Unika SOEGIJAPRANATA
Talenta pro patria et humanitate

Youngstown STATE UNIVERSITY

LEARNING TECHNOLOGIES IN EDUCATION: ISSUES AND TRENDS

Editors:
Cecilia Titiek Murniati
Ridwan Sanjaya

www.unika.ac.id

Unika SOEGIJAPRANATA
Talenta pro patria et humanitate

Youngstown STATE UNIVERSITY

LEARNING TECHNOLOGIES IN EDUCATION: ISSUES AND TRENDS

Editors:
Cecilia Titiek Murniati
Ridwan Sanjaya

LEARNING TECHNOLOGIES IN EDUCATION: ISSUES AND TRENDS

ISBN:
978-602-6865-40-3

Editors:
Cecilia Titiek Murniati
Ridwan Sanjaya

Setting layout:
Henry Ernanto

Publisher:
Soegijapranata Catholic University
Jl. Pawiyatan Luhur IV/1, Bendan Duwur
Semarang – Indonesia
Telp. +62448441555
Fax. +62248415429
Email: penerbitan@unika.ac.id

Soegijapranata Catholic University
Semarang - Indonesia
2017

FOREWORD

Technology is changing our experiences. In education, the proliferation of information and resources is provided through various gadgets and platforms. Educational institutions invest millions of dollars to integrate technology in the teaching and learning process to increase students' engagement and improve students' achievement. While the actual impact of technology on learning achievement has been inconclusive, it is commonly agreed that technology brings about various benefits such as increased engagement, critical thinking, and problem solving skills.

This book is a compilation of selected articles presented in International Conference on Learning Technologies 2017. These articles focus on the ways technology can be used to benefit students in their learning process. Some articles highlight the role of e-learning while others discuss the issues of hybrid learning and gamification in education. The contributors of these articles for this book chapter shared their experiences, innovative and inspiring insights, and their passions as well.

This book is a part of our research project funded by the Ministry of Research, Technology, and Higher Education. It would not have been possible without the support from the Ministry in the form of International Collaboration and Publication Grant (*Penelitian Kerjasama Luar Negeri*). Our utmost gratitude goes to Dr. Kristine Blair of Youngstown State University, our co-investigator in our research project, who has been working diligently during our data collection and analysis. We also thank the President of Youngstown State University who gave his approval for the MOU so that our research project can be completed, the former Rector of Soegijapranata Catholic University, Prof. Dr. Ir. Y. Budi Widianarko, M.Sc., for his encouragement and support, the Dean of Faculty of Language and Arts, Angelika Riyandari, PhD., and the Dean of Computer Science Faculty, Erdhi Widyarto, ST., MT. for their approval and support. Last but not least, we also like to thank colleagues, lecturers and ourstanding students who have dedicated their time during the conference and the writing of this book.

TABLE OF CONTENTS

METHODS AND APPROACHES

Modest approaches for learning and emerging technologies impact on learning

Evans Ochola

ABSTRACT

A key idea behind these new approaches and emerging technologies model is that learning should be driven by a focus on students' proficiency with specific aptitudes, and not by archaic school models. Research on new approaches to learning and integration of technology suggests that instructors and schools use new approaches and technology to meet students need if (1) it supports already existing, student-centered practices; (2) it is part of a systemic initiative to implement student-centered learning; and (3) teachers have access to professional development.

In particular, education has always lived in tension between two functions. On the one hand education is a matter of assuring continuity. On the other, it is a matter of developing creativity and change that push learners into the unknown. Both of these functions relate equally to knowledge. They both touch the essence of the instruction/learning process. They are simultaneously complementary and conflictive. Complimentary in that new approaches to learning are made possible by emerging technologies that consolidate policy and further advance instruction and learning. The consensus among education reformers is that improving instructional approaches and emerging technologies, together with well-planned policy, are an important tool for realizing a new paradigm of learner-centered education and content interaction that better supports learners' needs. Components such as providing interactive content, giving immediate feedback, identifying learners' needs, and having student

electronic portfolios are seen as critical elements in learner-centered instruction. Conflictive in that, some difficulties are encountered not only by instructors but also by policy makers in the endeavor to adapt instructional changes to meet students' needs. The challenge to integrate new approaches and technologies into education is enormous, but so are the possible benefits. With educational technologies and new approaches, the sky is not the limit. The limit is human imagination and societal creativity.

INTRODUCTION

The rapid changes of today's world present new challenges and put new demands on the education system. Globally, there is a growing awareness of the necessity to change and improve the preparation of learners in a continually changing society. In this chapter, the focus is on new approaches and the infusion of emerging technologies into the education system to create an impact on the learning and instruction process. The education landscape is witnessing changes in the way education is taught and in the way students learn. These approaches with innovative methods are geared to enhance instruction and learning. These methods undoubtedly influence the way instruction is presented and how students learn. The approaches are generally applicable to any learning environment. These approaches show positive learning effects for students under widely varying conditions. Educators find the practices useful and valuable in investigating the applicability of the new approaches and emerging technologies in their particular circumstances. As with all educational practices, of course, the new approaches can be conducted effectively or ineffectively planned, and the results may vary in a rapidly evolving world.

Despite decades of research about uncovering the limited effectiveness of traditional approaches of teaching, most instructors continue to teach the way they were taught as learners. Most educators focus on the teaching, which typically means conveying information. The research is clear. To educate today's learners to become citizens and professionals, they must be able to address complex problems now and in the future; therefore, the primary focus for educators must be learning.

In the book, Turning Learning Right Side Up: Putting Education Back on Track, Ackoff and Greenberg (2008) emphasize that today's education system is imperfect. They posit, the objective of education to teach how to learn, problem

solve, and combine the old with the new is not just a desirable thing, but an essential objective. To attain these results needed to be successful in modern society, education must be authentic and engaging. Authentic in the sense that what the student is learning has meaning to the student as an individual, and as a member of society and the world of work. Engaging in the sense that the student is involved in the learning process and conquering the skills needed in the world of work.

The world of work demands that all members of society have a minimum level of basic understanding of modern economic, social, political, and technological requirements. No country can afford not to expose its members to these requirements. People without the ability to acquire essential knowledge and skills will have unstable lives, and society will be deprived of their contributions. Similarly, education must reflect equity concerns so that in times of educational change, historical disparities by gender, region, or social grouping are addressed. The prevailing challenge is to reach groups and individuals that are historically underserved: females who face cultural and physical obstacles to educational institutions; rural populations that are too thinly dispersed to populate; and persons with disabilities. In these circumstances educators need to be innovative and think outside the box. Innovation then becomes a continuum, with no marked beginning and end, which provides new paradigms for lifelong learning to help individuals, families, workplaces, and communities to adapt to societal and economic relations.

CONVERGENT AND DIVERGENT APPROACHES

A combination of convergent and divergent instruction is essential. Offering convergent and divergent approaches provide learners with the ability to find their best way of learning. These approaches benefit each other. Convergent instruction is where the instructor transmits the necessary information to the students. This view is explored by Guilford, Green and Christensen (1950) who described the convergent thinker as one who can be distinguished by the ability to deal with problems requiring one conventional correct answer clearly obtainable from the information provided. It is a way of thinking where the learner draws on prior knowledge to answer the set of questions. This means information is provided in a precise way, encouraging learning in a direct path. Whereas, divergent instruction encourages the learner to take risks, learn how to be flexible and to use imagination--a method of instruction where learners are asked to produce as many answers to the problem as possible. This method is

very student-centered. Indeed, this type of learning and thinking is associated directly with creative thinking (White, 1990) because of the amount of thinking required to solve a problem in divergent ways. The learners are encouraged to explore different solutions. This approach encourages learners to be actively engaged in the learning process since it requires the learner to produce detailed answers. The tendency in the education system of today is toward the convergent approach. There is a strong emphasis on setting convergent goals, an example of standardized testing which is universally viewed as the best way to determine the success or failure of the instruction and learning process. Other means of evaluation which are more complicated and more demanding in terms of application and interpretation, has been neglected.

There is a need for both convergent and divergent approaches to teaching and learning. The increasing formalization and technological sophistication of modern economies requires educators to meet the demands the education system is grappling with in today's world of work with its increasing complexity. The importance of specific knowledge as a useful way to prepare learners for productive future functioning in the world of work is paramount. A divergent approach is needed today. With the great increase of knowledge and changes in most fields as well as the arrival of many new fields, it is important to equip learners with the ability for self-directed learning and self-growth. Therefore, convergent and divergent teaching approaches are both needed and the challenging question is how to strike the balance between them with-in the intricacy of the process of teaching and learning. It is probable that the two approaches may increasingly become not mutually exclusive but interrelated and interdependent. Convergent problems often need divergent thinking, and there are assessments that encourage both convergent and divergent processes.

Educators and stake holders must recognize that change is a major part of education, whether it is change in instruction and learning approaches, technologies or policy. Most of the time the society continues to grapple with how change occurs. For us to wrestle with the idea of new methods and maximize the impact on learning, educators must look at what literature reviews say. Research shows that good student outcomes depends on effective classroom practices and that learners must be equipped with instruction in skills necessary to operate success-fully in the society. Brophy (1988) described aspects of teaching practice which are related to effective classroom learning and student outcomes. Triumph is influenced by teaching strategies (Wang, Haertel & Walberg, 1994), and it is therefore important that instructors modify approaches to ensure equitable pedagogy.

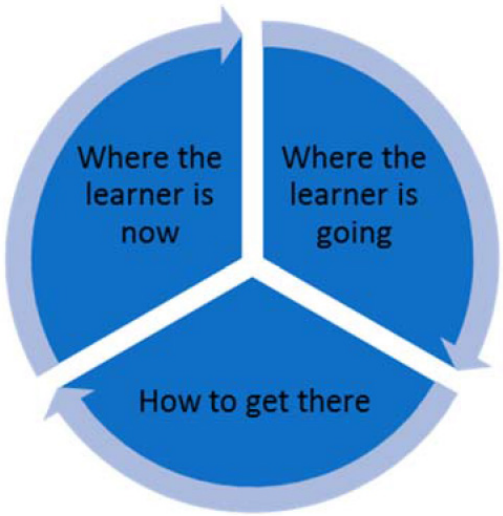
Thus, new approaches and emerging technologies that maximize the impact on learning entail clarity, consistent, pedagogy, feedback and assessment. Clarity within the classroom has been found to correlate positively with student achievement, level of engagement, and student satisfaction. The instructor simplifies the purpose and learning objectives and provides clear standards on how students can be successful. The instructor presents examples to students so they can see what the outcome looks like. In conjunction with clarity, the power of consistency definitely lies in the fact that most things worth doing are difficult to do and take a lot of time and effort. Consistency clarifies the cause and effect of positive thinking. Inconsistency confuses cause of learning. Consistency is about repetition--repeating over again, gaining feedback and adjusting accordingly to help stay on track towards the goal. And that is the difference between success and failure in the learning endeavor, and the key to achievement is collective consistent pedagogy.

These modest approaches offer students concrete apparatuses to achieve learning through questions, analogies, group learning, critical and reflective thinking. Students must learn by dissecting information through active learning by using a variety of resources, learning beyond the classroom and ultimately, real-life experiences. Students should review their performance as they apply knowledge learnt. Students must be encouraged to ask them-selves what they learned from a specific experience. Why did they give the incorrect answer? Did they miss understand the question? Such questions could enhance the learner's strategies and learning outcomes as the learner apply knowledge learned to solve new problems. In fact, Metcalfe (2009) content that applying knowledge learned by students to solve new problems is one of the key elements that increases understanding and learning skills in general.

With a collective consistency, pedagogy represents a distinct way of making learning engaging and satisfying. Understanding how to manage activities and instruction in the class-room empowers the instructor to optimize the learning potential of every learner. Learners who are engaged and challenged see a real-world value to their school assignments. They are more interested in learning, knowing where they are, where they are going, and how to get there. Therefore, effective feedback provides information about how close the learner is meeting the criterion and details what the learner needs to do to meet the goal. Shute, (2008) explains that the role of feedback is to tell the learner whether or not the learner is doing the right thing. Both the mastery of content and, more importantly, the mastery of how to think re-quire trial-and-error learning are essential to student success. Thus, the instructor must pro-vide students with

the kind of feedback that increases motivation, builds on existing knowledge, and helps students reflect on what they have learned.

Hattie and Timperley (2007) highlight the importance of being specific as possible and supply students with specific information about what they are doing right or wrong. For example, feedback like “excellent work” do not show the learner what the learner did right, and likewise, a phrase such as “what does this mean”? Does not give any insight to what the learner did wrong and how the learner can do better the next time around. Instead, researchers suggest taking the time to provide learners with information on what exactly they did well, and what may still need improvement. They also note that it can be helpful to tell the learner what the learner is doing differently than before. Has a student’s improved since the last time you assessed their learning? Let learner know about it, even if learner still has a long way to go (Figure 1).



Numerous studies indicate that feedback is most effective when it is given immediately. The study from Opitz, Ferdinand, and Mechklinger (2011) looked at delayed verses immediate feedback. The researchers found that participants who were given immediate feedback showed a significantly larger increase in performance than those who had received delayed feedback. Other research showed that students who received lots of immediate feedback were better able to comprehend the material they study. Effective feedback addresses the learner’s advancement toward a goal. The feedback must be clear to the learner in terms of how the in-formation they are receiving will help them progress toward their final goal. Therefore, feed-back needs to provide information specifically

relating to the task or goal process of learning that fills a gap between what is understood and what is aimed to be understood (Hattie & Timperley, 2007), and it can do this through affective processes, such as increased effort, motivation, or engagement.

Some research noted that the way feedback is presented can have an impact on how it is received, which means that sometimes even the most well-meaning feedback can come across the wrong way and reduce a learner's motivation. Other research showed that not all feedback is equally effective, and it can even be counterproductive, especially if the feedback is presented in a solely negative manner. Research by Deci and Ryan (2008) identified three situations in which feedback could be counterproductive: i) If learners feel that they are being too closely monitored, they might become nervous and as a result, disengaged from learning, ii) Learners may sometimes interpret feedback as an attempt to control them rather than guidance on how to improve, iii) Feedback shared in a group setting could cause learners to feel like they have to compete with their peers.

To avoid these three situations, Deci and Ryan suggest fully explaining the purpose and ensuring that learners understand how the feedback is meant to help them. Students are what the instructor guides them to do. Learners are the center of the classroom, not the instructor. However, the instructor is the most impactful person in the classroom. With helpful feedback, students become more motivated about learning and confident in their abilities. They take ownership of their learning. Black and William (1998) found that instructors who used formative assessment practices with their students, and provided consistent feedback, significantly improved performance as students make significant gains.

However, while the instruction principles are similar, the landscape between the traditional models where the instructor is the sage on the stage has changed quite dramatically in recent years. With flexible instructional approaches and technological capacities which are evolving with increasing rapidity, teachers can use multiple ways of teaching and assessment. New paradigms, technology, and interactivity in themselves do not necessarily constitute an enhancement of the quality of instruction and learning, quality of content is important, but new approaches are an enabler for such enhancement. The bottom line, is great opportunity for both instructors and learners to draw on a wide range of materials in a variety of formats which can improve the quality of the curriculum. All things considered, students are exceptional, and so is the way they learn. Thus, the instruction tools used in schools should cater to diverse ways of learning, with

the learner at the center. Most learners will learn better and faster with the help of interactive technologies and new instructional approaches. A combination of these, as well as, improving the effectiveness of learning, such adaptation to learners' needs leads to significantly better outcomes. A model in learning that is founded upon modest approaches in education whose aim is the development of the capacities of each learner. Developing the capacities of individual learners using technologies to enhance learning goals is an effective approach to teaching.

THE IMPACT OF MODEST APPROACHES

The impact of modest approaches is intensified by the parallel emergence of new economic relations at the universal level, subsumed under the emerging technologies. The gadgets alone will not answer all the challenges in an educational system. It is difficult for countries to meet the objective of effective learning, for all, anywhere, anytime. The body of literature shows that the inability to meet educational challenges, however, is self-inflicted because of linear scaling, that is, using the same model of education but more of it and on a larger scale. What educators must do is think outside of the box. The education ideal developed for the Stone Age or Indus-trial Age cannot achieve educational empowerment effectively in the twenty-first century. "The Stone Age did not end because we ran out of stones. The Stone Age ended because we invented bronze tools, which were more productive." With technologies, we should be able to evolve the components of the conventional ideal into the corresponding components of the new approaches and emerging devices. The rise of new approaches and emerging technological tools are profoundly changing the way learners learn, live and work. From preschool to college there is no doubt that technology is having a major impact on teaching and learning. This in turn is affecting the skills needed in the world of work. The gap in technology related skills required in the world of work must be bridged together with new approaches.

Modest approaches together with emerging technologies and the type of school curricula can create tension. The competing and often conflicting demands are in fact ensuring that new approaches, technology and the curricula type remains alive and well. Tension between new approaches, technology, and the curricula functions are complimentary. Technology is to improve education and education is a matter of assuring continuity that is, passing on what is known. On the other hand, it is a matter of nurturing creativity that is propelling learners into the unknown. The emerging technologies and new approaches are at the same time complementary and conflicting. They touch the core of the teaching and learning

process. Both the educator and the learner want creativity, but they want it to emerge from what is known and understood. The learner want continuity, but when the result is the inability to solve problems, the learner is disappointed.

Often time, technology is referred to in the singular whereas technologies are very different in their potential and use. The potential of different technologies depends on how educators use them. Different technologies have the potential to contribute to different aspects of effective learning. These technologies can provide and expand access, promoting efficiency, improving the quality of learning, and enhancing the quality of teaching. Educators must under-stand how to utilize the technologies to meet the challenges of the learners and make education relevant, responsive, and effective for anyone, anywhere, anytime. Technologies have both the potential for knowledge dissemination and effective learning environment. Yet, if the educational policies and approaches are not right, and if the conditions for using these technologies are not met at the same time, this possibility cannot be realized to compliment the world of work.

Justifications for the inclusion of emerging technologies and new approaches in school curricula must focus on the integration. The reason for technology integration is the advantage it has for teachers, students and parents. Technology enables dynamic interaction that is more readily exploited, allows learners to collaborate, and provides tools to increase productivity. Thus, technological literacy incorporates the development of occupational skills and participation in a technological society. At the same time it is a delicate balance for the schools to predict those occupational skills that will be needed in the future. It is important to expose students to different types of technology which is the mainstream of typical life and world of work.

