

new pedagogies

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‘New Pedagogies’ of Experience Based Learning Form in Science Learning

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Abstract—In this digital era, information and knowledge become one of the things that can be produced, transferred, and consumed by the public rapidly. This is due to the advancement of information and communication technology, which gives an impact on education. Information and communication technologies become an important part too in learning, including in learning science. At the same time, the Indonesian education including science education are required to produce quality human resources superior to face global challenges as a result of the ASEAN Economic Community (AEC), which began in late 2015. Both require science education to improve quality by utilizing information technology development and communication, stick to science and nature at the same time produce a superior human resources. One alternative solution through ‘new pedagogies’ form such as experience based learning via online or experiential e-learning. Thus learning science are believed to develop conceptual skills, digital skills, and manual and practical skills of students.

Keywords: *new pedagogies, experience based learning, science learning.*

I. INTRODUCTION

While advancement in Information and Communication Technology (ICT) continues to propel many fields, such as economic, political, social and educational reforms. It is in the field of education that its integration is perhaps most challenging. In schools, colleges and universities, a major requirement for a facilitative academic environment today is digital presence. The development of advancement in Information and Communication Technology (ICT) is transforming the way people learn at a time. The first trend is the rapid acceleration of technological change and the demand that this change places on education. The second major trend is the change that the digital revolution has brought to media usage. This represents not just a shift in learner habits, but also a shift in the way learner interacted with the medium or object.

At the same time, the Indonesian education including science education are required to produce quality human resources superior to face global challenges as a result of the ASEAN Economic Community (AEC), which began in late 2015. Both require science education to improve quality by utilizing information technology development and communication, stick to science and nature at the same time produce a superior human resources. Student as a part of global community, need to be involved to address these issues. Many of the challenges of 21st century will require innovative solutions that have a basis in scientific thinking and scientific discovery. One of the efforts to solve the problem is by implementation experience based learning.

Teaching and learning experiences in education are being transformed by digital technologies. This has required a rethink to identify the pedagogy that underpins the transformation. Modes of learning have changed dramatically over the past two decades—our sources of information, the ways we exchange and interact with information, how information informs and shapes us. But our schools—how we teach, where we teach, who we teach, who teaches, who administers, and who services—have changed mostly around the edges. For both teachers and learners, the digital revolution is transforming the traditional classroom from an uninspiring, laborious and tasking setting to make a expressive and collaborative teaching-learning environment. A teacher’s role as the guide and stage-manager in the emerging digital context cannot therefore be overstressed. Indeed, effective integration of technology into teacher education is a critical variable in the production of competent and dynamic teachers of the twenty first century. It is now realized that a technology-enriched learning environment is indispensable when trying to equip learners with the skills, ideas and information required to improve critical thinking, collaborative skill and technology literacy.

With the expansion of digital learning and technology in the classroom, professional development of teachers must transition to fully realize the potential of these resources to foster student learning. This encompasses using technology, both to guide instruction and to measure, evaluate and understand student learning through data-driven instructional methods. In addition to this shift in role, many teachers lack proficiency with technology. The gap between the teacher role in digital learning environments and teacher technology skills, prevent digital learning and technologies from being used effectively. To make the transition from the traditional role of disseminating content knowledge to that of instructional design in guiding students' discovery and application of information, teachers require a significant investment in time and learning. Teachers have cited professional development as an important component of preparing them to use technology effectively in instruction, including experiential based learning in science learning.

II. DISCUSSION

Since the end of 2015, Indonesia have entered the era of the ASEAN Economic Community (AEC). The era of the ASEAN Economic Community (AEC) becomes a challenge and opportunity for the Indonesian people. The impact of the AEC not only in trade but also all sectors. All sectors must be ready to face this AEC implementation. One thing need to be prepared is the Human Resources (HR) quality. In relation to anticipate the application of the AEC, education is an important element that should receive top priority. So, education should be able to adjust with the times, including rapidly development of technology information and communication in this digital era.

