Experience- Based Learning to Improve University Students’ Competence

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Abstract: Learning problems are influenced by external and internal factors. External factors include lecturers, materials, interaction patterns, media and technology as well as the learning situation. One of the efforts to overcome learning problems is the improvement of learning which is student-centered learning (student center, learning oriented) to provide a learning experience which is challenging and fun. Learning innovations also produce a productive creative learning model which is the combination of collaborative, cooperative and constructive learning. The pattern of learning activities is through four phases namely orientation, exploration, interpretation and re-creations. In the Department of Geography Education, this learning model is chosen with the assumption that it can provide a learning experience, make students active, creative, responsible and fun.

Keywords: experience-based learning, student competence

1. INTRODUCTION
LPTK’S main task is to produce high-quality teachers. Students will work in a variety of educational units prepared through learning programs implemented by the lecturer. The ideal learning process must be intensively discussed, unfortunately, lecturer, in many cases never practices in everyday learning. Students who want to be a teacher tend to imitate what was done by the lecturers. In this case, the learning process modeling conducted intensively and consistently by the lecturers be very useful. Learning by lecturer (teacher’s educators) will have the impact on their students (trickle down effect). Lecturers’ responsibility, then, are very strategic, in addition to exploring the potential of students, lecturers also act as a model of reference. (Direktorat Ketenagaan, 2007).

A number of characteristics attached to the learning process which is considered better to the success of the students have been poured into learning programs at various educational units which would be the LPTK ’ prospective candidate’s main task. Among the characteristics of good teaching is fun, challenging, develop thinking skills, encouraging students to explore, providing a chance to succeed, so that the students will have self-confidence and teachers give immediate feedback so that students know the correct or incorrect one.

Basically the improvement efforts undertaken are aimed to student centered learning, to provide a learning experience which is challenging and fun at the same time. Furthermore, students are expected to get used to use deep approach and strategic approach in learning, not only learning to remember information, or to learn how to pass the course. The last one, it is often called the surface approach or rote learning which is still prevalent among students today.

Department of Geography Education is one of the majors in the Faculty of Social Sciences (FIS) in UNESA which is expected to produce graduates who have the educational competence and competence beyond education. One of the subjects which really supports the achievement of competence outside education is Aplikom II. Aplikom II is an application course of Geographic Information Systems (GIS). Aplikom II comes into effect as stated on curriculum for student of 2012 as compulsory subject. The purpose of this subject is to provide competence beyond the pedagogical competence as a provision for students when they work on the area except becoming a teacher.

On the other hand, the development of information technology make it possible for the learning process to be conducted not only in the classroom, but can be anywhere at any time, so it is necessary to design the course
meaningful and improve independence so this will give meaningful learning experiences. It is important to do because Aplikom II needs extra time as Aplikom II is the application of Geographic Information System (GIS) so that the students need to prepare outside activities with the lecturer. By doing experience-based learning, students can practice independently of various tools in ArcView 3.3 or ArcGIS to practice a variety of GIS analysis techniques so that teaching learning process can be effective Aplikom II.

The general objective of this research and development is to develop learning tools of Aplikom II which is e-learning based to improve the experience which leads to the achievement of student learning competencies for 2012 Department of Geography Education students in Aplikom II.

The students' low score in Aplikom II is not only determined solely by the availability of learning tools but there are many factors. Learning devices are being developed to improve learning outcomes and new professional competence by implementing creative productive learning model on Aplikom II.

2. LITERATURE REVIEW
2.1 Creative Productive Learning

Productive creative learning is an instructional model that was developed with reference of various models of constructivist learning, collaborative and cooperative. The essential characteristics of each of these approaches are integrated to produce a model that allows students to develop creativity to produce a product that derives from an understanding of the concepts being studied. Assumed productive creative learning can make students learn actively, innovative, creative, effective, and fun. Productive creative learning can not automatically be done if the student has not had a stock of knowledge or prior knowledge of the thing being studied. The provision of learning experiences as previous experience is needed. (Dirjen Ketenagaan, 2007)

Learning, according to behavioristic perspective is behavioral change as a result of the interaction of individuals with their environment. The interaction process is the relation between stimuli (S) and response (R). The estuary of learning is habituation. Watson suggests that there are two principles in the formation of habits, namely frequency and novelty. Frequency principle states that the more often people react to a stimulus, if that same stimuli arises again, it will more than likely individuals give the same response to such stimuli. Novelty principle states that if an individual makes a new reprisal against stimuli, then if one arises again stimuli was likely an individual, it will react in a similar manner to the stimuli.

