LEARNING MANAGEMENT SYSTEM (moodle) AND E-LEARNING CONTENT DEVELOPMENT

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ABSTRAK

Pesatnya perkembangan *e-learning* dan penggunaan model LMS telah memicu beberapa universitas dan sekolah di Indonesia untuk mengembangkan *e-learning*. Namun, sebagian besar bahan *e-learning* atau isinya masih kurang memanfaatkan fitur canggih yang tersedia di LMS. Fitur kuat dari LMS dijelaskan dan dibahas bersama dengan prinsip-prinsip pendidikan. Tulisan ini memaparkan pengembangan materi (konten) digital berdasarkan pengalaman penulis dalam mengembangkan *website e-learning di http://elearning.bandungtalentsource.com*. Dalam merancang pengembangan materi digital, pra-perencanaan, perencanaan, pertimbangan pengembangan materi secara *online*, pemetaan pekerjaan, konten yang dirancang dan tulisan, materi pengembangan, pengujian dan pemeriksaan akhir dan evaluasi adalah langkah penting untuk menghasilkan baik pendidikan *e-learning*.

Kata kunci: sistem manajemen pembelajaran, e-learning, pengembangan materi

ABSTRACT

The rapid development of e-learning and the use of LMS (moodle) have triggered some universities and schools in Indonesia to develop e-learning. However, most of their e-learning materials or contents still underuse the powerful features available in the LMS. The powerful features of the LMS are described and discussed along with their educational principles. This paper has elaborated the digital materials (content) development based on the writer's experience in developing e-learning website at http://elearning.bandungtalentsource.com. *In designing digital material development; preplanning, planning, online material development consideration, mapping the work, content designed and writing, material development, testing and final checking and evaluation are essential steps to produce good educational e-learning.*

Keyword: *learning management system, e-learning, material development*

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INTODUCTION

Teaching English has continued using multimedia to evolve from its inception. In the beginning, tape recorders, videos, computers, and CD, have been used to teach English in the classroom. The most recent entry into the delivery category of teaching English is web-based teaching and learning activities along with their rapid developments. Universities around the world have been implementing and upgrading course delivery systems for years. Some universities in Indonesia have also implemented e-learning through their Learning Management System called 'moodle' for the last decade. The World Wide Web, however, is just beginning to appear in our nation's public and private high schools. As schools in big cities in Indonesia increasingly turn to technology as a valuable tool, research and development at the junior and senior high school level must be increased and be continuous to determine how new technologies help facilitate students' learning and motivation to learn.

The demanding and competitive world becomes the key of e-learning. With the existing resources and information over the internet, some lectures and teachers in big cities encourage their students to be able to take initiative in learning by giving the students tasks, assignments, homework and asking them to use internet as one of the sources. Some universities and schools even apply the blended learning, physical classroom and e-learning. The human invention, in this case technology has created an environment with 'screen'; motion pictures, televisions, computers and mobile phones. When TV was invented, people worried about the negative impact of this technology. Similarly, some are concerned about the bad effect of computers and internet. In reality, the students in this era watch computer screen more compared to TV and possibly watch the mobile phone's screen the most. The next 10 years the children will get exposure to internet even at younger age.

E-LEARNING AND STUDENTS' MOTIVATION

Barolli, Akio.K, Arjan.D and Giuseppe. M. (2006) confirm that web-based e-learning system increases study efficiency when there is enough stimulating motivation given to the learners. They claim that materials in form of texts, pictures, sounds give only small stimulating motivations. They found that communication among students and teacher-students interactions stimulate students' motivation more. In other words, the virtual interaction stimulates motivation more compared to the presentation of the materials. Eijl, Albert.P, and Peter.V (2005) confirm that students work collaboratively using discussion forum in the e-learning system gain high marks compared to students work individually. The observation was carried out in a university level where the students have the freedom to participate in the forum or work individually throughout the semester. However, they suspected that some students who did not join the forum might have face to face discussions.

Learning using computers as a media, in the early time, Schramm (1977) suggested that the learning is influenced more by the content and instructional strategy in the learning materials than by the type of technology used. Clark (2001) has claimed that technologies are merely vehicles that deliver instruction, but do not influence students' achievement. In regard to the new trend of using the internet as a medium to support teaching and learning, there is on going debate about whether it is the use of a particular delivery technology or the design of the instruction that improves learning (Clark, 2001). Kozma (2001) argues that the particular attributes of the computer are needed to bring real-life models and simulations to the learner; thus, the medium does influence learning. However, it is not the computer per se that makes students learn, but the design of the real-life models and simulations, and the students' interaction with those models and simulations.