Technology can support the learning of science in terms of providing resources, organizing data, or means of communication. Excellence and computer literacy has increased significantly with the development of multimedia systems and telecommunications capabilities. It provides a logical consequence to the performance of teachers, as stated Chiappetta & Koballa (2010) "Computer and other electronic technologies are changing the work of science teachers as much as they are changing the work of scientist".

Changes in science, technology, and society is rapidly increasing demand change ways and strategies in teaching learners about something they need to know for their future, so the need for learning that is able make study for learners to discover facts and information, process and developing it to into something valuable and beneficial for him/her. The necessary learning is learning that not only repeat the ideas, but the learning is able to explore the ideas of learners. This is so that they are capable of creativity and ready to deal with the problems of the future.

Computer Assisted Instructional (CAI) in ICT provides the learning interaction between students (learners) and a computer with a variety of contents with or without the assistant (Lockard, Abrams, & Many, 1997 in Konukman, 2003). CAI utilizes a computer to facilitate and improve the quality of learners. Learners interact with computers using their own step and the role of a facilitator or coach. CAI directing the attention of students to the different sections in sequence learning program without the help of an educator directly. The integration of CAI framework needs to consider integrating technology in learning science. Bull & Bell (Chiappetta & Koballa, 2010: 258) argues framework integrating technology in the science learning by linking the chain of technology as well as its applications to support science learning, and enables students to understand science naturally. The framework can be described in Figure 1.

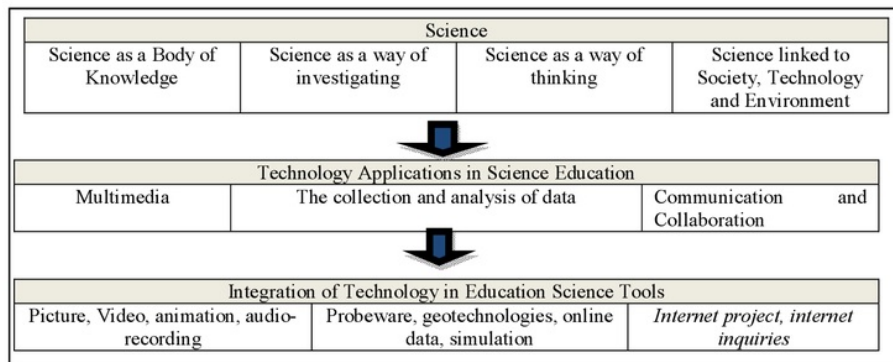


FIGURE 1. FRAMEWORK FOR INTEGRATING TECHNOLOGY IN LEARNING SCIENCE (Chiappetta & Koballa, 2010: 258)

CAI is central to advancing science education and improving student learning outcomes. This view evident in modern learning which stated student learn science by seeking understanding from multiple sources of information, ranging from hands-on activity to internet searching. So, Teacher pedagogy must evolve to meet

the demands of changing classroom environments and learning needs of contemporary students. There is a changing pedagogical role for the teacher in CAI rich interactive because a classroom enhanced with digital educational technology requires interactive pedagogy. The technology can be used actively to facilitate interaction with and between students and immediate constructive feedback to the students. Pedagogical interactivity is the mediation of interaction between the teacher, students, and the technology. There are five points of the nature of whole class pedagogical interactivity. It is ranging from a lecture approach with high teacher control to a collective approach with a high degree of students' control. Questions types and the nature of whole class discourse were indicators of pedagogical interactivity: (1) lecture: no interactivity or only internal interactivity; (2) low level/funneling questioning: rigid scaffolding and surface interactivity; (3) probing questioning: looser scaffolding and deeper interactivity; (4) focusing or uptake questioning: dynamic scaffolding and deep interactivity; (5) collective reflection: reflective scaffolding and full interaction. Integrated with interactive activities were higher order question and student led discussions. Questioning was the means for focusing students' attention, supporting action and for making connection among facts or data. Cognitive approaches to learning cover a very wide range (Murcia in Tan & Kim, 2012: 227).