Edwin Guthrie, based on the concept of contiguity, states that a combination of stimuli paired with a movement will be followed by a similar movement when the stimuli reappear. This movement is gained through exercise. Guthrie also noted the principles of coaching and change of habits. Basically the development and change of habits can be done through a threshold method, the fatigue method, and the incompatible response method (method mismatched stimuli).

Thorndike argues that learning is basically a coaching relationship between certain stimuli with a particular response. All learning processes are conducted by trial and error. There are three laws concerning this matter, namely: (1) law of effect, (2) law of exercise, (3) law of readiness. The law of effect states that the results of the relationship between stimuli with the response will be more solid if there is satisfaction, and vice versa. The law of exercise states that a relationship between stimuli and responses will be more solid if there is frequent exercise. The law of readiness states that the relationship between stimuli and responses will be firmed if it is accompanied by the readiness of individual learning.

Learning, according to constructivist perspective is the meaning of knowledge.
It is based on the assumption of knowledge and not merely the picture of fact of the world but is always a construction of reality through the subject. Mind serves as a tool to interpret so that it appears unique meaning. Constructivist emphasises on learning as meaning the structural knowledge, not declarative knowledge as in behavioristik view. Knowledge is formed by the individual personally and socially. Constructivism is personal thoughts expressed by Jean Peaget while Social constructivism perspective is proposed by Vygotsky. Learning based on constructivist emphasises on the process of conceptual change (conceptual-change process). It happens to students when its concept maps are faced with real-world situations. In this process the students perform the analysis, synthesis, argue, make decisions, and draw even conclusions eventhough it is still tentative. Construction of knowledge produced is viability which means that the concept has been constructed can be displaced by another concept which is more acceptable.

Productive creative learning characteristics, among others are: (1) the involvement of students intellectually and emotionally in learning. This involvement is facilitated through the provision of chance for students to carry out exploration of the concept of science that is under review and interpret the results of exploration, (2) students are encouraged to find / construct their own concepts being studied through interpretations by various means such as discussions, observations, experiments, (3) students are given the opportunity to be responsible to complete the task, and (4) in the context of learning, student’s creativity is nurtured by creating a classroom atmosphere that allows students and lecturers to explore important topics. (Black, 2003).

By looking at these characteristics, productive creative learning model is assumed to be able to motivate the students in carrying out various activities so that they feel challenged to creatively solve the task. According to Erwin Segal in Black (2003), to be creative, one must work hard, dedicated, enthusiastic, and confident. Productive creative learning basically are divided into four stages of learning, namely:

1) Orientation
   Learning activities begins with an orientation to communicate and make a deal about tasks and learning steps. In orientation stages, lecturers communicate goals, materials, time, learning activities and assessments.

2) Exploration
   At this stage, students explore the material, concept or problem. Exploration is carried out in various ways through observation, discussion, browsing through the internet, and so on

3) Interpretation
   In the interpretation phase, exploration results are interpreted through analysis, discussion, question and answer, experiment. Interpretation activities should be done in the class eventhough the preparations are conducted out of class.

4) Re-Creation
   At the stage of re-creation, the student is assigned to produce a product that reflects their understanding of concepts/topics/issues that were examined according to their respective creations. Re-creations can be done in groups or individual according student’s option. The result of re-creation option is a creative product that can be presented/displayed/followed up.