Technology is changing far faster than the schools and policy formulation. As a result, involvement in a technological society requires an understanding of the ways in which technology is changing society. Humans are used to a rate of change that is somewhat contingent and at least allows for reasonable stability. Today, however, rapid and accelerating technological change is constantly overthrowing the stability. The complexity of this relationship between technology and society cannot be overstated, for technology shapes and is shaped by society. In a global society, these modest approaches, emerging technologies have enormous potential to effect change in schools. They enable schools to meet a broader range of learners' necessities, adapting instruction methods and allows learners to learn anywhere, anytime.

MIXED MODEL

Consequently, education will not be a location anymore, but an activity: a teaching/learning activity. The ultimate purpose of technologies is to assist education in teaching and learning activity. Highly interactive mixed model multimedia learning experience be-tween distant locations and networks. A mixed model allows learners to obtain simultaneous distance learning services from dispersed schools and other instructors. In this sense, technologies are not a substitute for schooling. Technologies constitute one integral element of education and its learning environment.

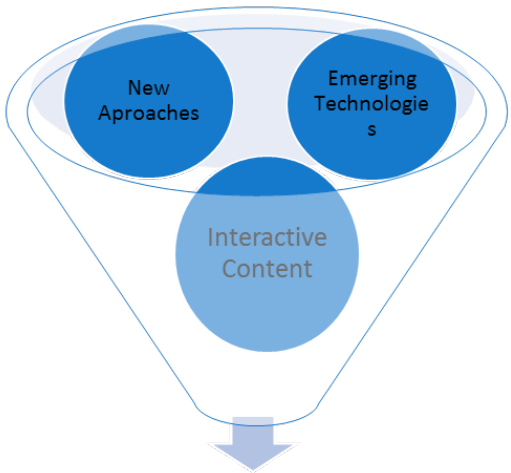
In a mixed model course, with the typical instruction and homework, content-related work that was commonly done in a classroom is now given as homework. Short video instructions are viewed by students at home before they come to class, while in-class time is dedicated to exercises, projects, or discussions. Besides, posting instructions online is not a brand-new idea, nor is it a first for academic settings. The pedagogical model of flipped learning identifies a core curriculum with concepts and lessons that can be taught through posting condensed instruction video clips. Flipped learning changes instruction into collaborative and interactive sessions where students practice that curriculum and explore their passion.

Mixed model courses have succeeded when strategically aligned with the school's mission and goals. The development and delivery of mixed model courses can be used to address a variety of school, faculty, and student needs. Mixed model course success has been proven in terms of performance in part because instructors gain access to real-time data about student performance at each stage of the learning process. Research by Dziuban, Moskal, and Hartman (2005) used factor analysis to identify two dimensions of satisfaction, which they identify as "learning engagement" and "interaction value." They later identified eight elements that con-tribute to learner satisfaction in a mixed model courses (Moskal, Dziuban, & Hartman, 2010). Educators should continue to ask: how can instructors make the best use of the classroom time they have with learners in the classroom? Another way to move learners toward higher levels of understanding is to move the instruction out of the classroom, and use in-person time for interactions that require applying, relating, and creating. Furthermore, Dziuban, Hartman, Cavanagh, and Moskal (2011) maintains that in the mixed model tools such as videos, podcasts and online quizzes enhance in and out of class activity work together. The instruction must be clear about setting and articulating expectations for digital work and participation.

The benefits gained for students by a mixed model course are realized only if the associated risks are lessened; for, without careful course planning and design,

the mixed format could offer the worst aspects of both the face-to-face and online modalities instead of offering the best. The self-motivation is a must for students to be successful in online learning. With a supportive environment for instructor and students, the potential of mixed model learning can be realized. In the mixed model, instructors have the flexibility to incorporate teaching and learning approaches to increase and enhance their students' learning processes.

These emerging technologies and new approaches to education are already having a positive impact on education. Educators must support efforts within the new paradigm agenda to enhance the quality and reach of education globally. Research supports many of the propositions of the new approaches. We are already seeing the facilitation of better quality learning and instruction, as more interactive content for learning are employed. Methods of instructions and learning are tailored to individual learners' needs and learning analytics are allowing quicker feedback on learners' performance. The fusion of new approaches, policy and technology results in interactive environment (Figure 2).



In the body of literature, approaches to orient emerging technologies with interactive content are discussed. All of them are based on an understanding of the shifting educational landscape. The shifting educational landscape requires the integration of these approaches to be infused with emerging technologies and policies that facilitate integration. Policymakers can influence technological integration as part of an innovation agenda to meet the shifting educational landscape. Good policy will stimulate and change the conditions for better implementations.

The emergence of technologies and the evolution of digital games has shaped the new ways in which learners are learning, communicating, collaborating, operating, and forming paradigms. In fact, research shows that these technologies are shaping the way learners think, work, and live. This is especially true of many learners who are soon to be leaving and entering the workforce and society-at-large, it is a fully integrated aspect of their lives (Green & Hannon, 2007). Thus, emerging technologies when utilized the right way help many learners, particularly isolated students. Isolated students, either because of their location or because of their disability, can become part of communities of learning in ways that could have not happened before. These are good reasons to support new approaches and emerging technologies. As research indicates, for these approaches and emerging technologies to be successful there must be good pedagogical frameworks. There are still concerns on whether technology and pedagogy are complimentary or contradictory to each other. The literature review suggest that technology-rich learning resources must be driven by pedagogic. The introduction of any technology into the classroom must enhance existing practices. The question to be asked then, with act of contrition to John F. Kennedy, is not what the technology can do for instructors and learners, but what can instructors and learners do with the technology?

POLICY CONCERNS

From the standpoint of policy makers who are aware and informed about the issues that arise in the current global society. Sound policy making requires determined and focused goals. No goal is more important than ensuring access to education by removing barriers. Global society must respond to forces within and without to embrace new approaches and emerging technologies. The policy concerns are effective curriculum planning involving sub-jects and instructors with interest in new approaches, emerging technologies and solid policies. Topics must be explored in multi-disciplinary ways, while not losing touch with the content, skills and assessment targets of the curriculum.

The curriculum must be built round a sequence of learning journeys. The scope and focus of each journey must be mapped. With these approaches, every subject begins with anticipation. The interest is to get learners inspired and make them want to know more. This approach gives clarity to the breadth of learning involved. In between the excitement, inspiration and the outcome. Offering a variety of approaches, including access through technologies, means that students do not give up when they encounter a problem. At the end of every

learning, students will be able to evaluate the experience in terms of the skills they have acquired or improved and the knowledge and understanding they have gained.

The body of literature points to the need for the preschool teacher to be placed crucially with regard to literacy learning in the early childhood years. Much of children's accumulated knowledge could be utilized in the transition process. The literacy curriculum in the early years of childhood must become seamless and ensure that children are engaged in satisfying literacy based activities on a regular and systematic basis. Professional development programs must be conducted on the issue of new approaches, emerging technologies and policy. Professional development programs must make sure that schools are certain about how to respond to these changes. So that the initiatives that are dispersed and are not inept, policy planners must al-ways clear obstacles that might prevent integration of new modes and emerging technologies into the education system.

CONCLUSION

We established that new approaches to learning and teaching are made possible by emerging technologies that complement and consolidate policy and further advance instruction and learning. The chapter showed that moving away from the traditional modes toward modest approaches of flexible, modular, and interoperable learning arrangements (Bush & Mott 2009) help schools, instructors, and learners. However, it would be ingenuous to suggest that by changing the traditional way of instruction and learning will result in teaching and learning improvements of any kind. As White, Ringstaff, and Kelley (2002) note, while new approaches and emerging technology are supporting and bringing change in education, they will have little impact without clear policies.

New instructional approaches and emerging technologies together with well-planned policy have been identified as an important tool for realizing a new paradigm of learner-centered education and content interaction that better supports learners' needs. Components such as providing interactive content, giving immediate feedback, identifying learners' needs, and having student electronic portfolios are critical elements in learner-centered instruction for learners (Reigeluth et al., 2008). Thus, new instructional approaches, emerging technologies and clear policy have the potential of greater success in the new paradigm shift. They remove traditional models, allow mixed models and open up learning thereby removing the barriers that stand in the way of innovation

and employ new learning methodologies.

The dialogue of methods to implement changes in the approach to teaching and learning come from the realization that often the attempts at reforming the education system tend to be ineffective. The attempts to use standardized testing in addressing the problems of the complex education system have never produced the best outcomes. Certainly, there are no simple general solutions to those diverse and complex problems. Undoubtedly, a mixed model with modest approaches offers a practicable solution. The above recommendations of some differentiated approaches are beneficial and can have significant positive effects on the teaching and learning process in education system.

In the modern world that is rapidly evolving, both the learner and the instructor must work hard and persist when there is an obstacle or change. Change is a major part of life, whether it is change in education or emerging technologies that have an impact on learning. Infusing teaching approaches with students' characteristics are critical steps toward solving the particularly difficult problems of instructional approaches and learning processes. Certainly, some difficulties are encountered not only by instructors but also by policy makers in the endeavor to adapt instructional changes to meet students' needs.

REFERENCE

Ackoff, R. L., & Greenberg, D. (2008). *Turning learning right side up*. Upper Saddle River, NJ: Wharton School Publishing.

Black, P. & William, D. (1998). *Inside the black box: Raising standards through classroom assessment*. London: King's College.

Brophy, J. (1988). Educating teachers about managing classrooms and students. *Teaching and Teacher Education*, 4, 1-18.

Bush, M., & Mott, J. (2009). The transformation of learning with technology. *Educational Technology,* 49(1), 3–20.

Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology/Psychologie Canadienne, 49*(1), 14-23. http://dx.doi.org/10.1037/0708-5591.49.1.14

Dziuban, C., Moskal, P., & Hartman, J. (2005). Higher education, blended learning and the generations: Knowledge is power-no more. In J. Bourne & J. C. Moore (Eds.), *Elements of quality online education: Engaging communities* (pp. 85-100). Needham, MA: Sloan Consortium.

Dziuban, C., Hartman, J., Cavanagh, T. B., & Moskal, P. D. (2011). Blended courses as drivers of institutional transformation. In A. Kitchenham (Ed.), *Blended learning across disciplines: Models for implementation* (pp. 17-37). Sterling, VA: Stylus. http://dx.doi.org/10.4018/978-1-60960-479-0.ch002

Green, H., & Hannon, C. (2007). Their Space: Education for a digital generation, online version, accessed August 4 2017, http://www.demos.co.uk/files/Their%20space%20-%20web.pdf

Guilford, J. P., Green, R. F., & Christensen, P. R. (1950). *A factor-analytic study of reasoning abilities*: *I. Hypothesis and description of test*. Report from the Psychological Laboratory, University of Southern California, Los Angeles.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77, 81–112. http://dx.doi.org/10.3102/003465430298487

Metcalfe J. (2009). Metacognitive judgements and control of study. *Current Directions in Psychological Science* 18:159-163

Moskal, P.D., Dziuban, C., & Hartman, J. (2010). Online learning: A transforming environment for adults in higher education. In T. T. Kidd (Ed.), *Online education and adult learning: New frontiers for teaching practice*s (pp. 54-68). Hershey, PA: IGI Global.

Opitz, B., Ferdinand, N. K., & Mecklinger, A. (2011). Timing matters: The impact of immediate and delayed feedback on artificial language learning. *Frontiers in Human Neuroscience*, 5(8). http://dx.doi.org/10.3389/fnhum.2011.00008

Reigeluth, C. M., Watson, W. R., Watson, S. L., Dutta, P., Chen, Z., & Powell, N. (2008). Roles for technology in the information-age paradigm of education: Learning management systems. *Educational Technology*, 48(6), 32–39

Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research*, 78, 153–189. http://dx.doi.org//10.3102/0034654307313795

Wang, M. C., Haertel, G. D., & Walberg, H. J. (1994). What helps students learn? *Educational Leadership*, 51, 74-79.

White, N., Ringstaff, C., & Kelley, L. (2002). *Getting the most from technology in schools*. San Francisco: WestEd. Retrieved from ERIC database. (ED471137)

White, W. F. (1990). Divergent thinking vs. convergent thinking - A GT anomaly. *Education*, 111(2), 208-213

The Role of Technology (Social Media) in Exploration Study Lesson at Elementary School Teacher Education Program

Muhammad Arief Budiman
Murywantobroto

ABSTRACT

The use of technology in teaching has become a natural thing lately. The purpose of this research is to know the influence of the use of technology in the exploratory study lesson in the elementary school teacher department, School of Education, University of PGRI Semarang. This research is qualitative descriptive. The subject of research is 45 students of fourth semester majoring in elementary school teacher department, School of Education, University of PGRI Semarang who take exploratory study lesson. Data collection tools use observation, interview and documentation. Data analysis techniques is using Miles and Huberman techniques. The results indicate that the use of technology in the lesson of exploration study is considered succesful seen from the students' responses. Students provide positive feedback regarding the use of technology, especially youtube social media as a medium of uploading final assignment. The students can provide an evaluation of the use of the technology they have experienced in exploratory study learning, but they still provide an abstract description when asked to explain the technology suitable for the learner in college. While the explanation they provide for the use of technology in primary school learning is a bit clear with the mention of examples. For that we still have to keep looking for the right technology to apply to the students in college.

***Keywords**: technology in education, social media youtube, exploration study*

INTRODUCTION

The world of education at the present time is very advanced and tight in the competition so the stakeholders in it that is the educational foundation must participate in a tight competition in maintaining its business which can be seen from the quality of service, learning innovation, and educational funds being set.

From various aspects, there are some problems. The problem in the world of education in general, in the learning process in particular is the lack of innovation. Innovation meant here is the concept of an interesting learning that can make the learning process becomes fun and interesting so that learners do not become bored in following the process of learning in the classroom. Students who are not bored will become active in participating in class lessons in the classroom. To create it, there needs to be innovation in the world of education, especially in the learning process that can create a fun learning process.

Based on description above, the solution is the use of technology in general and the use of social media in particular. The use of social media becomes an interesting thing because students who are younger generation cannot be separated from the reach of social media wherever they are. There are many social media used by the students, among others: Facebook, twitter, instagram, path, YouTube, and others.

Here being discussed is YouTube as one of the social media for the final assessment tool for students 4th semester Elementary School Teacher education Program, Faculty of Education, Universitas PGRI Semarang. From the practice initiated by this tutor, it was found that there were various responses from the learners who took the exploratory study course. Various responses are divided into two. The first is the abstract response for answering questions of what kind of technology they want that can be applied in education. The second is a rather clear response for answering questions of what kind of technology are suitable for children of elementary school.

TECHNOLOGY

Technology is a knowledge aimed at creating tools, action processing and extraction of objects. The term “technology” has been widely recognized and everyone has their own way of understanding the notion of technology. Technology is used to solve problems in our daily lives. Briefly we can describe technology as a product, process, or organization. In addition, technology is used

to expand our capabilities, and that makes people as the most important part of any technological system. (Supardan, 2010: 69).

Technology is also an application of science to solve problems. But what we must know is that technology and science are different subjects that work from hand-to-hand to accomplish a particular task or solve a particular problem.

Technology is applied in almost everything we do in our lives; We use technology in the workplace; We use it for extract material; We use technology for communication, transportation, studying, manufacturing, creating tools, securing data, business scale, and more. Technology is a human knowledge involving tools, materials, and systems. Application of technology produces tools or products. If the technology is applied properly, it can be beneficial to humans; but if incorrectly applied, it can cause damage to humans.

Many businesses use technology to stay competitive, they create new products and services using technology, and they also use technology to deliver products and services to their customers in a timely fashion. A good example is mobile companies like Apple and Samsung, these two electronics companies, using top-notch technology to create new smartphones and other electronic devices to stay competitive. This competitive advantage is obtained through the use of advanced technology.

MEDIA SOCIAL

Social media is an online medium, with its users can easily participate, share, and create content including blogs, social networks, wikis, forums and virtual worlds. Blogs, social networks and wikis are the most common form of social media used by people around the world. Another opinion says that social media is an online medium that supports social interaction and social media is using web-based technology that turns communication into interactive dialogue. (Briggs, 2006: 50).

Andreas Kaplan and Michael Haenlein define social media as “an internet-based application group that builds on the foundation of Web 2.0 ideology and technology, and which enables the creation and exchange of user-generated content”.

Social networking is a site where everyone can create a personal web page, then connect with friends to share information and communicate. The biggest social networks include Facebook, MySpace, and Twitter. If traditional media uses print

media and broadcast media, then social media use the internet. Social media invites anyone interested in participating by contributing and feedback openly, commenting, and sharing information in quick and unlimited time.

As internet and mobile phone technology is getting more advanced then social media also grows rapidly. Now to access Facebook or twitter for example, can be done anywhere and anytime just by using a mobile phone. People can access social media fast resulting in a big phenomenon against the flow of information not only in developed countries, but also in Indonesia. Because of the speed of social media, it also began to appear to replace the role of conventional media in spreading the news.

The rapid development of social media is now because everyone is like to have their own media. If to have traditional media such as television, radio, or newspaper required a large capital and a lot of workforce, then another case with the media. A social media user can access using social media with internet network even the slow access though, without big cost, without expensive tool and done alone without employees. We as users of social media can freely edit, add, and modify texts, images, video, graphics, and various other content models.

EXPLORATORY STUDY

There are various kinds of lessons in the Elementary School Teacher education Program, Faculty of Education, Universitas PGRI Semarang. The subjects are generally aimed to form learners to become a person who has a good character so that later they will be eligible to become teachers and deserve to be role models for their students later. In addition lessons in Elementary School Teacher education Program also aims to prepare the learners to have the provision of sufficient skills to become elementary school teachers. Various kinds of skills are implanted in the participants so that they will be able to master the demands of the work world that requires teachers with various skills.