There are various specialized learning purposes include drill and practice, tutorials, games, simulations, discovery / inquiry, and problem solving in CAI. Each has different rules in operation. In this case, our focus discussion in 'new pedagogies' of experience based learning form. David Kolb (1984: 28), describes the experience based learning process as "a process whereby concepts are derived from and continually modified by experience". Kolb's (1984) work on the learning cycle is among the most often cited in relation to experiential learning. Kolb theorized that learning is a continuous cycle of experience, observation, and reflection; with each cycle, the student modifies his or her understanding and then tests the new insight with another cycle of experience and observation. Components of the learning cycle, in turn, correspond to preferred learning styles.

Experience based learning in 'new pedagogies' form theory borrows its core concepts from Dewey's principles of the continuous interplay between experience and learning, and Freire's dialectical interactions between students and teachers. It follows that experience based learning in 'new pedagogies' form have integrated Freirean dialectical interactions and Dewey's continuity of experiences into online courses (Carver et al., 2007; Lalonde, 2011). Experience is always a critical element in learning. This also applies to e-learning: Quality is directly proportional to the degree that experience is involved. Even good e-learning courses will increase if experience based learning concepts are brought to the fore front.

While the technology might facilitate a dynamic and interactive educational experience, making it happen depends on many factors beyond the technology (Bullen, 1998). The attributes of e-learning like time- and place-independence, many-to-many communication, computer mediation, and interactive communication, do not ensure. Advocates of experiential learning are often highly critical of online learning, because, they argue, it is impossible to embed learning in real world examples. However, this is an over simplification, and there are contexts in which online learning can be used very effectively to support or develop experiential learning, in all its variations:

- 1) Blended or flipped learning: although group sessions to start off the process, and to bring a problem or project to a conclusion, are usually done in a classroom or lab setting, students can increasingly conduct the research and information gathering by accessing resources online, by using online multimedia resources to create reports or presentations, and by collaborating online through group project work or through critique and evaluation of each other's work;
- 2) Fully online: increasingly, instructors are finding that experiential learning can be applied fully online, through a combination of synchronous tools such as web conferencing, asynchronous tools such as discussion forums and/or social media for group work, e-portfolios and multimedia for reporting, and remote labs for experimental work. Indeed, there are circumstances where it is impractical, too dangerous, or too expensive to use real world experiential learning. Online learning can be used to simulate real conditions and to reduce the time to master a skill. Flight simulators have long been used to train commercial pilots, enabling trainee pilots to spend less time mastering fundamentals on real aircraft. Commercial flight simulators are still extremely expensive to build and operate, but in recent years the costs of creating realistic simulations has dropped dramatically.

However, many forms of experience based learning can and do have strong guidance from instructors, and one has to be very careful when comparing matched groups that the tests of knowledge include measurement of the skills that are claimed to be developed by experiential learning, and are not just based on the same assessments as for traditional methods, which often have a heavy bias towards memorization and comprehension.

'New pedagogies' of experience based learning form provides an already existing framework in which to develop a new model for e-learning, one that features the individual, alone or in creative interaction, as the mobile center of gravity of the learning environment. The students and teachers become more effective change agents, develop a sense of belonging to a community, and master both skills and

knowledge in an effective experiential education program. Students engage in multiple forms of active learning in authentic settings, draw on their individual and/or collective experiences, and make connections between lessons covered and situations they expect to face in the future; such as they experience, share, process, generalize, and enact their learning. Teachers create opportunities for students to reflect on their experiences in order to assure assimilation but the learners themselves are the center of this model.

Carver, et.al. (2007) analyzed different types of 'new pedagogies' of experience based learning form based on the degrees to which students' experiences and interactions are drawn into the course design and activities.

