abilities, sexes, and ethnic groups. This enhances elaborate thinking, frequent giving and receiving of explanations and perspective taking in discussing material.)
   c. Is guidance on effective team work provided by the instructor? Is it clear?
   d. Are feedbacks given at different stages of group work? Are the feedbacks relevant and helpful?
   e. Are question prompts given to provoke critical thinking among group members?

2. Facilitation of reciprocal teaching
   a. Does the instructor interact with students actively?
b. Does the instructor apply the strategy of modeling by integrating the features of the ALC?

c. Does the instructor apply the strategy of coaching by integrating the features of the ALC?

d. Does the instructor apply the strategy of scaffolding by integrating the features of the ALC?

e. Does the instructor apply the strategy of articulation by integrating the features of the ALC?

f. Does the instructor apply the strategy of reflection by integrating the features of the ALC?

g. Does the instructor apply the strategy of exploration by integrating the features of the ALC?

3. Student Performance

a. Are students engaged in the learning activities?

b. Do students interact and collaborate with each other in the learning process?

c. Are the products or reports of the students satisfactory? If not, what are the shortcomings?
Appendix C: Workshop Evaluation Questionnaire

Attendee Name:

Workshop Location:

Date:

1. Please rate the overall quality of the workshop
   a. Excellent
   b. Very good
   c. Good
   d. Poor

2. Please rate the workshop in terms of meeting your needs
   a. Excellent
   b. Satisfactory
   c. Poor

3. The workshop contents were appropriate its purpose
   a. Strongly Agree
   b. Agree
   c. Undecided
   d. Disagree
   e. Strongly Disagree

4. The workshop materials provided were helpful.
   a. Strongly Agree
   b. Agree
   c. Undecided
   d. Disagree
   e. Strongly Disagree

5. The workshop activities provided were appropriate its purpose
   a. Strongly Agree
   b. Agree
   c. Undecided
   d. Disagree
   e. Strongly Disagree

6. The activity time were reasonable
   a. Strongly Agree
   b. Agree
   c. Undecided
7. The facilitator was knowledgeable in the subject area
   a. Strongly Agree
   b. Agree
   c. Undecided
   d. Disagree
   e. Strongly Disagree

8. The length of the workshop sessions were appropriate
   a. Too long
   b. About right
   c. Too short

9. How would you rate the quality of the information presented?
   a. Excellent
   b. Satisfactory
   c. Poor

10. Have your knowledge increased through participating in this workshop?
    a. Yes
    b. No

11. Please rate overall quality of this workshop
    a. Excellent
    b. Satisfactory
    c. Good
    d. Poor

12. Would you recommend using ALC and this workshop to your colleagues?
    a. Yes
    b. No

13. What did you like most about the workshop?

14. What was least useful about the workshop?
15. What improvement would you suggest for this workshop?