One of the lesson in Elementary School Teacher education Program is exploratory study. This lesson aims to educate the learners to have the skills in the field, among them: observing, being structured, interviewing, socializing, being polite, being responsible, reporting, cooperating, being meticulous, being organized, and others. In exploratory studies, students are given the task to go to the field. In one class of 45 students, they were divided into five groups. This group takes place in one semester. Then they were given the task of 5 major projects which are all field projects: regional library observation, tugumuda observation, old

town observation, mangrove forest observation, and Bali observation. In these projects, all students / all groups must go to the field. They make observations, and at the end of the semester they make observation reports.

LEARNING MEDIA

The development of science and technology increasingly encourage renewal efforts in the utilization of technology results in teaching and learning process. Teachers are required to be able to use the tools that can be provided by the school, and it is not possible that the tools are in accordance with the development and demands of the times. Teachers may at least be able to use cheap and humble tools but are required in order to achieve the intended teaching objectives. (Arsyad, 2000: 41)

Besides being able to use the tools available, teachers are also required to be able to develop the available tools; teachers are also required to be able to develop skills to create teaching media that will be used if the media is not yet available.

Learning Media means everything that can be used to stimulate the mind, feelings, attention and ability or skills of learners so as to encourage the learning process. Meanwhile, according to Briggs (1977) learning media is a physical means to deliver content / learning materials such as: books, movies, videos and so forth. Then according to National Education Association (1969) revealed that the media learning is a means of communication in the form of printed media and audio visual, including hardware technology.

Definition of the learning media is all the teaching tools used to help conveying the subject matter in the process of teaching and learning so as to facilitate the achievement of learning objectives that have been formulated.

FOCUS GROUP DISCUSSION

The term FGD or Focus Group Discussion is currently very popular and widely used as a method of data collection in a social study. Then, what is the FGD? Simply FGD can be interpreted as a discussion conducted in a systematic and directed way about a particular issue or problem. FGD or Focus Group Discussion is a form of qualitative research in which participants can ask questions about their attitudes to the issues in the topics covered.

Meanwhile, according to Irwanto (1998) put forward his opinion on the definition of Focus Group Discussion is a process of collecting information of a particular problem which is specific through group discussion. According to Hening and Coloumbia (1990) mentioned that focus group discussions are interviews from a small group of people led by a resource person or moderator who subtly encourages participants to dare to speak openly and spontaneously about what is considered important related to the topic of discussion which is being discussed. (Irwanto, 2010: 33)

In FDG interaction among participants is a basis for obtaining information. Each participant has the same opportunity to file and post statement, respond to, comment or ask a question. The purpose of focus group discussions is to get input or information about the problems that are local and specific. While the settlement of the problem is determined by the other party after input is received and analyzed.

DISCUSSION

Technology cannot be separated from our lives in all aspects, including education. Technology in education is very helpful in the process of teaching and learning so that learners are able to obtain all the skills they have to master. It cannot be denied that the role of this technology is very helpful in that regard. Technology is also in line with the development of the era. In the present era, the condition of learners is different from the condition of learners in earlier times, the era before technology was rampant. Now everyone, including children (also learners) is addicted to technology (gadgets). This can be used by educational practitioners to create something innovative so that learners are able to follow what we want without having to let go of what they want (addicted to gadgets).

One of technologies that cannot be separated from children (learners) is social media. There are so many social media, among them: Facebook, twitter,

instagram, YouTube, path and others. Here it will be discussed about YouTube. YouTube is a free service to upload, download, and view videos online. There are various types of videos that exist on YouTube, including: music video, motivation video, teaching video, tutorials video, and others.

With the above description, then YouTube can be used in the learning process. In this case, it is in the learning process exploratory study lesson. The educational practitioner takes advantage of YouTube as a means of evaluating the final project for exploratory study courses. As described above, in the course of exploratory study the students are divided into several groups and they are given the task of five major projects. At the end of the assignment, students must gather their observations in the five major projects. Here the teacher brings the students to make the final report in the form of a video. And the teacher assigned them to upload the video to YouTube. The teacher assigns a score after the video has been successfully viewed online by the teacher.

The description above explains how the process of using technology (social media: YouTube) in the learning process in exploratory study course. Teachers take advantage of YouTube social media technology in the evaluation process. From the results of observations of researchers, the process is said to have a positive impact. The students become more thorough in making the final task due to their awareness that their final video-shaped task must be uploaded to YouTube where later the video will be accessible to all viewers from all over the world. With that awareness they want to make the final video the best they can.

While in the results of interviews, researchers found two types of feedback. The first is about their abstract responses when asked what type of technology they want for their learning process. They respond that they want technology that is fun, interesting, and good. The second is a rather clear response when they are asked about what kind of technology is suitable for elementary school children. They gave the answer that technology suitable for elementary school children is a game. Because children are still in development then they still love to play, with this awareness then the technology suitable for learning process in elementary school is the game. While the data from the documentation when they implement focus group discussion is the researcher found that there are some obstacles mentioned by the students related to the application of social media technology YouTube in learning exploration study course. Some of the obstacles are: (1) they have no credit to access the internet to upload their final assignment video, (2) when they use campus free Wi-Fi facility, sometimes connections are down (3) when uploading videos they take a long time because

the video file size is very large (4) when they make a video, they feel they do not have the maximum ability in editing, so they make the final video in a simple way (maximal in their capacity).

From the explanation, it can be seen that the use of YouTube social media technology in learning in exploratory study course is able to support the purpose of learning course that is this lesson aims to educate the students to have the skills in the field, among them: observing, being structured, interviewing, socializing, communicating, being courteous, being responsible, reporting, cooperating, being thorough, being organized, and others. (1) observation skill occurs when they go into the field and this can be seen from their final assignment video (2) structured skill is implemented with five pre meetings each before they go to the field for each project (3) Socializing / communicating skill is done successfully, they plunge into the field and communicate well and courteously with the people they meet in each of the places of assignment (4) responsible accountability is done with the success of the students' visits to several assignment places where the student is able to take responsibility not to do any damage in those places and they are also responsible for bringing the good name of the institution in public (5) the cooperation skill is accomplished by group discussion to make the observation instrument before entering the field, the cooperation is also done when the students do the observation in the field, besides that cooperation is also carried out when they make the final report (6) the ability to report executed with the creation of final project video that has been uploaded on YouTube (7) skill to be meticulous is executed by the students successfully make the final report well and true (8) skill to be organized is done successfully with the success of the students accommodate the tasks in accordance with the procedures of the arrangement of the assignment.

CONCLUSION

From the above explanation it can be concluded that this is a reflective research in which the study presented in this presentation is all things that have been implemented by teachers who are also domiciled as a researcher. From the existing explanation, it can be concluded that the use of YouTube media social technology as a means for evaluation in the course of exploratory study is said to succeed. This is shown from the response of the students when researchers collect data by methods of observation, interviews, and documentation. The student's response is positive for the application of social media technology YouTube in the learning process of exploratory study course. Another effect that

researchers get from the observation is the increase of student creativity in order to make the final report in the form of video. This is due to their awareness that the final report in the form of the video will be uploaded to YouTube which will be accessible to all viewers from all over the world. So with that awareness they are trying their best to make videos as well as possible.

REFERENCES

Arsyad, Azhar. 2000. *Media Pengajaran*. Jakarta: Raja Grafindo Persada

Briggs, Asa . 2006. *Sejarah Sosial Media*. Jakarta: Yayasan Obor Indonesia

Emzir. 2010. *Metodologi Penelitian Kualitatif: Analisis Data*. Jakarta: Rajawali Pers.

Irwanto. 2010. *Focused Group Discussion*. Jakarta: Yayasan Obor Indonesia

Supardan. 2009. *Ilmu, Teknologi Dan Etika*. Jakarta: BPK Gunung Mulia

E-LEARNING

Evaluation of E-learning Activity Effectiveness in Higher Education Through Sentiment Analysis by Using Naïve Bayes Classifier

Eka Angga Laksana
Ase Suryana
Ai Rosita
Heri Heryono

ABSTRACT

Sentiment analysis as part of text mining research domain has been being recognized due to the successful implementation in social media analysis. Sentiment analysis methods had intelligent ability to classify texts into negative or positive. Classified texts concluded whole users respond and described opinion polarity about particular topic. Based on this idea, this research took e-learning's users opinion as object to be measured through sentiment analysis. The results can be used to evaluate the e-learning activity. This research had been implemented in Widyatama University which had been running e-learning activity for several years. Qualitative method by given questioner to users and gather the feedback is commonly used as evaluation of e-learning system previously. Still, questioner doesn't represent the conclusion about the whole opinion. Hence, it needs the method to identify opinion polarity from e-learning member. The e-learning opinion data sets were gathered from questioner filled by e-learning member included both student and lecturer as participants. The participants gave review about learning outcome after their participation in e-learning activity. Their opinion was needed to describe current situation about e-learning activity. Therefore, the conclusion could be used to make improvement and

described few achievements about the e-learning system. The data sets trained by Naïve Bayes classifier to group each user respond into negative or positive. The classification results were also evaluated by a number of particular evaluation metric used in data mining to show the classifier performance such as accuracy, precision, and recall.

Keywords: *classifier, evaluation, e-learning, sentiment, naïve bayes*

INTRODUCTION

The rapid growth of the internet based technology leads to revolution in education area. The traditional face to face learning changed by web based learning and relieve distance during learning process (Guri-rosenblit, 2005). Web based learning which known as e-learning system has numerous approach in different educational level. Now days a lot of educational institution offering e-learning as part of learning activity especially in higher education (Garrison & Anderson, 2011; Guri-rosenblit, 2005). E-learning system defined as the improvement of teaching quality through multimedia and internet technologies. E-learning not only provide teaching material and educational service but also evaluation scheme, exchange information and collaborative learning between student and lecturers (Dominici & Palumbo, 2013; Nichols, 2008). The main purposes behind Education institutions use the e-learning technology is to improve learning outcomes. They believe that more participation, self-regulated and interactive communication are considered as key factor to improve learning outcomes (Garrison & Anderson, 2011; Persico, Manca, & Pozzi, 2014). Recently, e-learning platforms also introduced in public administrations and corporations to make learning quality better than traditional teaching (Stoffregen, Pawlowski, & Pirkkalainen, 2015; Violante & Vezzetti, 2013).

E-learning effectiveness contain detailed information based on evaluation result of e-learning system. It can lead to reflection and revision of the learning approach adopted in educational institutions (K. Lee, 2005; Novo-corti, Varela-candamio, & Ramil-díaz, 2013). Usually educational institutions do the assessment into their e-learning system to know the effectiveness which useful to know learning outcomes that has been achieved and possibly compared current or previous method and approach. E-learning effectiveness sometimes difficult to measure empirically without controlling all involved variable which still difficult to do in

real environment. This paper purposes to perform the analysis of the e-learning system effectiveness based on personal feedback retrieved from both student and teacher. We believe that "what other people think" has become important piece of information for the people during decision making process(Pang & Lee, 2008). Therefore, the personal impression retrieved from student and teacher could be a good indicator about e-learning effectiveness and also useful for top level management to create decision.

Sentiment or opinions are key of our activity, because human behavior influenced based on it. Human decision sometimes influenced by the other opinion. In the real world, organization and business always try to improve their product and service by finding out about customer's opinion. It is commonly happened because customer always want to know about another opinion of a product before purchasing it. This paper conducted based on this idea, whether the e-learning participant opinion would lead to proper advice for decision making process.

The remainder of this paper is organized as follows: Review of literature on e-learning evaluation and previous research in sentiment analysis; Discusses the research method of this study included data preparation and experimental setup; Discusses the experiment result and analysis; Finally summarize the result and suggest the possibility for the next research.

REVIEW OF LITERATURE

Research in e-learning becomes interesting as more and more higher education in the world wide has been used e-learning system for their course delivery and tried to comprehend how effective and usable related to interaction between human and computer (Bringula, 2013; Escobar-rodriguez & Monge-lozano, 2012; Navimipour & Zareie, 2015). Positive user experience could indicates the acceptance, satisfactions and efficiency of academic institutions (Hubackova, 2014). The system itself is not adequate to sustain new educational approach like e-learning, therefore higher education must understand and learn whether users have got positive or negative experience during their study(Laurillard, Wasson, B., & Hoppe, 2009; Persico et al., 2014). E-learning system meet the requirements when users satisfy and feel positively (Capece & Campisi, 2013; S. M. Lee, Kim, & Lee, 2016; Yeh & Lin, 2015).

About Moodle

Moodle originally design by Martin Dougmias, was released on 20 August 2002. Moodle is known as robust open source e-learning platform was developed by collaboration effort of international community. Until now, Moodle e-learning platform still continually improved to give teacher, administrator and student with a stable, secure and increased learning experience. Currently, Widyatama University adapt "Blended Learning" as e-learning method approach. Blended Learning is learning approach that uses both face-to-face and e-learning(Graham, 2003). Classroom based teaching enable the student to consolidating their skill and knowledge. It usually held on first and near exam meeting, while the online learning has been held at the rest schedule. Online learning by Moodle allows the student to gain the resource and doing activity to make sure that they can revise their works, discuss in forum and involve in quiz.

METHODS

The data was collected from e-learning system at Widyatama University. We create questionnaire form opened 5 January 2017 and closed on 4 February 2017. The questions were asked to the e-learning participant from both teacher and student through questionnaire form. The whole of Participants was recently use moodle e-learning platform as learning activity in Widyatama University. They are registered e-learning member on running semester which have been enrolled in moodle class during running semester. The participants must fill their opinion about e-learning system that they have experienced before.

The e-learning user's response corpus has 272 positive and 168 negative sentences. This research has used 4/5 of them as training set, and the rest as test set. This constructs dataset containing 351 training instances and 89 test instances. The naïve Bayes classifier training method has created a token list in the form of [(feats, label)], where feats is feature dictionary and label the classification label. Feats contains {word:True} and label will be 'positive' or 'negative'. This study, we assume the corpus as direct opinions. They are easier to handle, otherwise indirect opinions often needs more time to deal with(Liu, 2012). For evaluation methods, this study uses nltk.classify.util.accuracy, nltk. precision, nltk.recall and nltk.f_measure library (Steven, Klein, & Loper, 2009).

This research uses NLTK (Natural Language Toolkit), a python based programs which known as platform to work with human language data (Steven et al., 2009). Naïve bayes has been used as base classifier algorithm to train corpus.

The experiment which has been conducted in this research follows a number of steps as described below:

Collect the data through questioner, as explained before that questioner form has been distributed to e-learning participant for both student and teacher in certain periods of time.

Data preprocessing, retrieve the participant's feedback. Create separation manually toward dataset into positive and negative corpus.

Feature extraction, decide the relevant feature for classifier by selecting specific words.

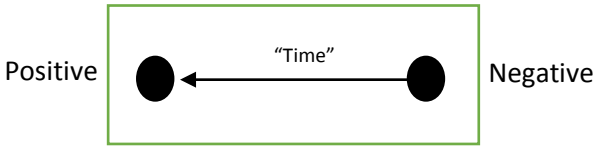
Training and testing dataset, cutoff for both positive and negative corpus as much as 80% for training set and 20% for testing.

Classify using naïve Bayes classifier, implements machine learning algorithm to learn word pattern that represent sentiment.

performance evaluation, perform the evaluation scheme include accuracy, precision, recall and F-measure metric.

Conclude the sentiment result, extract the most important feature based on classification result, useful for higher education to create decision for future improvement on e-learning system.

Naïve Bayes Classifier



Above figure illustrate training corpus which most classified into negative so the classifier starts closer to the" negative" label. In this example, the input document contains the word "time" which strong indicator for "positive" label. After each feature has made its contribution, the naïve bayes checks which it is indicated to, and defining that label to the input. For example, the word "time" occur in 80% of the positive document, 20% in negative document. Calculated likehood score, by multiplied by 0.8 for the positive label and 0.2 for negative label. The whole effects, will be to decrease the score of the negative more than positive label.

Naïve bayes algoritm creates classification by finding the probability for a label. First, it uses the Bayes rule define Q (label|features) in term of Q (label) and Q(features|label) and N(feature|label)

$$Q(label|features) = \frac{Q(label) * Q(features|label)}{Q(features)}$$

(1)

Naïve Bayes algorithm then makes the 'naïve' assumption which whole features are independent as formulated below:

$$Q(label|features) = \frac{Q(label) * Q(features|label) * \ldots * Q(fn|label)}{Q(features)}$$

(2)

Then for each label, the algorithm calculates the numerator and normalized them by sum to one as represented in the following formula:

$$Q(label|features) = \frac{Q(label) * Q(features|label) * \ldots * Q(fn|label)}{sum[l](\ Q(l) * P(f1|l) * \ldots * P(fn|l))}$$

(3)

Accuracy has been commonly used to evaluate a classifier. It shows the percentage of test set which is correctly labeled. In this study uses nltk.classify.accuracy(Steven et al., 2009) to calculate the accuracy classified sentiment on a given test set.

Since sometimes the number of relevant document lower that irrelevant document, the accuracy scores for irrelevant labeled document would be near to 100%. Therefore, there are four terms to represent different set of measures. Relevant items correctly identified as relevant defined as "True positives" (TP). irrelevant items which correctly identified as negative defined as "True negative" (TN). "False positive" (FP) defined as irrelevant items that are incorrectly identified as relevant, and finally "false negative" (FN) as relevant items which is incorrectly identified as irrelevant.

Precision and recall is another performance evaluation which tried to overcome shortcomings of accuracy. Because sometimes accuracy can be misleading in "search task" while attempting to find data which relevant to an appropriate task. Precision indicates the number of relevant items which identified were

relevant, with the formula is *TP/(TP+FP)*. Recall shows the number of relevant items which successfully identified by the formula TP/(TP+FN). F-measure (F-score) combined by precision and recall, also defined as harmonic mean of precision and recall by the formula (2 x precision x recall) / (precision + recall).

RESULTS AND DISCUSSIONS

Accuracy

After the evaluation process, the algorithm shows accuracy on 87.5%. It means 87.5% was correctly labelled on the test set.

Precision, Recall and F-Measure

As shown on table 1, 93% recall means every user's responses that has identified positive correctly. Very few false negatives in the positives class. Correct positive classification identified with 87% positive precision and the rest 13% identified as false positive for positive label. Negative precision as 87.9% indicates very few false positive for the negative class. Relatively high recall causes about 23% false negative for negative label. F-Measure shows weighted harmonic means between precision and recall.