2.2 Experience Based Learning
Kolb (1984), building on earlier work by Dewey and Lewin, provides "a comprehensive theory which offers the foundation for an approach to education and learning as a lifelong process and which is soundly based in intellectual traditions of philosophy and cognitive and social psychology". Kolb's model can be used as a description of the learning process in general but his emphasis on reflection places it firmly in the experience-based learning camp. The importance of reflection is emphasised by Boreham (Jenkins,
2000), who notes that "the term 'learning from experience' really means learning from reflection on experience". A similar point is made by Boud et al. (1985), who coined a slogan in the title of their book Reflection: turning experience into learning. Without reflection on experience students are in danger that they may keep making the same mistakes.

As its name indicates, the 'experiential learning theory' affirms the importance of experiential activities such as fieldwork and laboratory sessions, however it does not prioritise those forms of learning. What is important is to systematically take the learner around each stage of the cycle, ensuring that effective links are made between each stage. The model offers an explicit critique of those highly theoretical programmes or courses that do not value the prior experience or knowledge of students. It is similarly critical of those experiential activities (for example, certain field courses, simulations and games) where students receive little preparation for the experience and/or no effective chance to reflect upon the experience and relate it to their wider reading or the more explicitly theoretical aspects of the course (Jenkins, 2000).

As geography teachers when we first hear the central ideas of Kolb's theory it may well have an intuitive appeal for it connects to, even legitimatises, what we already do as teachers. As researchers we may note that it in part parallels the (scientific) research method of observation, hypothesis building, theory, and testing. For geographers it gives a theoretical rationale for the importance of fieldwork, which many of us would agree with Sauer (by Jenkins, 2000) should be central to the geography curriculum. It can also be readily applied to our teaching, whether we are teaching the practical aspects of GIS or the theoretical ideas of feminism. But like all powerful theories it takes us beyond what we already know, and transforms how we conceive and how we act in our role as geography teachers. It is important to emphasise that though the theory does emphasise the importance of learning from experience, through experiential activities, such as fieldwork or using a computer-based learning package, it is just as relevant to the planning of a lecture or seminar-based course or session.

The provision of learning experiences was lead to the achievement of students’ competencies which needs to be done in learning. Research conducted by Swan (2005), Koochang (2009) stated that meaningful learning will provide a powerful learning experience that can improve the competence of disciplines and interpersonal competence. Article 35 Law Number 20 Year 2003 states that the competences of graduates are qualified graduate capabilities that include attitudes, knowledge, and skills in accordance with national education standards.

The importance of achieving competencies that develop the learning experience by providing wide opportunities for learners to master the competencies required for life in the present and the future and at the same time continue to develop their skills to the nation's culture and people who care about the problems of society and the nation today. Learning should also be designed to provide the broadest possible learning experience for students in developing the ability to have certain attitude, knowledgeable, skilled, and act.

3. RESEARCH METHODOLOGY

This research is developmental research (Research and Development) in the field of education. This development research is to develop and implement creative learning based on e-learning on Aplikom II. The target of this research is the implementation of lectures with creative productive learning model of Aplikom II which is e-learning based to students of Geography Education, FIS, State University of Surabaya of 2012A, 2012B, and 2012C.

The implementation activities started in the orientation phase by developing teaching materials, student activity sheets, assessment instrument. Exploration phase was traversed by product trials which are intended to collect data that can be used as a basis for setting the level of effectiveness, and/or appeal of the product. Emphasis on the effectiveness of a remedy would require data on the effectiveness of the products developed. The emphasis of the implementation of e-learning-based learning is on the effectiveness or attractiveness. Based on this fact, the types of
data to be collected will be aligned with the necessary information about the product being developed.

Intended data is data from an assessment expert/product expert which then will be implemented in e-learning based, assessment of students as the actors involved in the e-learning based lecture and student feedback on the implementation of the e-learning based lecture.