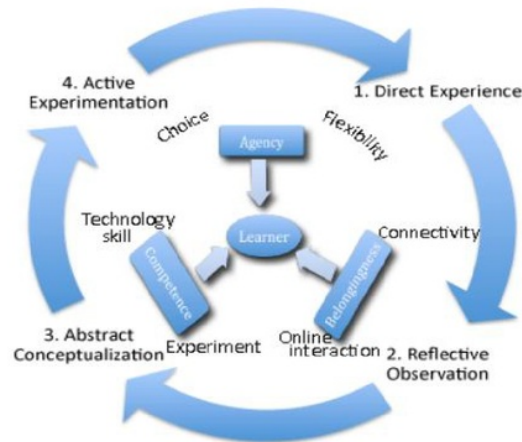


FIGURE 2. THEORETICAL FRAMEWORK INTEGRATING KOLB'S LEARNING CYCLE AND CARVER ET.AL (2007) NEW PEDAGOGIES' OF EXPERIENCE BASED LEARNING FORM OR EXPERIENTIAL E-LEARNING CORE CONCEPTS
(Source: Baasanjav, 2013: 576)

'New pedagogies' of experience based learning or ee-learning theory based on figure 2, which makes a conscious effort to integrate students' experiences into the curriculum (Carver et al., 2007), provides a useful framework to support the full learning cycle proposed by Kolb (1984). Particular emphases are given to students' competence with digital media, learner centeredness, agency bolstering through choices and control over one's education, and belongingness. Students' immediate experiences with digital media mimic the real world situations in which students find themselves in, and this allows the researcher to apply some core concepts of experiential e-learning at the undergraduate level. Experiential e-learning theory helps educators understand how the practicality of technological and skill differences of students plays out in the online classroom without uncritically buying into the "digital natives" arguments

Traditional e-learning uses information and communication technologies to facilitate participant connections, expand access of information, and provide learning opportunities not necessarily constrained by time or distance. 'New pedagogies' of experience based learning form or ee-learning leverages e-learning technology with the philosophy and methodology of experiential education, promoting inquiring forms of community that engage learners in the experiences through which knowledge is created (Trevitte and Eskow, 2007; Riedel et al. 2007). Like experiential education, 'new pedagogies' of experience based learning form places great emphasis on learner participation in authentic tasks and place learner participation and reflection at the center of pedagogical practice. Indeed, experiential education models now being adapted for 'new pedagogies' of experience based learning form, such as service-learning and knowledge-building paradigms. Nevertheless, such models are often vague in defining the specific role of learner participation in the processes of knowledge production and meaning making. More students' experiences and interactions are drawn into the course design and activities, the more online education can bolster agency, belongingness, and competence among online students. Carver et.al. (2007) go on to explain the core concepts of 'new pedagogies' of experience based learning form: 13

(1) Learner centeredness refers to an online class offers a learner much more flexibility and control over the learning process. A learner often decides when, where, and from what sources he or she learns, and this situation requires that the teacher focus on an individual learner, his or her interests, and his or her prior experiences and learning styles

(2) Agency refers to the sense of a learner being capable of taking actions and making differences.

(3) Belongingness because a range of online communication strategies that have become available in recent years offer more connectivity between teachers and students, as well as among students. It can thereby increasing the potential for a student's sense of belongingness

(4) Competence means acquiring knowledge, mastering skills, and learning to apply what is learned – is the focus of all education, whether in traditional or in online learning environment

The key factor in designing 'new pedagogies' of experience based learning form environments is intention. Teachers who use online pedagogies must create curricula purposely designed to include the various elements of experiential learning: reflection opportunities, active projects, and conceptual resources. Without such intention, technology features—rather than educational outcomes—can begin to drive content. It is all too easy to get wrapped up in designing a course around a specific technology, trying to use all of the features that are available in some programs, or lamenting that the available programs do not have certain capabilities. A course-design approach that begins with ideas for activities and then decides which technology features best support those activities encourages a more effective use of technology.

There are several example implementation of 'new pedagogies' of experience based learning form in science learning.