E-LEARNING AND BEHAVIORIST

Early Computer Assisted Language Learning programs were designed based on behaviorist to learning. There are various behavioral theories that extend from Ivan Palov's classical conditioning to the operant conditioning of B.F. Skinner. Ivan Palov's work on "the digestive system of dogs" (Gilliani, 2003. p. 26) came upon interesting idea that changed the history of psychological research. His work, classical conditioning, influenced the work of E.L. Thorndike in the area of applying a behavioral approach to education. He applied his "connectionism theory" into educational planning and developed "law of effect" and "law of exercise" (Gilliani, 2003. p. 27).

Connectionism is a process of forming a connection between stimulus and respond, and Thorndike defined learning as habit formation. Law of effect takes place when a connection is created between stimulus and response and is followed by reward. The next important principle posited by Thorndike for educational purposes was the law of exercise. This principle states that repetitions strengthen connection between stimulus and response. In other words the more practice the stronger the connection is.

Like other behaviorist theories, operant conditioning developed by B.F. Skinner was based on stimuli-responses. This behavioral theory, however, differed from other behavioral theories in respect to stimuli-responses and treatment of reward. In stimuli-responses, Skinner posited two types of response called "respondent" and "operant" to explain human behavior (Gilliani, 2003. p. 28). Respondent is response that occurs to a specific stimulus, and operant response occurs for no apparent reason and it is uniquely human. Gilliani (2003) points out that there are operant responses that a child has the innate tendency to acquire and these operant responses become rooted in human behavior when they are properly reinforced. "This is why Skinner refers to his theory as operant conditioning" and becomes the goal of learning and education (Gilliani, 2003. p. 29).

It is worth noted that tutorial, practice and drill of behaviorism as adapted to e-learning environment, have received a lot of criticism. Jonassen (1991) has criticized practice and drill programs for not using the full potential of computers. He claims that practice and drill programs can easily be done with pencil and paper. On the other hand, Salisbury (1990) believes that practice and drill are more efficient and less costly done with computer. Furthermore, Yunandami (2007) indicates that a large number of junior high school students enjoy learning English using computer.

Gilliani (2003) points out that there is a place for the use of a behavioral approach to e-learning, and states that there are important factors to be considered such as gathering adequate information about the target learners, designing the content and making an appropriate decision about what teaching and learning model should be implemented in the e-learning program. In other words, in the e-learning environment the behaviorists believe that learners should be told the explicit outcomes of the learning so that they can set expectations and can judge for themselves whether or not they have achieved the outcome of the lesson. Tests or assessments must be conducted to determine whether or not they have achieved the learning outcome. These should be integrated into the learning sequence to check the learner's achievement level and to provide appropriate feedback. More importantly the learning materials must be sequenced appropriately to promote learning, such as from simple to complex, known to unknown or knowledge to application. Appropriate feedback should be provided so that students can monitor how they are doing and able to take corrective actions if required.

In most cases, these types of e-learning are used to support the classroom activities. For instant, after explaining certain rules of grammar and asking the students to do exercises in class, the teacher might recommend the students to visit online quizzes or do exercises in a computer as reinforcement. By doing these types of exercises, where feedback and explanations are provided, the students are expected to get more exposure of the materials. This kind of combination, conventional classroom teaching and learning with e-learning, is now popular with the term 'blended learning'.

E-LEARNING, COGNITIVE, AND CONSTRUCTIVISM

Cognitive developmental research has also influenced the development of teaching and learning English in the area of learning capacity. Cognitive developmental research has had an impact on the constructivism movement in education and educational technology (Gilliani, 2003). Constructivism originated in the ideas of Piaget (1952) to account for the way in which children acquire cognitive abilities in an apparently regular order and children are engaged actively in constructing theories about how the world around them works.

Jerome Bruner (1966) proposed a learning theory whose educational implications resemble the concrete to abstract concept of Piaget. Such a process is called scaffolding where the learner is initially dealing with concrete subjects, and the mentor provides a great amount of support. However, the support fades away as the learner begins to think abstractly (Giliani, 2003). This shift can lead to very rapid learning, but is also a risky process because it means abandoning old ways of viewing concept. This notion of scaffolding is useful, because it describes how new models of concept can be introduced to learners gradually and, in a way, lessens the risk.