Informative Features

Table 1. Precision and recall score

pos precision:	0.872852233677
pos recall:	0.933823529412
pos F-measure:	0.902309058615
neg precision:	0.879194630872
neg recall:	0.779761904762
neg F-measure:	0.826498422713

Table 1 shows the most informative feature which affect the sentiment degree. The table only shows ten informative features sorted by their ratio in feature label. The table also shows that the training set which contain the word “kuis” reaches 13.5 labeled as negative more often than positively labeled. Another feature is the word “forum” also labeled as negative more than positive as much as 10.7 times higher.

Table 2. Most informative feature

word	Feature label	
contains(kuis) = True	negative : positive =	13.5 : 1.0
contains(forum) = True	negative : positive =	10.7 : 1.0
contains(quiz) = True	negative : positive =	10.2 : 1.0
contains(kurang) = True	negative : positive =	10.1 : 1.0
contains(sulit) = True	negative : positive =	9.2 : 1.0
contains(tetapi) = True	negative : positive =	9.2 : 1.0
contains(ketika) = True	negative : positive =	8.1 : 1.0
contains(dosen) = True	negative : positive =	7.9 : 1.0
contains(apalagi) = True	negative : positive =	7.0 : 1.0
contains(menggunakan) = True	negative : positive =	7.0 : 1.0

Table also shows the result that needed by top level management to create decision making. The words that appear in most informative feature can be analyzed to find the major drawback on current e-learning system. In addition, selecting relevant feature and deciding how to handle with it for learning process leads into learning model ability to create a good model. In this study, we use a fairly simple and obvious set of features which is carefully constructed during data preparation. Typically, feature extraction involves trial-and-error process guided by intuition about what information is correct related to the problem.

CONCLUSION AND SUGGESTIONS

In this paper, we have performed classification on e-learning participant's opinions. The opinion datasets have been labeled into positive and negative which divided into training and testing set. Naïve Bayes algorithm has been used as learning method and shows the accuracy by 87.5%. Another evaluation also performed with precision, recall and F-measure to represent relevant and irrelevant document and they show a good result. It means the model has been successfully used to classify opinion and extract the most important features to be used by top level management to create decision making. The critical point that represent drawback and effectiveness has been shown on Table 2. More analyzed by using simple statistic can be used by utilizing each word contained in the most informative feature as the main keyword to create improvement and learning outcome achieved by student. Another improvement could be made to achieve better result since this study focus on direct opinion. As suggestion for the research, the different type of opinion method can be used to improve machine learning ability.

REFERENCE

Bringula, R. P. (2013). Computers & Education In fl uence of faculty- and web portal design-related factors on web portal usability : A hierarchical regression analysis. *Computers & Education*, *68*, 187–198. https://doi.org/10.1016/j.compedu.2013.05.008

Capece, G., & Campisi, D. (2013). User satisfaction affecting the acceptance of an e-learning platform as a mean for the development of the human capital, (April), 37–41.

Dominici, G., & Palumbo, F. (2013). How to build an e-learning product : Factors for student / customer satisfaction. *Business Horizons*, *56*(1), 87–96. https://doi.org/10.1016/j.bushor.2012.09.011

Escobar-rodriguez, T., & Monge-lozano, P. (2012). Computers & Education The acceptance of Moodle technology by business administration students.

Computers & Education, *58*(4), 1085–1093. https://doi.org/10.1016/j.compedu.2011.11.012

Garrison, D. R., & Anderson, T. (2011). E-Learning in the 21st Century A Framework for Research and Practice.pdf. Taylor & Francis.

Graham, C. R. (2003). DEFINITION, CURRENT TRENDS, AND FUTURE DIRECTIONS.

Guri-rosenblit, S. (2005). Eight Paradoxes in the Implementation Process of E-learning in Higher Education, 5–29. https://doi.org/10.1057/palgrave.hep.8300069

Hubackova, S. (2014). Effectiveness and evaluation of on-line courses. *Procedia - Social and Behavioral Sciences*, *143*, 139–142. https://doi.org/10.1016/j.sbspro.2014.07.375

Laurillard, D., Wasson, B., M., & Hoppe, U. (2009). *Implementing technologyenhanced learning. In Technology-enhanced learning*.

Lee, K. (2005). E-Learning : The Quest for Effectiveness, *2*.

Lee, S. M., Kim, Y. R., & Lee, J. (2016). An Empirical Study of the Relationships among End-User Information Systems Acceptance , Training , and Effectiveness An Empirical Study of the Relationships among End-User Information Systems Acceptance , Training , and Effectiveness, *1222*(April). https://doi.org/10.1080/07421222.1995.11518086

Liu, B. (2012). Sentiment Analysis and Opinion Mining, (May).

Navimipour, N. J., & Zareie, B. (2015). Computers in Human Behavior A model for assessing the impact of e-learning systems on employees ' satisfaction, *53*, 2011–2013.

Nichols, M. (2008). Institutional perspectives: The challenges of e-learning diffusion, *39*(4), 598–609. https://doi.org/10.1111/j.1467-8535.2007.00761.x

Novo-corti, I., Varela-candamio, L., & Ramil-díaz, M. (2013). Computers in Human Behavior E-learning and face to face mixed methodology : Evaluating effectiveness of e-learning and perceived satisfaction for a microeconomic course using the Moodle platform. *Computers in Human Behavior*, *29*(2), 410–415. https://doi.org/10.1016/j.chb.2012.06.006

Pang, B., & Lee, L. (2008). Opinion Mining and Sentiment Analysis, *2*, 1–135.

https://doi.org/10.1561/1500000001

Persico, D., Manca, S., & Pozzi, F. (2014). Computers in Human Behavior Adapting the Technology Acceptance Model to evaluate the innovative potential of e-learning systems. *Computers in Human Behavior*, *30*, 614–622. https://doi.org/10.1016/j.chb.2013.07.045

Steven, B., Klein, E., & Loper, E. (2009). *Natural Language Processing with Python*.

Stoffregen, J., Pawlowski, J. M., & Pirkkalainen, H. (2015). Computers in Human Behavior A Barrier Framework for open E-Learning in public administrations. *COMPUTERS IN HUMAN BEHAVIOR*. https://doi.org/10.1016/j.chb.2014.12.024

Violante, M. G., & Vezzetti, E. (2013). Virtual Interactive E-Learning Application : An Evaluation of the Student Satisfaction, 72–91. https://doi.org/10.1002/cae.21580

Yeh, Y., & Lin, C. F. (2015). Aptitude-Treatment Interactions during Creativity Training in E-Learning : How Meaning-Making , Self-Regulation , and Knowledge Management Influence Creativity, *18*, 119–131.

Starting an Online Class Exchange: Gains, Fails, and Future

Mikio Fuse

ABSTRACT

This paper reviews the results of the two web meeting sessions my Film Study seminar students had this spring with the Play Performance classes of Dr. Ouda Teda Ena and Mr. Krisna Septa of Sanata Dharma University, Yogyakarta. Dr. Ouda and I met at the ASEACCU [Association of Southeast and East Asian Catholic Colleges and Universities] conference in the previous year. It was the first experience for both parties to organize an online class exchange event.

The primary reasons I sought my partner in ASEACCU affiliate schools were the assumptions that students sharing the common Asian cultural backgrounds but speaking different first languages would be positively motivated to communicate in the common second language (English), and that the minimum time difference between the schools located along the Northeast and Southeast Asian axis would give more chances to organize real-time web meeting events. Both expected vantage points, however, proved not very easy to gain in practice.

In this paper, I would identify a couple of basic problems we faced in our first online class exchange experience: the difference of class periods, the asynchronous learning curves due to unparallel semester periods, and the apparent imbalance of overall second-language competence. For all these problems, I would suggest how they should be addressed to make such future online class exchange

events more successful, sustainable, and mutually profitable.

Keywords: *arts, online class exchange, synchronous computer-mediated communication, telecollaboration, video conferencing,*

INTRODUCTION

In spring 2017 my 3rd-year Film Study seminar students had two web meetings on Google Hangouts with the Play Performance class students of Dr. Ouda Teda Ena and Mr. Krisna Septa of Sanata Dharma University, Yogyakarta. When I first met Dr. Ouda at the ASECCU conference in summer 2016, he told me of his Play Performance classes, which sounded very fascinating, particularly because his practice involved not just L2 education but education of (and through) arts. I suggested that his classes would be a good partner for my Film Study seminar students' virtual international class exchange experience, and Dr. Ouda kindly agreed to do something together. Besides our shared interest in arts, the minimal time difference (Tokyo is 2 hours ahead of Yogyakarta) and the availability of the common second language (English) were expected to positively motivate and promote our interaction.

REVIEW OF LITERATURE

In the history of criticism on the educational use of international SCMC [Synchronous Computer-Mediated Communication], the 2010s seem to be marking the latest watershed. While the studies on the subject in earlier decades were mostly concerned with text-based telecollaboration between native speakers and non-native learners of English (and other target languages) for the purpose of enhanced language learning, O'Dowd (2016), reporting on an international conference held in Dublin in 2016, notes some significant new trends and directions, including "the emergence of video conferencing as an important tool for online intercultural interaction" (291), "the shift of focus from language learning to culture-and-language learning" (293), and the growth of "lingua franca exchange" approach (296) in which non-native partners (as against non-native speakers paired with native speakers) use English as a currency in today's globalizing world. It is encouraging to find our project locatable in these latest critical contexts.

Another study that encourages our project, especially after encountering a number of unexpected difficulties in the first exchange experience, is O'Dowd

and Ritter (2006) who say, "it is by now well established that telecollaborative exchange frequently end in 'failed communication' and do not automatically bring about successful negotiation of meaning between the learners" (623). They suggest 10 different fail factors at 4 different levels. They list them, not because they are to be avoided or eradicated, but because they are precisely the "cultural rich-points that we want our students to explore" (Belz, 2003, ctd. in O'Dowd and Ritter, 2006, 639).

It may be argued that students should not be unguardedly exposed to such fail zones, however culturally rich, but teachers who organize virtual intercultural exchange events should be prepared to recognize such fail factors and plan proactively in such ways that only teachers can do. The teachers' professional responsibility includes the recognition of "institutional fault lines" in whose exploration the teachers involved should become "intercultural learners" (Belz & Müller-Hartmann, 2003).

METHODS

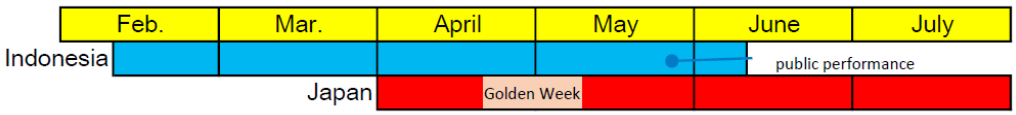
In this report I will describe how we prepared and realized the two web meeting events, what were the gains and fails of the experience from my point of view. In examining the causes of apparent fails, I will refer to the above-mentioned O'Dowd & Ritter (2006) as a frame of reference. Because the project is still in the fledging stage, how we can improve and develop our virtual class exchange project is the most important consideration. As the first move of the intercultural learning teachers' renewed dialogue, I will conclude this report by offering some suggestions for the future. It is to be followed up by Dr. Ouda later this year in a paper to be read in Yogyakarta.

RESULTS AND DISCUSSIONS

In preparation for the first web meeting event, Dr. Ouda and I started to contact each other in late January. We informed each other about the contents and schedules of our individual courses, and what our students might be interested to do on the online class exchange.

Through our email correspondence I learned that Dr. Ouda was going to pick up six one-act comedies written in or translated to English, such as Percival Wilde's *The Sequel* and Anton Chekhov's *The Proposal*, to be produced by six student groups of his and Mr. Krisna's classes. Their course was to conclude with the

public performance of the students' plays. In my turn, I informed Dr. Ouda that I was going to pick up a number of short films on *Viddsee.com* that were made by mainly Asian independent filmmakers. We were to study the films, compare them, and produce students' own films inspired by the works they studied. With the interaction with Indonesian students in view, I had chosen a number of works by Indonesian and Japanese filmmakers.



For the course calendar, I learned that Dr. Ouda's Friday class and Mr. Kristna's Wednesday class were scheduled to start in mid-February and end in late-May or early June. This revealed our first institutional fault line, for my seminar was scheduled to start in early April and end in late July. As *Figure 1* shows, there is only a little more than two months' overlap. What is more, our school has the "Golden Week" holidays from late April to early May, so it is only after the holidays that my seminar students are expected to get used to the coursework, to say nothing of getting ready for the online class exchange. The first online meeting has to be set definitely after the Golden Week holidays.

Eventually, the date for the first web meeting was set on Friday, May 12, 2017. There was, however, another institutional fault line to be negotiated. It was lucky that both Dr. Ouda's class and my class fell on Fridays, but our class periods did not overlap. While my seminar started at 13:30 and ended at 15:00 Japan Time, Dr. Ouda's class started at 14:00 and ended at 16:30 Jakarta Time, that is from 16:00 to 18:30 Japan Time (Figure 2):

Figure 2. Unparallel class periods

As it proved that Dr. Ouda's class had no other option, I asked my seminar students about their availability of the 5th period that did overlap with Dr. Ouda's class. None had the 5th period class to attend, but not a few of them had previous

engagement, including part-time jobs. However, all but one managed to change their schedules and joined the web meeting.

Because this was going to be the very first time for both of us to do this kind of international online class exchange, Dr. Ouda and I agreed to make no rush and organize the event in a relaxed way. Before anything, students would like to simply get to know each other and introduce what they are working on. As the web meeting day approached, Dr. Ouda and I made a couple of prearrangements to help our students get to know each other. First is to exchange the snapshots of our classes. Second is to assign student MCs on both sides. In the last minute chat with Dr. Ouda, I learned that his student MCs had a number of questions ready, so we decided that we leave the Indonesian students to lead the exchange event. Third is to ask Dr. Ouda if some of his students could make selfie videos to tell what they had been doing so far. Eight of his students, all belonging to the same group working on the play *The Sequel*, created individual self-introduction videos. Unfortunately I received the videos so shortly before the first web-meeting that my students had no time to watch them in advance.

The first moment of meeting each other online was hilarious, and that is the beauty of web-cam based, as against text-based SCMC. By simply waving hands and calling "hello" to each other, both groups of students sent positive signs of their willingness to be on the same page. As the event proceeded, however, I soon came to realize that there was a third fault line in this international exchange. My Japanese students' skills and style of communication in English evidently fell out of tune with their Indonesian partners. While the Indonesian students consistently spoke and responded actively, full of verbal and nonverbal expressions, my students sat quietly and almost always fell quieter before speaking and responding, when they managed to respond at all. In fact they frequently "froze" and left many questions unanswered. To be sure, when they were asked what they had been doing in class, they had not much to tell because my class had met only three times by then, but even when they were asked such questions as "what is it like to study at a women-only school?," "what do you do beside your school work?," "what is your hobby? What do you think of Korean movies?," my students lost all these conversation cues and failed to respond. When the one hour meeting ended, many of my students said they were sorry, and I felt sorry for them and for Dr. Ouda and his students. When Dr. Ouda wrote to me soon after to tell that his students wanted to meet us again, I felt heartily relieved and encouraged.

So we arranged to meet online again two weeks later on June 2. In view of the

second meeting, Dr. Ouda and I made another arrangement. Because this was our second meeting, we thought we might go deeper than the first meeting and talk about our subjects of study. Dr. Ouda was kind enough to get his students involved in the *Viddsee* videos by choosing three videos, asking his students which they liked best and why, as well as asking about the difference between play performance art and film art. I added the three videos in my seminar's study assignments and had a class discussion on the difference between the two arts. Unfortunately, only one of my seminar students said she could attend this time, but I had a list of comments and questions of all the other students about Dr. Ouda's *Viddsee*-related assignments, as well as about the 8 Indonesian students' selfie videos we had received earlier and had watched by then. The list of all my seminar students' comments and questions were written down on the whiteboard of the web conference room, to be consulted as appropriate by the single student who represented my seminar on the meeting day.

The above arrangement, however, was thwarted by another unexpected fault line, the technical failure that happened on June 2. When we met a week later, Dr. Ouda and Mr. Krisna's classes had already ended, so they recruited seven volunteer students (with the promise of a treat of pizza after the meeting). It proved that the students Dr. Ouda gave the *Viddsee*-related assignments were not among them, nor were the students of *The Sequel* group who created the selfie videos. So we eventually spent most of the hour listening to the Indonesian students talk about their final public performance, and asking questions about it. Although the Japanese student (and a friend of hers she invited to join) listened most of the time, they were good listeners, voluntarily asked some good questions, and we did have a rapport we missed on the first meeting. Unlike the first meeting Dr. Ouda and I positively intervened this time, and that also added to the rapport. While apologizing for the absence of those students who did the *Viddsee* assignments, Dr. Ouda kindly answered my student's question about traditional Javanese banana cake, *nagasari*, which was one of the film titles my seminar students had watched and discussed. For the Indonesian students, they spoke and responded as actively as the last time, and I also noted a few more points to prove they are good communicators. When asked about their costume in their public play performance, one of the students voluntarily took out his smartphone, opened the photo gallery, and turning the monitor towards the webcam as he selected this picture and that, answered the question very effectively. It may be a matter of course for him to use multiple media in this way, but to us he looked very smart. Their teamwork also impressed us. When any of them happened to be at a loss to come up with the right word to say,

the others always gave a friendly support, so there was apparently no fear of "freezing."

Although neither of the two web meetings proceeded as I had foreseen, the experience taught me and my students a number of good things we would never have learned otherwise. First of all, we were very much impressed by the Indonesian students' high communication skills. It includes a good command of English, of course, and the credit goes to the efficient English Language Education Study Program of Dr. Ouda and his colleagues that endows the students the ease and confidence to speak English. What's even more remarkable is their active and lively communication style in which they are not only good speakers individually but know how to help each other and enjoy creating the conversational rapport together. Last but not least, we were very much impressed by the confidence with which they can talk about what they have been doing, in- and off-class. It also proves that the English Language Education Study Program of Sanata Dharma Unversity is successful not simply as an L2 education program *per se* but in empowering students to speak and act as active agents in society with a solid awareness of their mission. I particularly remember the selfie video of a student who said, "if some day I will be a teacher and my students have an opportunity to show a drama, I absolutely can help them to prepare it because I have experiences of a drama."