1. Service learning in science learning

E-service in science learning involves opportunities for students to meet young learners, face current environment issues, and assist in meeting a variety of community needs. Students gained insight on local research and found that participating in the scientific process was exciting. Participation in service learning will provide hands-on experience that will allow student to connect with community members who can impact student skill and career development in a variety of ways. Because service learning often involves collaborative project work, student will be able to practice communication and teamwork skills and provide evidence that student can take initiative and are reliable. Student will also be able to practice networking skills, meeting people who student can connect with to explore internship or job opportunities. For example, The DLiTE cohort program launched in the fall of 2002 in e-service learning of science component: the activity Several students volunteered at summer schools and camps, tutoring students in physical science and biology. Other students volunteered for plant and animal inspection through the Minnesota DNR. Under the guidance of the local DNR, one student boated around a four-mile lake looking for Purple Loosestrife. This exotic plant can grow up to six feet above water and three feet below, producing up to 2.7 million seeds per plant. In response to concern that the exotic weed had invaded a lake treated for it in 1999, the student was asked to collect samples and press them for future inspection. Part of her responsibility was to determine the weed's appearance through her own research on the Internet. It appeared to the student that the project was a "fringe" job that the local resource officials could not tend to. Most likely, because of budget cuts, she was the only person available to carry out the task. She provided a needed service with no extra cost to the agency. Another science student worked as a surgical technician in an operating room, examining deer brain tissue for signs of Chronic Wasting Disease. She assisted in the collection of an abnormally shaped protein called a prion, which damages brain and nerve tissue (Strait & Sauer, 2004)

2. Scientific inquiry in a computerized laboratory environment

Computer technology is so common place in the practise and advancement of science. Generally, scientists utilize computer technology in the laboratory for data gathering, storage, analysis, simulating, modeling, and facilitating of automatic control and sharing of instruments. This type of environment learning could transform the way science is taught by fostering inquiry, helping students do investigation, observation, collection, analyzing, and make interpretation of scientific data, as well as to facilitate modeling of scientific principles. The computerized laboratory environment is advantageous in that it provides students with substantially more opportunities to construct an independent understanding of physical phenomena and scientific principles, acquire scientific inquiry skills, and increase motivation and confidence in learning science. For example, virtual laboratory in science learning from <https://phet.colorado.edu/en/simulations/category/by-level/middle-school>.

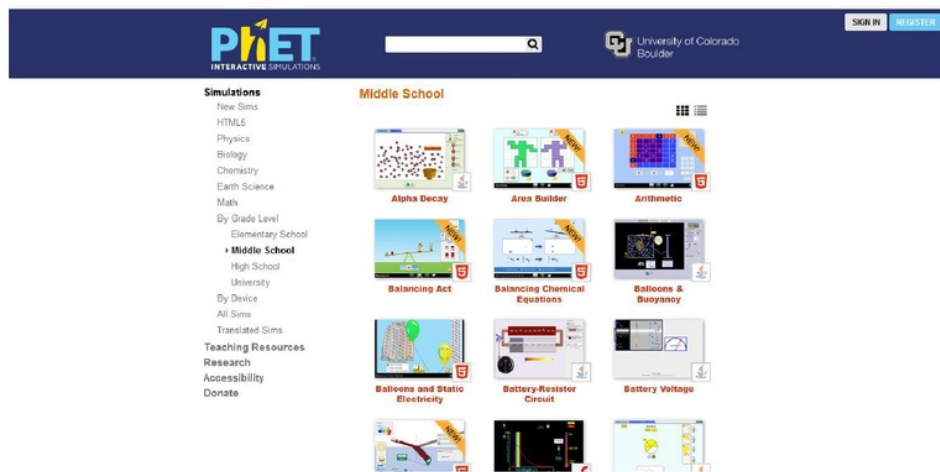


FIGURE 3. VIEW OF PHET.COLORADO.EDU SIMULATION

III. CONCLUSION

Based on the discussion above, it can be concluded that:

1. 'New pedagogies' of experience based learning form or experiential e-learning provides an already existing framework in which to develop a new model for e-learning, one that features the individual, alone or in creative interaction, as the mobile center of gravity of the learning environment.
2. The core concepts of 'new pedagogies' of experience based learning form or experiential e-learning: learner centeredness, agency, belongingness, competence, and center of gravity.
3. The key factor in designing New pedagogies' of experience based learning form or ee-learning environments is intention. The teachers who use online pedagogies must create curricula purposely designed to include the various elements of experiential learning: reflection opportunities, active projects, and conceptual resources.
4. 'New pedagogies' of experience based learning form or experiential e-learning can develop conceptual skills, digital skills, and manual and practical skills of students.