Furthermore Flavell (1985) has provided a more detailed discussion of three operations as the continuation of Piaget's work in the area of cognitive development. The three operations are called combination reasoning, propositional reasoning, and hypothetical-deductive reasoning (Flavell, 1985). Combination reasoning refers to the ability to consider different factors to solve a problem. This reasoning provides the learner with the ability to look at problems from an integrated approach. Propositional reasoning refers to the characteristics that learners acquire to reason on the basis of assumption to solve problems. Hypothetical-deductive reasoning allows the learner to consider different hypotheses in dealing with a problem. This also enables the learner to gather data and test different hypotheses to come up with a possible solution. In brief, cognitive theories are useful theory to explain how, why, and when learners develop and learn a new concept.

These theories provide a frame of reference by which educators and educational technologies can analyze the behavior of the learner and design educational environments where the learners can construct their own knowledge. These e-learning environments attempt to guide the learners to construct knowledge in the process of learning. In other words, the learners should be given opportunity in doing meaningful activities which facilitates the creation of personalized meaning. Good interactive online instructions facilitate knowledge construction because the learners have to take initiative to learn and to interact with other students and instructors (Murphy & Cifuentes, 2001). Furthermore, learners experience the information first-hand, which gives them the opportunity to contextualize and personalize the information themselves. According to Heinich et al. (2002), learning is the development of new knowledge, skills, and attitudes as the learner interacts with information and the environment. Interaction is also critical to creating a sense of presence and a sense of community for online learners, and to promoting transformational learning (Murphy & Cifuentes, 2001). Learners receive the learning materials through the technology, process the information, and then personalize and contextualize the information.

In the transformation process, learners interact with the content, with other learners, and with the instructors to test and confirm ideas and to apply what

they learn. Garrison (2003) claimed that it is the design of the educational experience that includes the transactional nature of the relationship between instructor, learners, and content that is of significance to the learning experience. In the e-learning environment, the learners have the freedom to explore the learning materials and to experience the learning process. The learners have the freedom to take the path of their own. For example, the learner can login to the site and go directly to class forum to see what the teacher and peers have posted and discussed, then go to learning materials or even directly to the quiz. The learner also has the freedom to logout the program at anytime.

Today's constructivist theories evolve from a conceptual point of cognitive constructivist theory where the learners 'construct' their knowledge, skills or understanding from their own observational and reasoning capabilities (Holmes and John Gardner, 2006). In essence, the socio-constructivist model requires a third dimension to the interaction between learners and other people (Warschauer, 2003). Constructivism underpins the understanding of how individuals learn in a social context and extends to the learning organization, which by nature its members learning together, improves its activities through group reflection and sharing of experiences. In this case e-learning has the potential to overcome some of the limitations of traditional learning, including the fixed times and locations for learning. E-learning allows for a synergy between advances in information and communication technologies. However, it is still considered by many to be simply an add-on to key developments in the technology itself (Holmes, 2006).

The significant development of the technology is the rapid development of very different forms of e-learning such as weblogs, and the multi editor wiki systems. Weblogs or blogs are electronic journals that allow the user to keep records of their writing or recordings on a website. A good example of the use of blog for teaching is the Bay Area Writing Project which has organized the Educational Blogger Network (edBlogNet) with the purpose of helping kindergarten through university teachers "use weblog technology for the teaching of writing and reading across the disciplines" (eBn, 2003). Campbell (2003) states that blogs can be used by teachers and students to communicate in an EFL environment. He suggests using class blogs as a forum for students to express opinions, ideas, and interesting information. Jati (2006) claims that teaching writing using blog gives advantages for teachers and students. All of the teacher's notes will be viewable together in chronological order. This is very convenient when preparing lessons that build upon previous material taught in the class. It is simple to edit class material if the text can be improved or if something new needs to be added. All student writing samples are kept in one place and can be read from any computer connected to the Internet at anytime. Teachers can give collective feedback to the class when a recurring mistake is found by adding entries to a "Writing Feedback" class blog. Additionally, individual

feedback can be given to individual student blogs. Students have access to teacher's complete notes on the Internet. Students have the option of previewing the class material before class and reviewing the material after class. The class material is organized into sections, students can easily find information. Students can read comments for the class as a whole and comments directed at them individually. This maximizes feedback and contact with the teacher. Students can observe how their writing has changed over time.