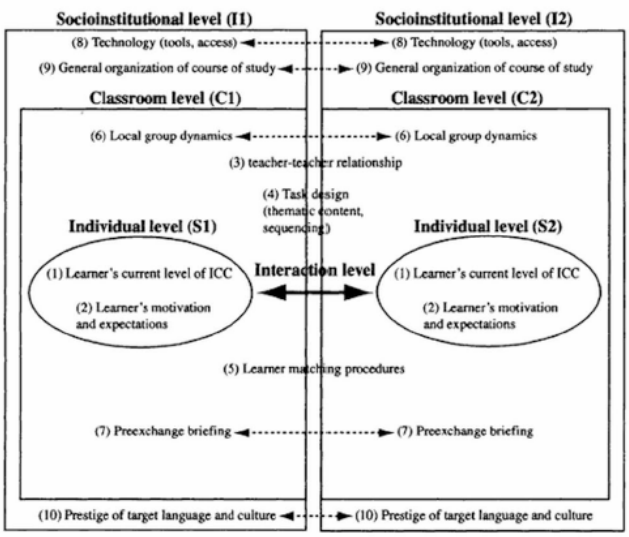


Figure 3. "Inventory of Reasons for Failed Communication in Telecollaborative Projects" (O'Dowd & Ritter, 2006)

Having mentioned the major gains we had with the synchronous international class exchange with Indonesian students, I would like to identify a number of fault lines that led to apparent fails in the first two web meeting events and consider how to plan for the future proactively. The first and most difficult obstacle was definitely "the misalignment of academic calendars" of the two schools that constitutes the very basic "institutional fault line" (Belz & Müller-Hartmann, 2003). In O'Dowd & Ritter's table of the "Reasons for Failed Communication" (*Figure 3*), the obstacle is to be located in the "socioinstitutional" difference of the two schools' "(9) General organization of course of study." For the difference of class periods (see *Figure 2* above), I will probably be able to move my seminar to the 5th period to make it overlap with Dr. Ouda's class, but that would not solve the more basic problem of the "unparallel semester periods"

(see *Figure 1* above). Because they cannot be changed arbitrarily by individual teachers, the limitation will remain to condition both the number of times we can meet (3 times at most) and the amount of things my students, as late starters, can show and tell about their own class activities. One suggested scenario for better future meetings would be for Dr. Ouda and I to develop a shared "(4) task design (thematic content, sequencing)" that keeps our students engaged in a more focused and equally sharable tasks. For example, Dr. Ouda may choose a couple of short scenes from his students' plays for my seminar students to practice for a couple of weeks before the meeting, and on the meeting day, the Indonesian student directors and players who have been working on those plays may want to comment, demonstrate and coach my students. In return, I (and Dr. Ouda) may choose a couple of *Viddsee* videos for both Indonesian and Japanese students to study and discuss beforehand, and on the web meeting we may exchange our opinions about the stories, cultural backgrounds (Indonesian, Japanese, or any other country's), acting, camerawork, etc.

Added to the imbalance on the socioinstitutional level, the difference in the "(1) Learner's current level of ICC [Inter Cultural Communication]" proved to be an equally marked fault line, as the moments of my students' "freezing" typically demonstrates. To be sure, on the "individual level" some of my students have very low competency in English, including one who, after attending the first web meeting, said she couldn't understand the questions Indonesian students were asking. However, it is also true that most of my students, including those who have relatively high skills in English, did understand the questions but simply didn't know how to respond in English on the spot. If they did not understand the questions, they could at least have been taught what to say in such a case, but if they did understand the questions, how can they be encouraged to express

themselves and remain on the same page with their conversation partners? As O'Dowd & Ritter argue, failure comes from "a combination of interconnected factors" (625), so the solution may not come easily. However, I would rather stay optimistic, because it is thanks to the international exchange that I, as a teacher, became aware of a number of weaknesses in my education style and method on "individual," "class" and "socioinstitutional" levels and came to realize the urge to improve them. For my students, I simply trust them, believing if they are given tasks more focused than this time and given opportunities to try and practice in advance saying what they want to say, and if they are eventually exposed to and involved in the positively communication-friendly "(6) Local group dynamics" of Indonesian students on the web meeting, they will have a much better chance of proving themselves.

CONCLUSION AND SUGGESTIONS

While Dr. Ouda and I kept corresponding to each other before the web meetings, the results were not (and in some points not so good) as we had expected. It reveals the sober reality that keeping a good "(8) teacher-teacher relationship" does not necessarily promise a good result. Apparently, as "teacher-learners," we should keep watching out for all possible fault lines and keep discussing them. The suggestions I made here may or may not be endorsed by Dr. Ouda, but this review from my side of the fault lines would have opened up things that cannot be adequately communicated through email. I hope this starts our renewed dialogue for an even more exciting future.

ACKNOWLEDGEMENT

I would like to thank Dr. Ouda Teda Ena and Mr. Krisna Septa of Sanata Dharma University, Indonesia, for their sustained good-will in realizing our international online collaboration. I would also thank Dr. Cecilia T. Murniati and Dr. Ridwan Sanjaya of Soegijapranata Catholic University, Indonesia, for their earlier communications about possible online exchange projects with us, and for giving me this opportunity to speak at the ICLT 2017 conference.

REFERENCE

Belz, J. (2003). Linguistic perspectives on the development of intercultural competence in telecollaboration. *Language learning & technology*, *7* (2), 68-99. Retrieved from http://llt.msu.edu/vol7num2/BELZ/default.html

Belz, Julie A., & Müller-Hartmann, Andreas. (2003). Teachers as intercultural learners: negotiating German-American telecollaboration along the institutional fault line. *The Modern language journal*, *87*(1), 71-89.

Farr, Fiona, & Murray, Liam (Eds.). (2016). *The Routledge handbook of language learning and technology*. New York, NY: Routledge.

O'Dowd, Robert. (2016). Emerging trends and new directions in telecollaborative learning. *CALICO journal*, *33*(3), 291-310.

---, & Ritter, Markus. (2006). Understanding and working with "failed communication" in telecollaborative exchanges. *CALICO journal*, *23*(3), 623-42.

Socio-cultural perspectives of a Virtual Learning Environment through Schoolbook: The De La Salle University - Dasmarinas, Cavite, Philippine experience

Luis Carmelo Buenaventura, PhD

How do families keep track of their sons and daughters academic performance including attendance records accurately in a Virtual Learning Environment? Furthermore, how do the students know their class standings and grades for the Prelims, Midterms, and Finals immediately without meeting the teacher on a face-to-face basis? Since the full scale implementation of the Schoolbook by De La Salle University - Dasmarinas, Cavite, Philippines last 2010, the college faculty were initially encouraged by the school administrators to utilize the e-learning portal on a full-time basis to enhance their teaching insofar as it saved time and resources; not to mention, paper. At the beginning, the faculty who were not tech savvy viewed Schoolbook as a remake or extension of Facebook. However, upon close scrutiny with proper training and orientation by the people of the Center for Innovative Learning Programs (CILP) of the aforementioned institution, many other faculty members coming from different departments were enlightened to realize that Schoolbook, indeed, had a lot to offer in terms of academic achievements, enhancement, and research. This paper features a brief history of utilizing and applying Schoolbook in the De La Salle University Dasmarinas, Cavite setting. Essentially, it includes the advantages and disadvantages of the portal in teaching, learning, and research among college faculty, students, and their parents as well. Future prospects of applying the Schoolbook portal in other aspects of social and cultural communication will also be discussed.

OVERVIEW OF THE ACADEMIC YEAR AT DE LA SALLE UNIVERSITY DASMARIÑAS, CAVITE, PHILIPPINES: A Reality Check

The Philippine academic year begins in August and lasts until December for the first semester while the second semester begins in January and lasts until the end of May the following year. The summer term begins in June and lasts until the middle of July. In this regard, the first semester has a total of 17 weeks academic time or 107 class days while the second semester comprises a total of 16 weeks or 104 class days. The second semester is relatively shorter because of the Christmas break, which begins in the middle of December and lasts until the second week of January of the New Year. Additionally, the second semester is affected by the Lenten Observance of the Holy Week, which has become a religious tradition of the Filipinos to commemorate the Passion, Death, and Resurrection of the Lord Jesus Christ. The summer term, in turn, covers a total of 4-5 weeks or 30 class days with 2-hour periods per class where students are met everyday for a total of two hours each subject. Full-time faculties are assigned a maximum total of 6 units or four class hours daily from Monday to Friday during the summer term. On a regular semester basis, full-time faculty are usually given a total teaching load of 18 units or six subjects of 3 units each with a provision for an overload of 3 units or 1 subject when the need arises. Usually during the first semester, most class activities are confined to the classroom mainly because of heavy rains and floods. July to November is commonly known as the peak rainy season months when heavy rains, floods, and typhoons abound over the entire archipelago. Early December until May are considered the wet to dry-season months where alternative outdoor classroom activities may be organized. The summer term, however, serves as the most conducive period to hold outdoor activities or off-classroom activities like field trips, insofar as the students have relatively more free time to undertake which is a great to acquire more knowledge from the subjects concerned in a practical way.

The Pitfalls of the Lecture Method: A Reexamination of the teacher's conscience.

The problem with many classes today on the university/collegiate level is that teaching for most university lecturers and professors mainly involves standing in front of a lecture hall while reading off notes, based on textbooks and scholarly journals, while students have truly no desire to read at all. If students opt to read the books and required readings insofar as they may have been threatened with a surprise quiz or graded recitation by the teachers concerned, the college

students may obtain little useful knowledge and comprehension out of them since the language utilized by the authors of such readings is so technical and too high for them to comprehend. Let's face it. Most university professors and lecturers alike consider this method as the easiest to execute and get by with. In fact, it is so easy a method since it provides us with the opportunity to easily kill time and conduct a monologue without even caring if our students are listening to us or not at the end of each period. This is the gray area where the important and active, highly participative and dynamic role of the university professor and/or lecturer employing creative and innovative methods and strategies are supposed to come into play so that the lessons become more comprehensible, significant, relevant and highly meaningful to all students absorbing them.

Through many years of teaching experiences, practical wisdom about varied and creative/alternative techniques of "lecturing" have been produced. University professors and lecturers aiming to be effective lecturers are currently required to be *scholars, writers, producers, comedians, entertainers, and animators* most of the time to catch the attention of the students. Essentially, creativity and innovation of teaching and learning methods do not stop nor remain static even after a so-called, "successful and fulfilling semester" insofar as this current generation, the Generation Text, Generation Me, Generation Digital is concerned, where their attention span is relatively short and easily distracted in the usual classroom setting. An admission of fact indicates that very few college professors combine such talents in optimal ways and that even the best that constantly hope and wish to do their best in class are not always in top form. After an entire semester of providing the students with the aforementioned learning tools, the greatest assumption the professors and lecturers predict is that the students have truly grasped the subject and hopefully found some significant meaning in their lives and reorganization of their values as well (McKeachie, 1999:66).

To a large extent, purely lecture-based class sessions throughout an entire semester are judged as "dry", "boring" and "monotonous" since retention of information would be minimal in nature (MacKenzie, Eraut, and Jones, 1976: 38).

This is where alternative teaching and learning strategies through Schoolbook like group interaction games similar to Kahoot and mini-group discussions enters the picture as it is believed to play a significant role in the retention of information and lessons learned from the subjects concerned. Well-planned and carefully organized teaching strategies offer different challenges including windows of teaching and learning opportunities for both teacher and student since such are believed to make a great impact on their lives and values formation. Moreover,

these alternative strategies gradually transform both the teacher and students into highly active mentors, learners, and leaders insofar as relatively new information and knowledge is generated and acquired far beyond what have been written in books, journals, including magazine-based feature articles.

THEORETICAL FOUNDATIONS

This paper put two existing theories in digital education to an initial, exploratory test, namely, The Sociology of Digital Technology and Education by Selwyn, N and Facer, K. (2014) for anticipating the culture of resistance to technology for education and Flow Theory by Mihály Csíkszentmihályi (1996) for teaching and learning of teachers and students.

Digital Technology and Education.

Digital technology in the form of digital devices such as tablets, laptops, and smartphones has been part of contemporary education in ways that would have been hard to imagine even a few years ago. The technology currently supports a diversity of informal learning practices at home, at work and on the move. Classrooms and other formal learning environments are saturated with computer hardware and software where a growing amount of educational work is conducted on a 'virtual' basis. Despite the diversity and complexity of technologies in use, 'the digital' is now an expected but largely unremarkable feature of the educational landscape. Indeed, digital technologies are such an integral component of everyday education that 'the digital' should not just be limited to those researchers who have a particular interest in technology, media and 'ICT' but should include a broad concern for all education researchers, regardless of specialization or background. In addition, it could be argued that there are growing opportunities for sociologists of education to explore ways of engaging in the active construction of educational practices and institutions that reflect, challenge and build upon the wider socio-technical changes of today. So what lies ahead given the 'present' state of the sociology of education and technology? As the decade of the 2010s progresses into the next, there are encouraging signs of a large gamut of work in the field of Sociology. Analyses of digital education are beginning to feature more frequently within the pages of specialist journals such as the British Journal of the Sociology of Education and Sociology of Education. Conversely, 'new media' scholarship (as shown in

journals such as Information Communication & Society and New Media & Society) is increasingly turning its attention towards educational topics and issues. It is not surprising to encounter doctoral studies being pursued (and doctorates awarded) in sociological aspects of education and technology, with specialized programs in subjects such as 'Education, Technology & Society' also thriving at undergraduate and postgraduate levels. In addition, mainstream educational technology journals are beginning to feature work that draws directly from the likes of Foucault (Hope 2013), Bourdieu (Johnson 2009), Bernstein (Player-Koro 2013), Goffman (Davies 2012), Actor Network theory (Wright and Parchoma 2011) and even Marxist perspectives (Hall 2011).

If these trends continue, then we could well be on the verge of seeing the sociology of education take the decisive 'digital turn'. Viewed in this context, a number of key issues and debates relating to 'the digital' continues to develop within the mainstream sociology of education: Digital technology and the reconfiguration of space, time, and responsibility. Indeed, the negation of boundaries lies at the heart of the ideological promises of digital education. Sociologists have therefore moved on from initial concerns over 'time-space compression' and a 'death of distance' to explore the implications of these changes. In particular, the provision of digital education on an expanded and accelerated 'any time, any place, any pace' basis raises a host of questions relating to educational engagement and educational governance – not least the redistribution of responsibilities across different sites and actors (Webster 2013). Indeed, digital technology is clearly associated with a redistribution of work that has to be done in delivering educational opportunities, as well as a potential redistribution of responsibility for educational outcomes that result. In all cases, digital technologies are seen to be enabling educational engagement regardless of place, space, or setting.

Nonetheless, some researchers expressed concerns that these technologies might simply exacerbate forms of individual exploitation. For example, the erosion of previously clear distinctions between formal and informal learning has raised issues over the exploitation of individuals who feel increasingly compelled to engage with education regardless of appropriateness or potential detriment to other areas of life including securing one's privacy and identity online. Digital technologies can be seen to support this compulsion in a number of different ways (Bulfin and Koutsogiannis 2012). For instance, school students may find the family becoming reframed or redefined as a site of increased engagement of schoolwork while outside of school – further increasing what Beck-Gernshiem (1998) describes as the 'pressure' placed upon the contemporary family to

educate. Similarly, adults and children alike may find digital technologies further eliding the social relations of learning and consumption, thus reducing the available time for what Andre Gorz (2001) refers to as a 'time for living'.

Flow Theory by Mihály Csíkszentmihályi (1996)

Flow represents one of eight mental states that can happen during the learning process. In addition to flow, these mental states include anxiety, apathy, arousal, boredom, control, relaxation, and worry; they result when a learner experiences a combination of skill and challenge levels of a task in non-optimal combinations.

Flow is the most optimal of these states for learning, as it is where skill level and challenge level of a task are at their highest. This creates an opportunity for learning and intense focus, where learners can even feel that they lose track of time because they become so immersed in the task, perhaps with a lot of thrill and excitement combined.

In contrast, a learner can experience relaxation in learning a task when their skill level is very high and the task challenge is very low. Conversely, a learner can experience anxiety when their skill level is very low and the task challenge is very high. Neither state is supportive of optimal learning. Note that flow can be experienced in any task involving any field of activity, from music to writing to painting to sports.

Essentially, educational researchers try to understand flow in order to help their students optimize their learning.

RESEARCH DESIGN AND METHODOLOGY

Data gathering for this paper employed the qualitative research design. Primary informal interviews through storytelling were conducted with the implementors and pioneers of Schoolbook who are currently assigned to the Center of Innovative Learning Programs (CILP). Informal interviews through narratives were also conducted with teachers from different departments of the total seven colleges of De La Salle University - Dasmarinas, Cavite who were perceived to actively use Schoolbook in their classes. College students under the care and supervision of this researcher over the past two school years (2015 - 2016 and 2016 - 2017) were informally interviewed through storytelling shortly before the end of each semester. The questions asked for both parties –teachers and students - were summarized into two categories: The Advantages or Benefits of Schoolbook and

the Disadvantages or Pitfalls of Schoolbook. The respondents were requested to freely share their thoughts and opinions about their teaching and learning experiences with Schoolbook during a one-hour period. Insofar as the parents were originally included in this study, at the time of this writing, only 62 parents were registered as parental accounts in Schoolbook; no parent was, however, available for comment and interview because most of them were based abroad and busy earning for the tuition of their children. Some students whose parents closely monitor their sons or daughters academic progress via the Grade book of Schoolbook shared a limited view, which the study used for analyzing the parent's point of view. Since the paper has limited space, the best responses from both teachers and students, which could highlight the majority of respondents, were lumped into one to two responses per category. In other words, one to two teachers or students responses could already represent at least ten to twenty respondents' comments and opinions as regards advantages and disadvantages of Schoolbook.