4. THE IMPLEMENTATION OF APLIKOM II

Aplikom II is a course which emphasises on the application of various tools in ArcView to analysis GIS. During the implementation phase, Aplikom II was followed by all students of class 2012 A/B/C, amounting to 115 students and 2 students from class 2008 as repeaters. At productive creative phase, students responded to the content, learning implementation and ease of access to the teaching materials that learned. The result showed as follows:

Based on Figure 1 above, in general, students found the content of the lecture material of Aplikom II is easy to understand, this is indicated by the 72 students who stated that the description is good and easy to understand. An understanding of the e learning based lecture is poorly understood by students who thought that there should be a face to face meeting for each material presented, it is proved by the opinion of 25 students who reported to have available the material presented every week. Unpreparedness of students in the e learning based lecture also appeared in 28 students who stated that e learning based lecture does not help the students improve their understanding of the content of Aplikom II. It is also in accordance with the opinion of 33 people who stated that the role of the material presented was only influential in fostering curiosity and encouraging the creativity of students in Aplikom II. In a public statement which asked students to give suggestions and impressions over the Aplikom II, students consider if the implementation is less suitable because students still need the presence of lecturers, students still need to see the way lecturers demonstrated the application of tools and ways/application of GIS.

The response of students to the lecture activities in Geography Teaching Planning course can be seen in Table 4, as follows:

Table 1. Responses of the Student towards Activities in e-Learning Based Class

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Class with e Learning can motivate students to independently learn something</td>
<td>2 9 42 33 7</td>
</tr>
<tr>
<td>2. Class with e Learning can spur students to be creative</td>
<td>1 15 42 26 5</td>
</tr>
<tr>
<td>3. Implementation of e learning can replace the absence of lecturers</td>
<td>6 5 37 34 10</td>
</tr>
<tr>
<td>4. The course becomes easier</td>
<td>4 11 39 31 7</td>
</tr>
<tr>
<td>5. Implementation of the course in accordance with the learning innovation</td>
<td>1 7 31 47 8</td>
</tr>
<tr>
<td>6. Implementation of e-learning -based lecture is supported by adequate wifi</td>
<td>58 26 7 1 0</td>
</tr>
</tbody>
</table>

Source : Primary data (2014)

Note :
1 = not good
2 = deficient
3 = average
4 = good
5 = very good

From Table 1, it shows that the one who moderate to good on the implementation of courses Aplikom II are dominant. Lectures
with e-learning can lead to more independent and creative students, the lecture becomes easier as teaching materials can be accessed anytime and anywhere, and many innovations. Most students (58) complained about the implementation of the lecture which is not smooth because of inadequate wifi constrained so that the condition does not support e-learning-based lecture. Implementation of the evaluation in the lecture course Aplikom II among other things are quiz 1 at the 3rd meeting, quiz 2 at the 6th meeting and Midtest is held on week 13th. Student responses to the evaluation techniques showed a good response, students are challenged to work on the problems presented in e-learning as can be seen in Figure 2:

![Figure 2. Responses to The evaluation of E Learning-based Lecture](image)

The evaluation of e-learning based lecture is designed in 60 minutes. Quiz 1, Quiz 2 can usually be opened at 7:00 to 13:00 pm on Saturday (week 3 and week 6). Quiz varies by class. Middle Semester Exam (UTS) is also designed based on e-learning held on Sunday (Week 13 dated 25-11-2014) the allotted time is 90 minutes and students are given the opportunity to open from 00:00 to 15:00 pm. Students were given the opportunity to open questions once. When students do not directly work Assessment of the e-learning based lecture uses components of participation (P) which is determined by the presence (face to face). The independence in accessing the material presented in e-learning, discussion on the "corner" discussion consulting room is in learrin, consulting assignments outside the regular time.

Task assessment component (T), in this case, a quiz score. The tasks assigned above is based on e-learning task, in addition, the students were also given a task that is done manually (not based on e-learning) is compiling a report of the group include:
- Map input as the main spatial data
- Secondary data analysis support
- The result of plotting with GPS
- Other documentation such as photographs that support the analysis
- Report the results of the analysis group

In this research, e-learning assessment was conducted only until midterm test. This is done because the Final test will be held on January 5, 2015 but on the assessment conducted by researchers showed an increase of quiz given and of midterms (UTS) followed by 115 students.