IV. REFERENCE

- [1] Baasanjav, U., Incorporating the Experiential Learning Cycle into Online Classes. *MERLOT Journal of Online Learning and Teaching* [electronic version], Vol 9 no 4. p. 575-589, 2013.
- [2] Bullen, M., Mark Participation and Critical Thinking. *Online University Distance Education. Journal of Distance Education*, Retrieved March 22nd 2016, from <http://www.ijede.ca/index.php/jde/article/view/140/394>, 1998.
- [3] Carver, R., King, R., Hannum, W., & Fowler, B., Toward a model of experiential e-learning. *MERLOT Journal of Online Learning and Teaching*, 3(3), 247-256. Retrieved from <http://jolt.merlot.org/vol3no3/hannum.pdf>, 2007.
- [4] Chiapetta, E.L. dan Thomas R. Koballa, *Science instruction in the middle and secondary school*. Boston: Allyn & Bacon, 2010.
- [5] Kolb, D. A., *Experiential learning: Experience as a source of learning and development.*, Englewood Cliffs, NJ: Prentice Hall 1984.
- [6] Konukman, F., *The Effects of Multimedia Computer Assisted Instruction (CAI) on Teaching Tennis in Physical Education Teacher Education. Dissertation*. Virginia: Faculty of Virginia Polytechnic Institute, 2003.
- [7] Lalonde, C., Courses that deliver: Reflecting on constructivist critical pedagogical approaches to teaching online and on-site foundations courses. *International Journal of Teaching and Learning in Higher Education*, 23(3). 408-423. Retrieved from <http://www.isetl.org/ijthe/pdf/IJTHE1070.pdf>, 2011.
- [8] Nilles, J. M., Some historical thoughts on the ee-learning renaissance. *Innovate: Journal of Online Education*, 3(6). Retrieved October 5, 2013, from http://www.innovateonline.info/pdf/vol3_issue6/Some_Historical_Thoughts_on_the_eeLearning_Renaissance.pdf (archived at https://web.archive.org/web/20130317032334/http://innovateonline.info/pdf/vol3_issue6/Some_Historical_Thoughts_on_the_ee-Learning_Renaissance.pdf), 2007.
- [9] Riedel, E., Endicott, L., Wasescha, A., & Goldston, B., Continuous, interactive, and online: A framework for experiential learning with working adults. *Innovate: Journal of Online Education*, 3(6). Retrieved October 5, 2013, from http://www.innovateonline.info/pdf/vol3_issue6/Continuous_Interactive_and_Online-A_Framework_for_Experiential_Learning_with_Working_Adults.pdf (archived at https://web.archive.org/web/20130317032629/http://innovateonline.info/pdf/vol3_issue6/Continuous_Interactive_and_Online-A_Framework_for_Experiential_Learning_with_Working_Adults.pdf), 2007.
- [10] Strait & Sauer., *Constructing Experiential Learning for Online Courses: The Birth of E-Service*. Retrieved from <http://er.educause.edu/articles/2004/1/constructing-experiential-learning-for-online-courses-the-birth-of-eservice>, 2004.

- [11] Tan, K.C.D & M Kim, *Issues and Challenges in Science Education*. New York: Springer, 2012.
- [12] Trevitte, C., & Eskow, S. Reschooling society and the promise of ee-learning: An interview with Steve Eskow. *Innovate: Journal of Online Education*, 3(6). Retrieved October 5, 2013, from http://www.innovateonline.info/pdf/vol3_issue6/Reschooling_Society_and_the_Promise_of_ee-Learning-An_Interview_with_Steve_Eskow.pdf (archived at https://web.archive.org/web/20130317032511/http://innovateonline.info/pdf/vol3_issue6/Reschooling_Society_and_the_Promise_of_e-Learning-An_Interview_with_Steve_Eskow.pdf), 2007.

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