ENTER SCHOOLBOOK: THE E-LEARNING PORTAL OF DE LA SALLE UNIVERSITY – DASMARINAS, CAVITE

A. Humble Beginnings

Since 2010, Ms. Arlene Roa Awayan, a full-time faculty member of the Marketing Department of the College of Business Administration and Accountancy (CBAA) decided to embark on a project which simplifies the effective delivery of teaching materials to both faculty and students initially of the departments – Marketing and Management. In due time, Ms. Awayan was able to recruit a colleague by the name of Ms. Jennifer Padernal of the Business Management Department to join her with the same project. In this regard, both personalities began to orient themselves with Schoolbook, which was introduced by a private Information Technology company devoted to Education known as NEO LMS PHILIPPINES based in Makati City, Metro Manila. Since the trend at that time was to incorporate e learning in the university curriculum, some faculty members from other colleges and departments gradually expressed interest to incorporate the e-learning structure in delivering their lessons promptly and effectively. In this regard, the concept was presented to the university administrators for strategic planning and review.

The years 2010 to 2012 saw Schoolbook with mixed reactions from the academic community. Some were open-minded while others were not. Those who were labeled anti-technology believed that it was just a waste of time and financial resources since educational materials may be shared to the students via Powerpoint presentations and that the grades may be encoded and later on shared with the students themselves using MS-Excel. Moreover, some faculty even believed that Schoolbook might have simply been an extension of the existing popular social media site – Facebook. For the broad-minded individuals, they were simply going to give everything a try. Such comments and criticisms did not, however, stop the two personalities, Awayan and Padernal from pursuing their goals and spearheading a project for the academic community. In fact, they did not even have an office, which they could truly call a Learning Center committed to Educational Technology. Both persisted and moved on and by 2013, the academic community gradually began to take a closer look at the benefits of Schoolbook.

By that time, the Educational Technology Center (ETC) of De La Salle University - Dasmarinas, Cavite evolved which later on became the Center for Innovative Learning Programs (CILP). Both personalities – Awayan and Padernal – took the initiative then to commence and continue training with Schoolbook, which would eventually be adopted by the academic community to simplify tasks, upload resources, conduct online activities, and submit grades more efficiently than ever before. Subsequently, the organization grew and recruited more faculty members and staff into the CILP. Today, the office conducts Levels 1 to 3 trainings for all interested faculty members. A recent order from the administrators then compelled all faculty members to utilize the electronic grade sheet provided by Schoolbook – the Gradebook – so that both parents and students could instantly monitor their class standings from the beginning towards the end of the semester (Ruben, 2017).

B. What is Schoolbook?

Schoolbook is the institution's E-Learning Portal introduced by NEO LMS PHILIPPINES, which introduces the Virtual Learning Environment or VLE for the entire academic community. In this Virtual Learning Environment, Schoolbook enriches learning experiences by strengthening teacher-student including student-student exchanges and relationships beyond the classroom. Through Schoolbook, the University intends to build and nurture an online community of lifelong learners. The portal apparently offers two types of online learning –

Self-paced and Blended.

Self-paced implies that the teachers simply upload all their lessons, usually in PowerPoint format, for their students' reference and comprehension. In this mode, the lecture method is mainly used because the uploaded lessons are merely repeated in the classroom. For Self-Paced mode, both teachers and students conduct minimal work online since the students are left to themselves to learn and study the uploaded lessons on their own. Blended Learning, for its part, offers two types of course delivery modes: Web-presence and Web-enhanced. For the first mode, Web-presence, is a course delivery mode where the class is largely conducted using face-to-face sessions. The E-class enables teachers and students to utilize the portal as a communication and resource-sharing tool through the use of announcements, news features, messages, educational links and submission of assignments. Web-enhanced, on the other hand, is a course delivery type conducted on a blended mode where both teachers and students meet fifty-percent online and another fifty-percent in the classroom. The faculty meets the students inside the classroom once a week and prepares weekly online learning activities. Most outputs like quizzes and individual/group discussions are administered online as students are immediately graded for their submitted works. The teachers intending to conduct blended classes for the entire semester are initially required to undertake and complete level 3 training provided by the Center for Innovative Learning Programs (CILP). Only those faculty members who have been certified will be allowed to conduct web-enhanced courses. The course calendar must contain the following: Online Learning Activities for each topic and specific schedule of online and face-to-face sessions. The required document is attached to the course syllabus where they have to be approved by their respective chairs and college deans each semester. In turn, the Center for Innovative Learning Programs (CILP) must be provided with a copy of each college faculty's Schoolbook Course Calendar for proper monitoring (Padernal, 2016)

C. Advantages of Schoolbook from the Teacher's and Student's Perspective

Admittedly, some teachers were initially resistant in using the educational portal but after moments of exposure especially with their colleagues in their respective departments using Schoolbook, many of them became enlightened and engrossed in uploading lessons and assessments. Note that their responses support the Flow Theory of Mihály Csíkszentmihályi, one expert in the Psychology of Learning.

A Business Management teacher discloses:

"At first, I thought using Schoolbook was hard and complicated, but after being taught how to use the portal effectively, I realized that it was just so easy and that my students could understand the lessons well. Many times I become engrossed and excited in using Schoolbook. In the past, I was compelled to repeat the lessons in class after lecturing, but now with Schoolbook, it is not necessary to repeat because "lecture time" is now spent with the students asking questions for clarification. Now, I am not worried if my students will pass or fail their major exams. Thanks to Schoolbook, everything has been simplified and made easy for teacher and students to learn effectively."

A History Teacher explains:

"Schoolbook at the beginning was tedious and rather taxing for me because I had to upload all my lessons and assessments. But after going through Module 3 Training, I realized that the lessons including assessments previously uploaded could be reused in the following semesters. Now I can do a lot of multi-taskings since I am able to work from home. The Schoolbook operations make it a breeze for me because I can easily check the submitted works of my students. So I can spend half of the time in school and half of the time with my family at home without sacrificing quality time for my students needs. And guess what? I can even do my laundry! My time in school and the home is maximized as well!"

From the student's perspective, since he is a Management Accounting major and has a lot of paperwork to accomplish in his major subjects, he welcomes the use of Schoolbook especially in completing requirements for his other General Education courses like Sociology:

"At the beginning, I thought that Schoolbook was an extension of Facebook where you could meet new people on campus and chat with your classmates…. but when our subject teacher required us to use it for his subject, I realized that everything became simpler and more efficient. I became so engrossed in working on the assignments that many times, I lost track of time. Practically most of our short and long quizzes including assignments like group discussions could be submitted online and immediately graded. My parents are likewise happy to view my academic progress immediately since they could see my grades instantly. With subjects needing improvement, I am encouraged to work harder and comply with the standard since I would immediately know if I am doing well or not in that subject using Schoolbook."

D. Disadvantages of using Schoolbook

Supporting the tenets of Selwyn and Facer (2014) as regards changes in work etic and taskings including family relationships among parents and students utilizing educational technology, the following accounts have been shared by some faculty members and students.

For one who is not so technologically knowledgeable, Schoolbook for this teacher delays his delivery of the lessons including the submission of grades for his students. A General Education teacher discloses:

"I'm not so Tech Savvy with laptops and desktops! Moreover, I am only using Powerpoint to deliver my lessons and I believe that is enough. To upload my lessons in Schoolbook makes it more complicated and slower for me. And to encode the grades in Gradebook makes it more challenging for me. In fact, I'm not so good yet in using Powerpoint to make my lessons more interesting, so to speak. I still continue to utilize the lecture method and write my lessons on the whiteboard using a whiteboard marker. Nonetheless, I will have to learn how to use Schoolbook but it will definitely take time."

Another General Education teacher shares the same view and adds that Schoolbook may be distracting to both teacher and student while the lessons are delivered and explained:

"Schoolbook does not guarantee that the lessons will be delivered effectively. Many times I have observed my students to be lazy and not listening to my explanation since they are confident that the lessons will be uploaded in the portal anyway. In this regard, to catch their attention, I resort to the traditional method of lecturing. Schoolbook for my subject will only be used to encode their grades for the Prelims, Midterms, and Finals so they will know how they stand in my class."

And for a Sophomore Engineering student who has been familiar with Schoolbook, shares this observation:

"I'm so relaxed using Schoolbook because I can take my time doing my assignments and answering my online quizzes. Sometimes, so relaxed, I suddenly realized it is very close to the deadline that I hardly have time to complete. I also realized that my laziness pays off because of this Schoolbook thinking our teacher could extend the deadline, but to no avail. Now my parents get mad at me because they can instantly see from the Gradebook if I am doing well in all subjects or not. Before I could lie to them and assure them that all is well with me. I am

passing in all subjects, so they think. But not anymore because I can easily get caught lying to my parents about my real academic standing!"

CONCLUSIONS

From the insights shared by the aforementioned respondents, the following conclusions may be gleaned:

1. Despite a relatively strong cultural resistance towards utilizing Schoolbook, the educational portal is here to stay and remain in the university for at least 10 years or more largely shifting and changing teaching, learning, and work styles.

2. Even if there are negative reactions towards using Schoolbook at this moment in time by some faculty and students, this researcher believes that Schoolbook will continue to flourish since the benefits and positive effects largely outweigh the negative reactions towards its use in the community.

3. Somehow those individuals who were initially resistant, will learn to see the usefulness and efficiency of the portal in its implementation. It will just be a matter of, say, two more years from the time of this writing, where more people will be using Schoolbook in their everyday lives.

4. There may be a change of teaching, learning, and working styles especially in the next five years which may prove to be beneficial to De La Salle University Dasmarinas – Cavite's ecology. Imagine the multiplier effect wherein faculty and students will only spend half of their time on campus and half of their time at home completing academic requirements? Won't Schoolbook be one of the concrete measures to save the environment because less fossil fuels have been burned or consumed for a week?

5. The mission to continue the use of Schoolbook should have a sense of political will and support not only from people assigned to the Center for Innovative Learning Programs (CILP) but from the central administrators who should remain open minded as well. All members of the academic community should realize that Schoolbook is but one online educational tool that provides current teachers and students with the vision and structure of a classroom of the future.

REFERENCES

Beck-Gernsheim, E. (1998) “On the way to a post-familial family” Theory Culture and Society, 15, 3- 4, pp.53-70

Bulfin, S. and Koutsogiannis, D. (2012) “New literacies as multiply placed practices: expanding perspectives on young people’s literacies across home and school” Language and Education 26, 4, pp. 331-346.

Csíkszentmihályi, Mihály (1996) Flow: The Psychology of Optimal Experience. New York: Harper Perennial. Pp. 1-163

Davies, J. (2012) “Facework on Facebook as a new literacy practice” Computers & Education 59, 19- 29

Gorz, A. (2001) ‘Critique of economic reason”in Munck, R. and Waterman, P. (eds) Labour worldwide Basingstoke, Macmillan

Hall, R. (2011) “Revealing the transformatory moment of learning technology: The place of critical social theory” ALT-J: Research in Learning Technology, 19, 3, pp. 273-284

Hope, A. (2013) Foucault, Panopticism and School Surveillance Research. In M. Murphy (Ed.) Social Theory and Educational Research. London: Routledge. pp 35-51

Johnson, N. (2009) “Teenage technological experts views of schooling” Australian Educational Researcher 36, 1, 59-72

McKeachie, W. (1999). Teaching Tips: Strategies, Research, and Theory for College and University Teachers. New York. Houghton Mifflin Company.

MacKenzie, N. et. al. (1976). Teaching and Learning: An Introduction to New Methods and Resources in Higher Education._Paris. The Unesco Press and the International Association of Universities.

Player-Koro, C. (2013) “Hype, hope and ICT in teacher education: a Bernsteinian perspective” Learning, Media and Technology, 38, 1, pp. 26-40

Selwyn, N., & Facer, K. (2014). The sociology of education and digital technology: Past, Present and Future. Oxford Review of Education, 40(4), 482-496.

Webster, A. (2013) “Digital technology and sociological windows” in Prior, N. and Kate Orton-Johnson, K. (eds) ‘Digital sociology’ Basingstoke, Palgrave (pp.227-233)

Wright, S. and Parchoma, G. (2011) “Technologies for learning? An actor-network theory critique of affordances in research on mobile learning” in Research in Learning Technology 19, 3, pp.247–258

PERSONAL COMMUNICATION:

Jen Padernal – Proponent and pioneer of Schoolbook – Schoolyear 2016-2017

Roland Ruben – Current Director of the Center for Innovative Learning Programs (CILP) of De La Salle University - Dasmarinas, Cavite. Schoolyear 2016-2017

Infrastructure Readiness and Human Resources in the Implementation of E-learning

Albertus Dwiyoga Widiantoro

ABSTRACT

E-learning is delivered digitally, internet-based network, which is expected to be done online, realtime, and also remotely. The Government of Indonesia has opened the opportunity for universities to implement E-learning with certain criteria aimed at improving the quality and relevance of higher education and industry innovation. Terms of Distance Education Program organizer is an A accredited study program. with accreditation A study program can organize distance education courses in Indonesia and internationally. This paper will present whether the accredited A University is ready and capable in infrastructure to implement E-learning.

Keywords: *E-learning, E-learning Infrastructure, Digitally, Internet Network, Accredited University*

INTRODUCTION

e-learning is a learning process that uses information technology. Information Technology in this case is computer (in the form of software and hardware) and internet. Where the learning process combines classroom learning and online-based, as well as total-based online learning. the use of e-learning in learning is a trend of learning model because with online learning, more and more people who follow it.

The development of information technology such as social media, blogs, videos, podcasts, vlogs, and wikis is currently growing very fast, used easily, and widely used for communication to support the learning process.

The Indonesian government is also utilizing internet technology for e-learning that is used for distance education. Distance education is a process of teaching and learning that is done remotely using various communication media with the aim of providing high education services to the community who can not follow the education face to face or regular and expand access to facilitate the service of higher education in education and learning.

In building e-learning it takes something that is software, hardware, internet network, human resources, and policy. These five components should be a priority if you want e-learning to run well. The selection of good infrastructure is how the needs of the five components are available with enough, then e-learning services to be optimal.

In this research will discuss whether the university who get accreditation A in Central Java can carry out e-learning education well, so it can help the government in distance education by looking at the readiness of its own infrastructure.

LITERATURE REVIEW

E-learning is a learning process that uses information technology (Chox, 2012). The use of technology to complement traditional teaching practices so that e-learning is done without location and time constraints (Richardson, 2003).

E-learning is a process of learning that is delivered digitally, internet-based. In terms of time, E-learning can be done in realtime and online and also remotely. In the classroom settings supported by e-learning can be done flexibly because ICT-based learning can be done individually, independently, based on the community (Markus, 2008).

According to Law no. 12/2012, Distance education is a process of teaching and learning that is done in a distant way using various communication media with the aim of providing higher education services to community groups who can not attend regular or regular education and expand access and facilitate higher education services in education and Learning (Law, 2012). Strengthened by education and cultural minister's regulation that distance education is a process of teaching and learning that is done remotely through the use of various communication media (Government Regulation, 2013)

Indonesia has opened up opportunities for universities to conduct distance education with certain criteria aimed at improving the quality and relevance of higher education and industry innovation; improve access to higher education; increase the GER of higher education (Gross Participation Rate: The proportion of school children at a certain level in the age group corresponding to that level of education); Equitable distribution of affordable and flexible education of space and time.

In the Distance Education program, the availability of Information and Communication technology of the organizers as well as in the Distance Learning Resource Unit (USBJJ) and its connectivity is very important and irreplaceable. If the organizing college does not have adequate information and communication technology tools on campus, then distance education programs can not be implemented. The provision of information and communication technology devices for students may be done through cooperation (with contract documents binding both parties during the course of learning) with partner institutions, such as local universities, or computer courses, etc (RISTEKDIKTI, 2016).

Terms of the implementation of distance education program is a study program that get accredited A can organize distance education courses in Indonesia and internationally. accredited B study programs are only allowed in 3 provinces in the territory of Indonesia [RISTEKDIKTI, 2016]. Principles of ICT utilization in learning as follows:

Table 1. Principles of ICT utilization in learning

Principle	Description	Type
0%	Full face-to-face, learning with print or oral material	Traditional face to face
1%-29%	Using internet technology to facilitate face-to-face patterns, perhaps using an LMS or website to post teaching materials and tasks	Web-enhanced Learning is enriched with internet access
30%-70%	Combines online and face-to-face ways. There is a proportion of online teaching materials delivered. Usually comes with online discussions, and there is a reduction of face-to-face frequency	Blended/hybrid e-learning
>80%	Most or all of the teaching materials are delivered online, without a portion of face-to-face	Fully online elearning

The development of learning now also appears mobile learning which is a join of mobile technology and e-Learning. The mobile aspect in learning makes it different from other learning, especially designing the learning experience by utilizing the 'mobility' service. M-Learning focuses on the mobility of learners, interacting with portable technology.

Information Technology is a computer (in the form of software and hardware) and internet. Where the learning process can combine learning in the classroom and online-based, as well as online-based total. E-learning is a trend of current learning models and the great attention of learning using this model.

The development of information technology in learning is very fast and easy to use. Technologies such as social media, blogs, videos, podcasts, vlogs, and wikis are widely used for communication to support the learning process. This technology can also be integrated with existing e-learning system to form an integrated system.

E-learning can be built at their own expense, rented, can also use cloud technology. By developing their own procurement of hardware, software, experts, network, space then the financing should be borne alone. While the rental system is enough to rent with a certain capacity to the vendor. If the University uses an e-learning system using technology coud the cost of building, maintaining, borne by the vendor. With this model IT staff to keep the server maintained 24 hours by vendors. Cloud technology for e-learning can reduce the

budget needs of hardware, electricity and server space. The linkage between physical infrastructure affects lecturer performance. The availability of complete equipment makes scientists proud of the university and performs well[11].

The e-learning system must keep abreast of technological developments and the demands of society, to develop e-learning using the concept of cloud computing can be easily implemented. But cost and risk management affect how e-learning management solutions are based on cloud computing[12].

Limited availability source of funding of Private University to support technology transfer activities is a major obstacle to the commercialization of university technology effectively. In Indonesia has the same problem that funding at private universities is still very dependent on the growth of students.

The e-learning infrastructure consists of hardware, software, and human resources. Hardware consists of server type, database, user, bandwidth, memory (RAM), and operating system. Software in this case is a tool used for e-leraning of Learning Management System software. Resources are experts who can prepare, install and run hardware, software[14].