The results of an assessment of the Aplikom II appeared that, when the implementation of e-learning based assessment indicates that the implementation of the quiz 1 many students who scored less than 75 (<B). The number of students who score less than 75 was caused by the difficulties when working because the first working online, the opportunity to open in only one time also felt less because not all students have a laptop and a modem while the computer in the Laboratory is not supported by adequate wifi. There are three students who obtain 0, it is granted because the student only opened questions given without trying to do answer the question. The opportunity to open quiz question is only once, when students only open question and is not finished yet then the student has no chance to move back (the questions are closed when time has run out).

Independently, students can overcome the problems they have encountered when implementing quiz to-1, so that by the time quiz 2 come, they are more prepared. and get a better score than quiz 1. The opportunity to open question is only once in 90 minutes, but the opportunity to open question is given more. In the 2nd quiz students' scores increased compared with a quiz 1. Readiness of students who attend e-learning-based assessment is also indicated in the Midterm test. It can be seen on the score which increases and obstacles were devreasing but
still the wifi on campus is the main problem. The increase of the score can be seen in Figure 3:

![Learning Achievement Graph](image)

**Figure 2. Learning Achievement**

**Note:**

1. $\text{Score} > 85 \ (\text{Letter} \ : \ A)$  
2. $40 \leq \text{Score} < 85 \ (\text{Letter} \ : \ A-)$  
3. $75 \leq \text{Score} < 85 \ (\text{Letter} \ : \ B+)$  
4. $70 \leq \text{Score} < 75 \ (\text{Letter} \ : \ B)$  
5. $65 \leq \text{Score} < 70 \ (\text{Letter} \ : \ B-)$  
6. $60 \leq \text{Score} < 65 \ (\text{Letter} \ : \ C+)$  
7. $55 \leq \text{Score} < 60 \ (\text{Letter} \ : \ C)$

**5. DISCUSSION**

Electronic learning (e-learning) can increase levels of learning interactions between learners and the teacher or instructor (Enhance interactivity). If it is designed carefully, electronic learning can raise levels of learning interactions, both between students and lecturers, among students, and between students and learning materials (Enhance interactivity). Unlike the case with conventional learning, not all students in learning activities can be conventional, dare or have the opportunity to ask questions or express their opinions in the discussion, because the conventional learning activities can be conventional, limited opportunities or have the opportunity to ask questions or express statements/opinions without being watched or under pressure from classmates.

Aplikom II which is carried out in e learning based got mixed response by the students. In practice, there are a lot of obstacles, it is in accordance with the opinion of 73 students who encounter obstacles in the implementation. Only 18 people who claimed that they do not encounter any obstacles during lectures. Constraints encountered when students follow the e learning -based lecture is and the signal of wifi is limited in the morning-afternoon, in addition to the lectures the students are not familiar with electronic (e learning) that meet several obstacles. The addition of bandwidths at State University of Surabaya from 43 mbbps to 141.8 mbps will be the solution to fix the intranet and internet access at the State University of Surabaya. (Institutional accreditation visitation report Unesa, 2012) Obstacles that many students encountered during the implementation of e learning -based lectures, among others are the existence of wifi in Geography Education department and the Faculty of Social Sciences do not support e learning lectures. According to students, in addition to the presence of wifi on campus that are less supportive, some students who do not have a laptop also stated this as an obstacle in the implementation of e-learning based lectures. Additionally, when students experience problems, sometimes it can not be solved directly though the students have written the complaint in the "discussion corner" because the lecturer does not open/monitor e-learning all the time.

The existence of on-campus wifi is urgently needed to support e learning -based lecture. The student efforts to reduce barriers encountered in the course of e learning among others are, they acces the internet at internet center and sometimes have the modem itself, so it can be done and opened at home. Besides, student was also possible to work and open e learning in other faculties such as the Faculty of Mathematics and Natural Sciences. This shows that e learning lecture allows the interaction of learning from anywhere and at any time (time and place flexibility). Given the learning resources that are packaged electronically and are available to be accessed.
by students via the internet, learners can interact with these learning resources anytime and from anywhere (Dowling, 2002). Likewise, the task of learning activities can be submitted to the lecturer once it is completed. No need to wait until there is an appointment to meet with the lecturer. Students are not strictly bound by time and venue for learning activities like in conventional education.