ICT IN THE CONTEXT OF INDONESIA

The Indonesian government has taken some strategic plans to improve the human resource in ICT sector. Rusadi (2008) reported that the year of 2015 as the year of ICT for Indonesia, where ICT becomes the effective tool in the implementation of government, business sector, and public and also the social stratum communication of ICT for all. The Indonesian government has positioned ICT as the tool to achieve 'long life learning paradigm', and in line with the results of WSIS (World Summit on Information Society) meeting as reported by Rusadi (2008); (1) Indonesian government will at least connect 50% of primary and secondary schools, academies and universities with ICT; (2) Indonesian government will at least connect 50% of educational institutions and research centers that are spread in all regions with ICT; (3) compile and adapt educational curriculum that refers to the formation of knowledge-based society

development. The biggest challenge for Indonesian is to make English teachers at all level become ICT literate and then make them use the rich teaching and learning materials available online.

LEARNING MANAGEMENT SYSTEM

The most commonly used Learning Management System (LMS) for education in Indonesia is 'moodle' which provides a powerful set of tools to create and manage courses, track student attendance and performance, administer quizzes, assignments and surveys.Moodle is designed so that universities, schools, businesses, and even individual instructors can begin to utilize the benefits of web technology as a supplement to traditional classrooms.Moodle is designed to support a style of learning called Social Constructionist Pedagogy. This style of learning is interactive. The social constructionist philosophy believes that people learn best when they interact with the learning material, construct new material for others, and interact with other students about the material. The difference between a traditional class and the social constructionist philosophy is the difference between a lecture and a discussion

Moodle best supports the social constructionist method. For example, there are five kinds of static course material that can be added. This is course material that a student reads, but does not interact with: a text page, a web page, a link to anything on the Web (including material in Moodle site), a

view into one of the course's directories and a label that displays any text or image.

However, there are six types of interactive course material that can be added. This is the course material that a student interacts with, by answering questions, entering text, or uploading files: assignment (uploading files to be reviewed by the teacher and/or students), choice (a single question), journal (an online journal), lesson (a conditional, branching activity), quiz (an online test), survey (with results available to the teacher and/or students). Moodle also offers five kinds of activities where students interact with each other. These are used to create social course materials: chat (live online chat between students), forum (the number of online bulletin boards for each course can be chosen), glossary (students and/or teachers can contribute terms to site-wide glossaries), wiki (Wikis can be inserted into courses, or a Wiki can be the entire course) and workshop (workshops support collaborative, graded efforts among students).

After 6 years experimenting with this LMS for teaching critical reading and presentation skills, the writer found out that moodle has encouraged interaction and exploration; the students' learning experience will often be nonlinear. Conversely, Moodle has few features for enforcing a specific order upon a course. For example, there is no feature in Moodle that would require a student to complete a beginner course before allowing the student to enroll in intermediate course. Similarly, there is no Moodle feature that would require a

student to complete Topic 1 in a course before allowing the student to see Topic 2. If teacher wants to enforce that kind of linear course flow, the teacher would need to manually place the student into the group that is authorized to view Topic 1, and then upon completion, place the student in to the group that is authorized to view Topics 1 and 2, and so on. As a site administrator and a teacher, enforcing a linear path through a course catalogue, or through the material in an individual course, often requires manual intervention.

E-LEARNING CONTENT DEVELOPMENT

The development of teaching and learning resources for e-learning or online learning is very different with offline. The writer is going to share the experience in developing online English for Communication published at http://.elearning.bandungtalentsource.com. As mentioned earlier, that converting printed materials into digital and upload them to a LMS will underuse the important features supporting the teaching and learning process. From the writer's point of view, it is suggested that in developing e-learning materials team effort be often involved, whether or not involved in the teaching. Some of the reasons for this relate to the particular nature of online materials, for example:

- Good online teaching and learning involves various forms of interactivity and consideration needs to be given to how to effectively design and develop the resources that make best use of the

medium, have the right blend of activities, are motivational, accessible, and effective educationally.

- Communication and interaction between students are an important part of effective online learning and have implications for material content development and may need the involvement of special expertise to build this successfully into the online course or learning content.
- Technical issues play a far bigger role in the development on online content than in traditional print-based resources.