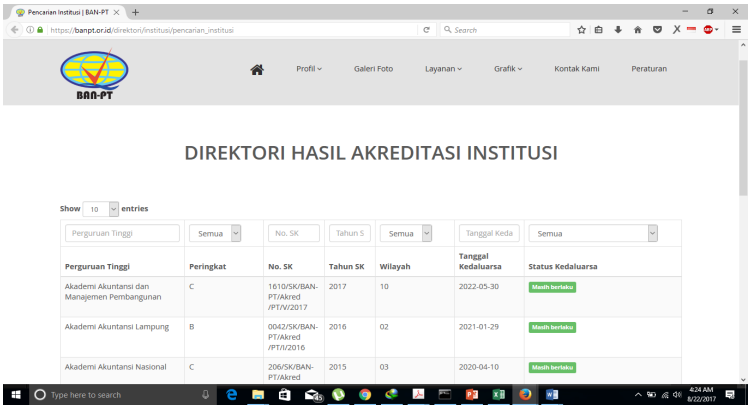
RESEARCH METHODOLOGY

In this study using several stages as follows:

1. Looking for A accredited college: In this search we use data of National Accreditation Board of Higher Education
2. Choosing a college located in Central Java: Look for all websites owned by accredited A college to explore information about e-learning that is owned and implemented.
3. Explore information on infrastructure owned by universities: This process looks for information on what infrastructure is owned and utilized for e-learning services. Infrastructure being excavated is network, server, internet service.
4. Analysis: After searching for all e-learning services the process then analyzes whether the service is appropriate for e-lending required by the government.
5. Conclusions: Conclude e-learning services owned by the needs and demands of e-learning implementation.

RESULTS AND DISCUSION

The process of choosing a college with accreditation A by doing a search on the website authorized to issue a predicate of accreditation of the Institute of National Accreditation Board of Higher Education (BAN PT) with the address https://banpt.or.id, as shown in the picture below.



By using the website of BANPT, 3 private universities in Central Java have accreditation of rank A institution which is the best or highest rank in Indonesia.

Research by way of searching based on college owned websites, whether there is a website that manages about e-learning. By doing an analysis of the existing in the three universities found that the implementation of e-learning is strongly supported by leaders of universities in line with the government. Utilization of e-learning technology is mature enough has started more than 4 years. But not all study programs use e-learning optimally, only limited to uploading lecture material and syllabus. Optimizing the utilization of e-learning for distance education is only one college that has implemented distance education.

University	Staf IT	Support leaders university	Unit development	start years	Users	Distance learning
X1	Less	supported	University Library	>4	anny department	No
X2	enaugh	supported	Centre Technical implementation unit	>8	Anny department	No
X3	enaugh	supported	Centre Technical implementation unit	>5	Anny department	Yes

infrastructure development is done by gradually is the procurement of servers, internal network, and bandwidth because it requires high cost. With the increase of study programs that use e-learning then the process needs and server speed increases. The addition of bandwidth is influenced by several factors: the number of users increases, the larger the multimedia size the larger, the laptop and mobile devices the higher the speed, also the need to access data abroad. The need for data IX (international exchange) is higher due to the many materials available. The addition of the network is done due to the increase of computer laboratory, the installation of network in the classroom, increasing the wifi point open room.

The internet service for e-learning of the three high-performers has used a 1: 1 dedicated leaseline comparison where local Indonesian data access and international data get a 1: 1 comparison. Implementation of e-learning is greatly assisted by the cooperation between ISPs using the Open IXP model, using this model of communication between ISPs is very fast and not paid because of the ISP that is included in the IDC (Indonesia Data Center), so that e-learning access speed can be increased.

the development of infrastructure done at the time of addition of data, the amount of data is getting bigger, and the higher speed is done by adding device or replacing with bigger capacity. Cloud technology offered by many ISPs is not attractive because prices are still considered expensive, concern for data security, ISP providers can do anything to the data without the owner's intact.

Bandwidth management is done by dividing some parts of Server, Wifi, and cable network. However, these three universities have different architectures that divide each building and some divide bandwidth centrally. Wifi networks are mostly used for student and guest services, while wired networks are used for academic and teaching staff. The number of students accessing greatly affects the speed of access to the server. The process of calculating bandwidth is as follows:

BandWidth per student = (total bandwidth - Bandwidth for server-network cable) / number of students;

By comparing with the number of students then the need for internet access is still less than 1Kbps / student. This data shows that if all students use e-learning technology then that can be accessed is lecture material. The internet network has not been able to access multimedia such as movies, video calls, video conferencing. So that is done by doing a conference in class by scheduling.

Opensource technology is still the main choice, where the operating system and learning management system (LMS). Selection of operating system based on opensouce because it is considered safe, stable, easy to manage, update system quickly. Linux operating system used one type with the aim of not difficulty in transfer of knowledge to IT staff.

Perguruan Tinggi	BW	Server	Cloud	Jenis server	Memory	Hardisk	Jaringan internal	Os	LMS
X1	1.3 gbps	own server	-	Xeon rack	32	SaS	FO backbone	Linux	Moodle
X2	1 gbps	Colocation	-	Xeon rack	16	SaS	FO backbone Cable	Linux	Moodle
X3	850 Kbps	own server	-	Xeon rack	16	SaS	FO Backbone	linux	Moodle

Conclusion

Universities that have accreditation A have all lead to the implementation of e-learning though not fully concerned about Fully online elearning and still implemented partially only some courses are still based on “Web-enhanced” or learning enriched with internet access and Blended / hybrid e -learning.

Fully online elearning offered by the government is still constrained on infrastructure whose development is implemented in stages due to high costs, human resources in the field of IT and lecturers still have to train in the utilization of e-learning is evident from the number of courses offered in e-learning a bit.

Infrastructure development needs to be accelerated to anticipate the number of participants and study programs using e-learning technology, in order to avoid any disillusionment of participants in their use.

New technology-based infrastructure “cloud” has not been a solution in the development of e-learning, because it is still considered high cost.

REFERENCES

[1] Cox MJ. K , “Formal to informal learning with IT: research challenges and issues for e-learning “

[2] Jennifer C. R., Karen Swan. “Examining Social Presence In Online Courses In Relation To Students Perceived Learning And Satisfaction”

[3] Bela Markus “Thiinkiing aboutt e-Learrning”.

[4] UU no. 12/2012 “tentang pendidikan tinggi, pendidikan jarak jauh pasal 31”

[5] Permendikbud No. 109/2013

[6] Panduan Pelaksanaan Pendidikan Jarak Jauh 2016

[7] Kebijakan Pendidikan Jarah Jauh dan e-learning di Indonesia

[8] kebijaksanaan Pendidikan Jarak Jauh dan E-learning di Indonesia Kementrian Riset, Teknologi dan Pendidikan Tinggi 2016

[9] Yousef M. , Hamideh Z., “Mobile Learning for Education: Benefits and Challenges”

[10] Shu-Sheng L., Hsiu-Mei H., Gwo-Dong C. “Surveying instructor and learner attitudes toward e-learning”.

[11] Rozilah K., Musa A. A., Bala I. “Asessment Of Service User’s Experience On The Facilities Provision At Uthm Students’ Residential Colleges”.

[12] Paul P., Felician A., Marius V., “Measuring the Efficiency of Cloud Computing for E-learning Systems”

[13] Federico M., Maurizio S., Laura T., “The university as a venture capitalist? Gap funding instruments for technology transfer”

[14] Abdul R. H, “Infrastructure Requirements for E-learning Implementation and Delivery” http://blog.commlabindia.com/elearning-design/infrastructure-for-elearning

Online Learners' Motivation in Online Learning: The Effect of Online - Participation, Social Presence, and Collaboration

Andree E. Widjaja
Jengchung Victor Chen

ABSTRACT

Online learner's motivation has been considered as one of the most important factors that drives online learning. Drawing from the Self Determination Theory (SDT), this present study incorporated the concept of Intrinsic motivation (Flow Theory) and Extrinsic Motivation (Attention, Relevance, Confidence, and Satisfaction Model, or popularly known as ARCS) to empirically investigate the effect of online learner's motivation towards online learning effectiveness, measured by online learner's grade and their perceived skill development. Meanwhile, derived from the Social Constructivists Theory, the factors such as online participation, social presence, and collaboration were also considered as the factors which could enhance online learners' motivation. Seventy five (75) International Management Business Administration (M.B.A.) students who enrolled in several online learning courses were participating in this study.

The findings of this study strongly indicated that higher online learner's Flow and ARCS could significantly increase online learner's perceived skill development, but not their grade. It was also found that only online participation that could significantly enhance online learners' Flow. Other factors did not show the significant results. Online learner's extrinsic motivation did not show significant increase in any factors. This study provides some valuable insights

on how to improve online learning course design which focuses on online learner's motivation, particularly by considering the factor of online participation as the strongest factor that drives online learner's intrinsic motivation. The discussion and limitations of this study are discussed.

***Keywords**: ARCS model, Collaboration, Flow theory, Intrinsic and Extrinsic Motivation, Online Participation, Social Presence*

INTRODUCTION

Unlike traditional face-to-face classroom, online learning is using Information Communication Technology (ICT) as the only medium to deliver teaching materials, interact, collaborate, and engage with other learners. The online learning alters the face-to-face interaction, reduce social interaction, hence causing the learners to feel isolated (Bolliger, Supnakorn, & Boggs, 2010; Shaw & Polovina, 1999). Such condition would make the learning process more challenging, especially concerning the loss of learners' motivation (Bolliger et al., 2010; Inoue, 2007).

Learners' motivation ranges from intrinsic motivation in which learner is motivated due to the challenges or the fun whenever they are doing the task, to extrinsic motivation in which the learners take action due to external stimuli, rewards, or avoiding pressure or punishment (Deci & Ryan, 1985; Xie & Ke, 2011). In addition, the learners prefer more engaging learning environment which learners and teachers would have direct interaction with other learners, spontaneity, immediate feedback, and relationship (Clayton, Blumberg, & Auld, 2010). The online learning factors such as online participation, social presence, and collaboration could imitate the traditional engaging learning environment to some extent. Among the three aforementioned factors, online participation has been argued as the strongest factor that contributes the most to learning effectiveness in online environment (Hrastinski, 2009).

This study has objective to empirically investigate the learners' motivation towards online learning effectiveness, measured by grades and perceived skill development (PSD). In addition, the effect of online participation, social presence, and collaboration towards learners' motivation were also included,

as to whether these factors could actually enhance learners' motivation. Therefore, the following research questions would be answered: 1). How learners' motivation affects the learning effectiveness, measured by grades and perceived skill development? 2). What are the effects of online participation, social presence, and collaboration towards learners' motivation, both extrinsically and intrinsically?

This study contributes to the learners' motivation theory, particularly in online learning context. The higher the learners' motivation is, the more effective learning that the learners would have. This study empirically validates the importance of learners' motivation in online learning context. Besides, the study contributes in proving the factors which is important to online learning such as online participation, social presence, and collaboration. Few studies were found to empirically validate the importance of these three factors, particularly the role of online participation towards learners' motivation. These factors are crucial for designing proper instructional design that promotes learners' motivation when they indulge in online learning environment.

REVIEW OF LITERATURE AND HYPOTHESES DEVELOPMENT

Learners' Motivation in Online Learning

Researchers emphasize the role of extrinsic motivation to explain user behavior. However, Agarwal (2000) argued that intrinsic motivation also plays a very important role. Motivation construct has been analyzed in multiple ways, mainly the distinction is drawn between intrinsic and extrinsic motivation factors (Gomez, Wu, & Passerini, 2010). The distinction between them is based on Self Determination Theory (SDT) (Fagan, Neill, & Wooldridge, 2008).

Intrinsic Motivation – Flow Theory

Intrinsic motivation is a specific kind of motivation. When a learner is intrinsically motivated, they engage in the tasks for the pleasure that come from that task which may have an effect on their motivation (Song, 1998). Flow theory framework can be used to measure the intrinsic motivation of online learners. Csikszentmihalyi (1990) adopted this intrinsic motivation in a term which is popularly called 'Flow'. Flow theory suggests people are willing to perform activities, not because by external rewards, but because of internal motivations within themselves.

Extrinsic Motivation – ARCS

Keller (1988) argued the people will be motivated to undertake action if it gives them personal satisfaction and if they have chance to be successful. Keller (1983) believed that the motivation refers to the choices that people make as to what experiences or goal they will approach or avoid, and the degree of effort they will exert in that respect. Derived from the assumption that motivation is playing greater role in the learning process, Keller proposed the ARCS model of motivational design, consisting of four elements (Attention, Relevance, Confidence, Satisfaction) for motivating learners (Keller, 1983; Keller & Suzuki, 1988).

Motivation and Learning Effectiveness

Motivation is a driving factor influencing performance (Sankaran & Bui, 2001) and successful learning (Clayton et al., 2010). Many researchers agreed there is positive correlation between motivation and the learning effectiveness. This argument was strongly supported by Sach (2001) who supported that there is a positive relationship between achievement motivation and learners' performance. Several studies in motivation consistently suggested the higher the motivation level, the better learners would perform in various instructional settings (Sankaran & Bui, 2001).

Learners who have high motivation would show high grade performance (Sachs, 2001). Previous studies found motivational orientation of learners have significant impact on their performance (Rau, Gao, & Wu, 2008). Meanwhile, Gomez (2010) study showed the perceived motivation has significant relationship with the learners' perceived learning. Thus, when the learners' motivation is high, it would increase the learning effectiveness. Based on the aforementioned arguments, the following hypotheses are proposed:

H1a: High intrinsic motivation increases students' grade.
H1b: High intrinsic motivation increases students' perceived skill development.
H2a: High extrinsic motivation increases students' grade.
H2b: High extrinsic motivation increases students' perceived skill development.

Online Participation and Motivation

Online participation as theory was initially proposed by Hrastinski (2009) in which he argued that online participation underlies online learning as a the

most powerful variable than any other variables. Hrastinski (2009) articulated his theory by arguing participation and learning is inseparable and jointly constituting so that online participation would become the main key to drive online learning. In this study, online participation is based on social constructivist theory. By definition, "online participation is a process of learning by taking part and maintaining relations with others. It is a complex process comprising doing, communicating, thinking, feeling and belonging, which occurs both online and offline" (Hrastinski, 2009).

Previous studies have shown that intrinsic motivation would significantly impact learners' participation rate in online discussion (Hew & Cheung, 2008; Xie & Ke, 2011). Therefore, it is also logical to reason that when the learners participate, they tend to have higher motivation. On the contrary, lower learners' participation tends to be caused by the lower level of motivation. The online participation would promote the environment in which increasing learners' motivation. The strong attributes existed in online participation as the strongest learning variable is necessary to cultivate rich social learning experience. The intense discussion, participation with abundant interactions among the learners, the feeling, engaging experience, and belonging as well as more connected-relationship as one community, all of them would have great effect in cultivating learners' motivation, both intrinsically and extrinsically. Thus, following hypotheses are proposed:

H3a: Online participation increases learners' intrinsic motivation
H3b: Online participation increases learners' extrinsic motivation

Social Presence and Motivation

Short, Williams, and Christie (1976) were the first to introduce the concept of social presence in the field of social psychology and communication. In their study, they defined social presence as the "degree of salience" of the other person in the interaction and the consequent salience of the interpersonal relationship" (Short et al., 1976). Social presence in electronic and paper based media is considered low, while face to face communications is high (Dennis, Kinney, & Hung, 1999).

Social presence could affect learners' motivation since it can enhance degree of realness in the online environment. Recall that online learning as social process, the existence of a real person virtually is very crucial, especially to trigger good interaction and collaboration. The learners with high social presence would

not feel isolated and cold since they perceived as real by others in the online environment (Rogers & Lea, 2005). In doing so, high social presence promotes higher learners' motivation to learn by providing the higher degree of realness that supports their learning interaction and process, thus we expect that:

H4a: Social presence increases learners' intrinsic motivation
H4b: Social presence increases learners' extrinsic motivation

Collaboration and Motivation

By doing collaboration, learners can contribute to deeper learning, shared understanding, critical thinking and long-term retention of the learned material (Tsai, 2009). All of this would trigger the learners to have higher motivation to learn. Research has shown collaborative learning could enhance learners' motivation (Chou & Chen, 2008). Learners who perceived high levels of collaborative learning tended to be more satisfied compared with those who perceive low level (So & Brush, 2008). In high collaboration environment, learners feel more engaged, intimate, and satisfied as they collaborate with each other to produce shared artifacts, thereby increasing the learners' motivation. Thus, we expect that:

H5a: Collaboration increases learners' intrinsic motivation.
H5b: Collaboration increases learners' extrinsic motivation.

METHODS

Online Learning Experiment

The experiment was conducted in International Master of Business Administration (IMBA) program in one Public University in southern Taiwan. Courses related with ICT were chosen. The courses were Business Ethics and Information Security (BEIS), Electronic-Commerce (E-Commerce), and Management Information Systems (MIS). The online learning content was about studying Information Ethics, Privacy and Trust.

The three classes were taught by the same professor acted as control in delivering the materials. BEIS and E-Commerce were selected as experimental classes, while MIS served as control class. Learners were not informed about their involvement

in this experiment. Each learner was asked to access online learning management system, Moodle system provided by the University in which various materials and assignments were delivered. In the beginning, learners in each class were given brief training on how to access the Moodle system. Afterwards, they were divided into team which consisted of two to three learners in each team.

The learners were required to access materials and worked on four case study assignments, each of which required to be finished in two weeks period. Learners were required to submit the team papers at the end of assignment. The experimental design followed 2X2X2 factorial design. In this study, treatment was defined as operationalization of construct in terms of what functions or instructional design provided in Moodle as well as activity and instruction given. In experimental group each class was given treatment (high and low) to see whether each treatment had any effect on the learners' motivation. In addition, social presence and collaboration treatment were designed for both experimental groups, whereas the control group was not given any treatment. The experimental groups consisted of 8 treatments where each group was randomly assigned. A more detailed experimental design is shown in table 1 and table 2.