Students do a lot of e learning-based activities at home and boarding house because most students have their own modem so that they stated that the e learning-based lecture can stimulate student independence in learning. In addition, students also tend to use the cafe to download materials, quizzes and mid term test because the bandwidth in campus is not sufficient. This shows that e-learning can reach learners/students in all part of the area (potential to reach a global audience). With the flexibility of time and place, then the number of learners / students who can be reached through electronic learning more and more or widespread. Space and place and time are no longer the barrier. Anyone, anywhere, and anytime, can learn through e-learning because interaction with learning resources conducted through the internet. Learning opportunities really open to anyone in need.

In the implementation of Aplikom II which is based on e-learning in Geography class 2012 A / B / C mixed e-learning formally or informally. E-learning formally, because the course is based on the curriculum of Geography Education department, syllabus of Aplikom II and evaluations are also based on the rule from Unesa which includes participation in class, active in the download materials, debriefing in corner discussion or questions provided outside the regular lectures. The task is also given in the form of a portfolio / group reports, tests are also given in the form of quiz 1, 2 and Mid term test that has been organized and prepared on a predetermined schedule by the academic calendar of Unesa. E-Learning in this case is also done informally with a simpler interaction, for example by means of discussion corner, mailing lists, and personal facebook of lecturer and students.

E learning-based lecture is basically an improvement efforts made by using technologies and lead to a student-centered learning (student-centered, learning-oriented), to provide a learning experience that is challenging and fun at the same time. Furthermore, students are expected to get used to use deep approach and strategic approach in learning and not just learning to remember information, or to learn to pass the course. The latter is often called the surface approach or rote learning which are still prevalent among students today.

According to students e-learning-based lecture is also able to stimulate the creativity of students which is the sign of constructivist approach, this is because researchers in designing the development of e-learning based teaching materials use the stages of learning constructivist. It emphasises on learning as meaning structural knowledge, not declarative knowledge as behavioristik view. Knowledge is formed by the individual personally and socially.

At this stage of the implementation of e-learning-based lecture also refers to learning based on constructivist emphasis on the process of conceptual change process. It happens to students when the concept of maps is faced with real-world situations. In this process the students perform the analysis, synthesis, arguments, making decisions (to complete the task: preparing learning instrument), and draw conclusions eventhough it is still tentative. In the implementation of this lecture also follows the stages of learning in the perspective of constructivism. In a productive creative learning model there are Interpretation stages. In the interpretation phase, exploration results in the interpreted through analysis, discussion, question and answer, all the experimental analysis techniques in GIS. Interpretation activities should be done when there is face to face meeting eventhough the preparations are done out of class. Furthermore, there is a re-creation stage, students were tasked to produce a report on the analysis that reflects the understanding, experience of concepts / topics / issues that were examined according to their respective creations. Re-creations were done in groups according to results of a re-creation of a creative product.
6. CONCLUSION

Aplikom II which is applied by using productive creative model of e-learning based proved to provide meaningful learning experiences and is able to improve the competence of students in the course. This can be seen in independent learning and searching for information. Other social competence are also apparent at the lecture include the ability to cooperate and responsible in completing a given task. The learning outcomes related to the student's knowledge of GIS and GIS analysis also increased. The students' ability to use a variety of tools in ArcView 3.3 also increases. Various activities aimed at meaningful learning in order to provide learning experiences developed in productive creative learning model. Strategies for improving learning considered capable of providing a learning experience conducted through 1) the effectiveness of interactions that include academic climate and the leadership management both on line and face to face meetings, 2) the effectiveness of understanding relating to learning that emphasizes personal experience, the process of meaningful learning and assessment in accordance with the competence and carried based on each stage, 3) the effectiveness of absorption associated with learning continuity both horizontally and vertically. (Dir. Ketenagaan Dirjen Dikti, 2007).

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