PRE-PLANNING

Before starting the process of material development, establishing the right team, in terms of balance of skills and ability to work together is a key success factor. The range of skills which might be represented includes:

- instructional design
- content matter expertise
- technical expertise

A common issue is the under-estimation of both the financial and time resources required for online content development. It is important to be clear where the source of funds is coming from, and gain management support for time release for staff to be involved, before the work begins. When estimating expenses, factor in all costs including on-going maintenance and testing.

PLANNING

The planning phase is probably the most important. The steps involved include:

- Articulating learning objectives – being clear about and communicating to others in the project team the learning aims and objectives. This includes what teachers want the students to see, do, and experience, as well as learning outcomes.
- CharacterizingStudent requirements– nowing the intended audience, their circumstance, and particular needs.
- Locating and assessing existing learning resources – what materials are available in the university or school, what is available that can be used or adapted, what quality they are and can be used as part of the content. Finding out who else has done similar work that canbe learned from.
- Identifying the need for new content and technical considerations, constraints and possibilities – this needs to be done from the outset and will affect both the design and the scope of the development.

ONLINE MATERIAL DEVELOPMENT CONSIDERATIONS

Things might need to be investigated further, that may need to be included in the development activities which include:

- Copyright compliance management – knowing the copyright regulations for online. How copyright permissions should be sought and kept track off.
- Management of intellectual property – this is about protecting ownership of articles used or material developed. Mostly ownership belongs to an institution or to the organisation funding the development but there are sometimes exceptions particularly when multiple parties are involved.
- Collaboration – If the project involves other people or organisations in other departments, or externally, clear agreement should be made.

MANAGING THE 'WORK'

The importance of good management is self-evident. The role may be undertaken by one person or shared depending on the size and nature of the development and the number of and affiliation of team members involved. Typical management tasks include: keeping the work on target, team building and relationship management, instigating and managing quality controls, systemising activities if this is going to be more than a one-off occurrence, contractual tasks and so forth.

CONTENT DESIGN AND WRITING

In this phase the processes are often concurrent and iterative. Processes and steps might differ between organizations and for different projects, but broadly speaking the steps include:
- Establishing the assessment criteria and methods by which students will demonstrate skills, attributes, and understanding. Online offers many more options than a lot of people think. Time spent exploring options here can open up many more ideas for presenting content, and is more likely to produce meaningful and integrated assessment embedded within learning activities.
- Mapping and then sequencing the key elements of the content.
- Applying instructional design effective for online. This includes choosing appropriate teaching strategies; presentation considerations; and building in scaffolding that will support the learners move to independent thinking as they become more familiar with the topic and the medium which is very important to do when learners are not in a face-to-face situation.
- Technical or multi-media decisions, includes deciding what should be presented on screen and what should be downloadable/printable.
- Deciding which is key content, and needs reinforcement, what material can become secondary links, and which comes under the heading of

supplementary or additional learning resources.

- Doing a walk-through and check on time allocations for each learning activity; congruence between assessment and learning objectives and learning content and learning tasks; clarity; and completeness.
- Defining and providing for the learning support needs of the students, and also for teachers if the material is to be used by others.

MATERIALS DEVELOPMENT

This phase takes the material produced in the writing and planning phases and turns it into product. It can either be done during or immediately after the content planning and writing phase, but in either case close liaison should occur between writers and the developers (if these are different people) throughout these stages. This phase includes producing the physical product producing any accompanying documentation such as user guides, implementation guides.

TESTING AND FINAL CHECKING

This stage is an important phase. All the efforts above are of little value if the product is not accessible and usable. Consideration of usability factors actually begins in the planning phase but it should be formally tested during prototyping, then following full production. The importance of testing

and considering the usability factors cannot be over-stressed.

EVALUATION, FEEDBACK AND REDEVELOPMENT

Evaluation is a positive step that can provide good feedback on the effectiveness of the product. This feedback can enable fine-tuning of the product. It also provides valuable feedback to the production team on ways future development outputs can be improved.

CONCLUSION

The rapid development of e-learning and the use of LMS (moodle) have triggered some universities and schools in Indonesia to develop e-learning. However, most of their e-learning materials or contents still underused the powerful features available in the LMS. This paper has elaborated the digital materials (content) development based on the writer's experience in developing e-learning website at http://elearning.bandungtalentsource.com. In designing digital material development; preplanning, planning, online material development consideration, mapping the work, content designed and writing, material development, testing and final checking and evaluation are essential steps to produce good educational e-learning.

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