Table 1. Experimental design table

Experimental Design					
Class	Online Participation	Social Presence			
		High		Low	
		Collaboration			
		High	Low	High	Low
BEIS	High	A1	B1	C1	D1
E-Commerce	Low	A2	B2	C2	D2
MIS		Control			

Table 2. Experimental manipulation stimulus

Construct	Stimulus	Description
Social Presence	High	• #Logins (required to sign in 2/week) • Full profile (info picture, description, name) • Introduction in Forum • Chat room • Group name (by themselves)
	Low	• Limited profile • No Introduction • No chat room
Online participation	High	• SCORM embedded with animation, music, video, graphic pictures, articles, etc. • Forum strictly graded for whole class (content quality, how many posts/ replies) • Must use Emotion Icon in forum • Wiki IMBA update (whole class project) – must contribute • Chat function
	Low	• No SCORM • Few video, link to external website • Articles, link to external website • Forum provided but optional • No Wikipedia IMBA
Collaboration	High	• Moodle Wiki (done online)
	Low	• No Wiki (email submit)

ARCS Design

To enhance online learning design as well as promote students' external motivation, the basic concept of ARCS instructional design was applied. Based on the model, ARCS is the abbreviation of Attention, Relevance, Confident, and Satisfaction. This concept was useful to make appropriate design for online learning. The detail is as followed:

- **Attention**

  Materials were based on the real world cases which were relatively

interesting and raised learners' curiosities. Various materials were ranging from text, graphics, and videos delivered over the Moodle. Other functions such as discussion forums and wiki were used to retain learners' attention.

- **Relevance**

  Materials given were relevant to the course and meet the learners' needs for learning.

- **Confidence**

  Instruction as well as grading criteria was clearly defined before each case. Both course materials and assignment were purposely design in structured, clear, and to be easily understood so the learners' confidence could be enhanced.

- **Satisfaction**

  The overall course design and materials equipped the learners to use new way to learn through online learning. For example, various course materials were given as well as intense discussion could provide meaningful opportunities for learners to use their acquired knowledge or skill. In addition, some function such as wiki was used. Thus, it was the new experience for learners to be involved in such engaging online activities.

Measurements

The assessment survey to measure intrinsic motivation was based on virtual-course flow measure (VFM) (Shin, 2006). The major constructs consisted of: concentration (10 items), having a clear goal (1), skill (3), challenge (4), and satisfaction (4). The survey used 7 point Likert-scale and were administered after the online course had finished. Extrinsic motivation questionnaire was based on Instructional Material Motivational Survey (IMMS) derived from Attention, Relevance, Confidence, and Satisfaction motivational design model (Huang, Diefes-Dux, & Imbrie, 2006). There were 20 item used which were claimed to be statistically significant. In this study, the survey used 7 point Likert-scale and were administered after online course had finished.

Grade was used as main prediction of learning effectiveness. The grade was measured from the submitted papers. The grading criteria included: group writing quality such as the correctness of the answers (40%); argumentations

and given solutions (40%); systematic writings as well as paper presentation (20%). The grade was carefully graded by the instructors. The grade's range was from 0 (lowest) – 100 (highest). The perceive learning was measured by Alavi (1994) perceived skill development questionnaire which consisted of eight items. Perceive learning is defined as changes in learner's perceptions of skill and knowledge levels before and after experience in learning. In this study, the surveys used 7 point Likert-scale and were administered each time after the learners' finished the assignment.

RESULTS

Demographic

There were total of 75 learners in 3 classes, BEIS (27), E-Com (30), and MIS (18) participated in this study. Table 3 shows the complete demographic data.

Table 3. Demographic data

Demographic		N	%
Gender	Male	28	37.3
	Female	47	62.7
Nationality	American	3	4.0
	Bolivian	1	1.3
	Canadian	2	2.7
	Gambia	1	1.3
	Hong Kong	1	1.3
	Indonesia	1	1.3
	Korea	1	1.3
	Mongolia	6	8.0
	Polish	2	2.7
	Russia	1	1.3
	Taiwan	46	61.3
	Thailand	7	9.3
	Vietnam	3	4.0

Demographic		N	%
Age group	20-25 Years	19	25.3
	26-30 Years	31	41.3
	31-35 Years	21	28.0
	36-40 Years	2	2.7
	>40 Years	2	2.7
Hours spend computer	<1 hours	1	1.3
	1 – 3 hours	13	17.3
	4 – 6 hours	26	34.7
	>6 hours	35	46.7
Hours spend Internet	<1 hours	4	5.3
	1 – 3 hours	24	32.0
	4 – 6 hours	27	36.0
	>6 hours	20	26.7
Employed by IT company before	Yes	16	21.3
	No	59	78.7
Have IT background	Yes	18	24.0
	No	57	76.0
Computer Skill	Poor	3	4.0
	Mediocre	40	53.3
	Good	20	26.7
	Very Good	9	12.0
	Excellent	3	4.0
English is first language	Yes	8	10.7
	No	67	89.3

Factor Analysis

We followed general factor analysis rule which is factor loading should be higher than 0.7, while Cronbach's alpha should be higher than 0.8. Table 4 shows the factor analysis result.

Table 4. Factor analysis results

Measurement	Variables	Factor Loading	Item Total Correlation	Cronbach's Alpha
ARCS	Moodle Attention			0.96
	MA5	0.92	0.90	
	MA2	0.91	0.88	
	MA4	0.89	0.87	
	MA3	0.88	0.85	
	MA8	0.88	0.85	
	MA10	0.88	0.85	
	MA9	0.87	0.84	
	MA6	0.87	0.84	
	MA1	0.86	0.83	
	MA7	0.82	0.79	
	Moodle Relevance			0.86
	MR1	0.93	0.76	
	MR2	0.93	0.76	
	Moodle Confidence			0.93
	MC2	0.91	0.85	
	MC5	0.89	0.83	
	MC4	0.88	0.81	
	MC1	0.87	0.79	
	MC3	0.86	0.78	
	Moodle Satisfaction	DEL		

FLOW	Enjoyment			0.95
	E1	0.95	0.90	
	E3	0.95	0.90	
	E2	0.95	0.89	
	Telepresence			0.81
	T2	0.91	0.68	
	T1	0.91	0.68	
	Focused Attention			0.82
	FA3	0.85	0.69	
	FA1	0.84	0.67	
	FA4	0.82	0.67	
	FA2	0.69	0.51	
	Engagement			0.86
	EG2	0.88	0.77	
	EG4	0.87	0.75	
	EG3	0.85	0.71	
	EG1	0.75	0.59	
	Time Distortion			0.85
	TD1	0.93	0.75	
	TD2	0.93	0.75	
	Challenge			
	C2	0.94	0.86	0.90
	C1	0.93	0.84	
	C3	0.86	0.71	
Perceived Skill Development (PSD)				0.96
	P1	0.92	0.89	
	P2	0.92	0.89	
	P3	0.92	0.89	
	P6	0.91	0.88	
	P4	0.91	0.88	
	P5	0.88	0.85	
	P7	0.80	0.75	
	P8	0.79	0.73	

Flow and Grade

Table 5 compares the effect of intrinsic motivation (Flow) to learners' grade. Cluster analysis was performed to divide the learners' Flow to two levels, Flow low and Flow high. Afterwards, the Grade was clustered and compared based on their Flow level. The result showed there was a slight increase in learners' grade between Flow low and Flow high. However, the increase was not significant due to low ANOVAs result (F=0.88, P value = .35). As a consequence, hypothesis 1a is not supported.

Table 5. Flow and grade results

Class		Grade in Flow Low	Grade in Flow High	F Value	Significant
Total All Classes	Mean N Stdev	84.82 37 6.12	86.19 38 6.47	0.88	.35

* p < .05

Flow and PSD

Table 6 compares the effect of intrinsic motivation (Flow) to PSD. Cluster analysis was performed to divide the learners' Flow to two levels, Flow low and Flow high. Afterwards, learners' PSD were clustered and compared based on their Flow level. The result showed there was a significant increase in PSD between Flow low and Flow high. ANOVA result show significant number (F=10.74, P value = .00). Hence, hypothesis 1b is supported.

Table 6. Flow and PSD results

Class		PSD in Flow Low	PSD in Flow High	F Value	Significant
Total All Classes	Mean N Stdev	5.03 42 0.90	5.73 33 0.94	10.74*	.00

* p < .05

ARCS and Grade

Table 7 compares the effect of external motivation (ARCS) with Grade. Cluster analysis was performed to divide the learners' ARCS level to two parts, ARCS low and ARCS high. Afterwards, learners' grades were clustered and compared based on their ARCS level. The result showed there was no significant difference between grades in ARCS low and ARCS high (F=0.24, P value=.62). Hence, we reject hypothesis 2a.

Table 7. RCS and grade results

Class		Grade in ARCS Low	Grade in ARCS High	F Value	Significant
Total All Classes	Mean N Stdev	85.93 33 6.89	85.19 42 5.86	0.24	.62

* p < .05

ARCS and PSD

Table 8 compares the effect of extrinsic motivation (ARCS) to PSD. Cluster analysis was performed to divide the learners' ARCS to two levels, ARCS low and ARCS high. Afterwards, learners' PSD were clustered and compared based on their ARCS level. The result showed there was a significant increase in PSD between ARCS low and ARCS high. ANOVA test showed significant result (F=7.78, P value = .00). Based on this result, we strongly support hypothesis 2b.

Table 8. ARCS and PSD results

Class		PSD in ARCS Low	PSD in ARCS High	F Value	Significant
Total All Classes	Mean N Stdev	5.08 43 0.96	5.69 32 0.98	7.78*	.00

* p < .05

Online Participation and Learners' Motivation

The online participation class showed relatively higher extrinsic and intrinsic motivation than low and control class. ANOVA results confirmed there is significant difference (F=7.57, P value = .00) for learners' intrinsic motivation between high and low online participation class. However, the extrinsic motivation showed no significant difference (F=0.49, P value = .48). The result suggests supporting hypothesis 3a and rejecting hypothesis 3b. Table 9 and table 10 show the results.

Table 9. Online participation and motivation descriptive results

Class	Online Participation	ARCS	Flow
BEIS (High)	Mean N Std Dev	4.93 27 1.12	5.45 27 0.84
E-Commerce (Low)	Mean N Std Dev	4.73 30 1.04	4.84 30 0.83
MIS (Control)	Mean N Std Dev	4.44 18 0.85	4.60 18 0.74

Table 10. Online participation and motivation ANOVA results

Online Participation ANOVA Comparison	Dependent Variables	F value	Significance
BEIS (High) Vs E-Commerce (Low)	ARCS	0.49	.48
	Flow	7.57*	.00

Social Presence and Learners' Motivation

There was no significant difference in learners' extrinsic and intrinsic motivation between high and low social presence groups as it is shown by low ANOVA result. Table 11 and 12 describes the descriptive and ANOVA comparison result. Hence, we reject both hypothesis 4a and 4b.

Table 11. Social presence and motivation descriptive results

Class	Social Presence	ARCS	Flow
Total (High)	Mean N Std Dev	4.77 29 1.11	5.21 29 0.78
Total (Low)	Mean N Std Dev	4.88 28 1.05	5.04 28 0.98
MIS (Control)	Mean N Std Dev	4.44 18 0.85	4.60 18 0.74

Table 12. Social presence and motivation ANOVA results

Social Presence ANOVA Comparison	Dependent Variables	F value	Significance
Total (High) Vs Total (Low)	ARCS	0.14	.70
	Flow	0.54	.46

Collaboration and Learners' Motivation

There is no significant difference in learners' extrinsic and intrinsic motivation between high and low collaboration group as it is shown by low ANOVA result. Table 13 and 14 showed the descriptive and ANOVA comparison result. Based on this result, both hypothesis 5a and 5b are rejected.

Table 13. Collaboration and motivation descriptive results

Class	Collaboration	ARCS	Flow
Total (High)	Mean N Std Dev	4.69 28 1.18	5.15 28 0.94
Total (Low)	Mean N Std Dev	4.95 29 0.97	5.10 29 0.83
MIS (Control)	Mean N Std Dev	4.44 18 0.85	4.60 18 0.74

Table 14. Collaboration and motivation ANOVA results

Collaboration ANOVA Comparison	Dependent Variables	F value	Significance
Total (High) Vs Total (Low)	ARCS	0.81	.37
	Flow	0.05	.81

DISCUSSIONS, CONCLUSION, AND SUGGESTIONS

This study empirically investigates the role of both learners' extrinsic and intrinsic motivation to the learning effectiveness, measured by the grades and PSD. Our findings indicate high motivation did not significantly increase the grade. However, higher motivation did significantly increase the learners' PSD. The similar results were also found for both extrinsic and intrinsic motivation. This results would suggest that the higher the learners' motivation, the higher their PSD. This result can be explained by the subjective nature of motivation and learners' PSD. Meanwhile, grade is considered as objective in nature.

Learners with high motivation would mean that they had a spirit, encouragement, and more efforts to learn more than the less motivated learners. This motivation comes from subjective feeling of the learners, either extrinsic or intrinsic. Consequently, when they feel that they learn something, they would have better subjective reflection in their PSD. Learners who have high motivation may report higher and more effective learning outcome in their PSD. Our result is consistent with Gomez (Gomez et al., 2010) study, that there is a positive relationship between learners' perceived motivation to perceived learning. However, our finding suggests that, it may not always consistent with their grade. There were several studies argued the higher motivation should also increase learners' overall performance (Huang et al., 2006; Rau et al., 2008; Sachs, 2001). Ideally, the higher motivation is supposedly, not only increasing their perceived skill development, but also increasing their grade. However, such statement may not always be true.

Rovai and Barnum (2003) argued that grade does not reflect the students' pure learning. In this study, there were at least three profound issues in using grade as learning effectiveness measurement. These issues were, learners heterogeneity, the grade was measured by the group work, and the possibility of instructor biased while grading the assignments. Each learner might have diverse experience of knowledge, abilities, talents, culture, and English abilities (the online course was conducted using English), all of them could affect students' motivation to learn as well as may determine their grade.

One important finding was related to intrinsic motivation (flow). High online participation group experienced significantly higher flow than other groups. However, high online participation did not significantly increase learners' extrinsic motivation (ARCS). Flow as intrinsic motivation has several advantages over extrinsic such as learners more likely to select challenging task, gain more knowledge, promote greater creativity, better conceptual learning, and greater

pleasure as well as active involvement in activities (Cheng & Yeh, 2009; Stipek, 2002). Learners in high online participation group could make advantage of their rich and engaging learning experience, thereby significantly increase their flow. However, such significant increase in learners' flow could not be found in social presence and collaboration.

This study is not without limitation. The number of learners participate in this experiment was considered too small and came from single University. Future study should address this issue by increasing the number of learners, and if possible to collaborate with different universities to generalize the results of this finding. In this study, the grade was measured as a team work. However, we measured individual motivation who works in the team in relation to their final team grade. Future study should consider applying the motivation measures at team level so that the team motivation can be more accurately related with the team grade.

REFERENCE

Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorbtion and beliefs about information technology usage. *MIS Quarterly, 24*(4), 665-694.

Alavi, M. (1994). Computer-mediated collaborative learning: An empirical evaluation. *MIS Quarterly, June*, 159-174.

Bolliger, D. U., Supnakorn, S., & Boggs, C. (2010). Impact of podcasting on student motivation in the online learning environment. *Computers & Education, 55*, 714-722.

Cheng, Y. C., & Yeh, H.-T. (2009). From concepts of motivation to its application in instructional design: Reconsidering motivation from an instructional design perspective. *British Journal of Educational Technology, 40*(4), 597-605.

Chou, P. N., & Chen, H. H. (2008). Engagement in online collaborative learning: a case study using a web 2.0 tool. *Journal of Online Learning and Teaching, 4*(4), 574-582.

Clayton, K., Blumberg, F., & Auld, D. P. (2010). The relationship between motivation, learning strategies and choice of environment whether traditional or including an online component. *British Journal of Educational*

Technology, 41(3), 349-364.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper and Row.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York: Plenum Press.

Dennis, A. R., Kinney, S. T., & Hung, Y. T. C. (1999). Gender differences in the effects of media richness. *Small Group Research, 30*(4), 405-437.

Fagan, M. H., Neill, S., & Wooldridge, B. R. (2008). Exploring the intention to use computers: An empirical investigation of the role of intrinsic motivation, extrinsic motivation, and perceived ease of use. *Journal of Computer Information Systems, 4*(3), 32-37.

Gomez, E. A., Wu, D., & Passerini, K. (2010). Computer-supported team-based learning: The impact of motivation, enjoyment and team contributions on learning outcomes. *Computers & Education, 55*, 378-390.

Hew, K. F., & Cheung, W. S. (2008). Attracting student participation in asynchronous online discussion: a case study of peer faciliation *Computers & Education, 51*(3), 1111-1124.

Hrastinski, S. (2009). A theory of online learning as online participation. *Computers & Education, 52*, 78-82.

Huang, W., Diefes-Dux, H., & Imbrie, P. K. (2006). A preliminary validation of attention, relevance, confidence, satisfaction model-based instructional material motivational survey in a computer based tutorial setting. *British Journal of Educational Technology, 37*(2), 243-259.

Inoue, Y. (2007). Online education for lifelong learning: A silent revolution. In Y. Inoue (Ed.), *Online education for lifelong learning* (pp. 1-28). Hershey, PA: Information Science Publishing

Keller, J. M. (1983). *Motivational design of instruction, instructional design theories and instruction: an overview of their current status*. Hillsdale, NJ: Lawrence Erlbaum.

Keller, J. M., & Suzuki, K. (1988). *Use of the ARCS motivation model in courseware design, instructional design for microcomputer courseware*. Hillsdale: Lawrence Erlbaum.

Rau, P.-L. P., Gao, Q., & Wu, L.-M. (2008). Using mobile communication technology in high school education: Motivation, pressure, and learning performance.

Computers & Education, 50, 1-22.

Rogers, P., & Lea, M. (2005). Social presence in distributed group environments: The role of social identity. *Behavior & Information Technology, 24*(2), 151-158.

Rovai, A. P., & Barnum, K. T. (2003). Online course effectiveness: An analysis of student interactions and perceptions of learning. *Journal of Distance Education, 18*(1), 57-73.

Sachs, J. (2001). A path model for adult learner feedback. *Educational Psychology, 21*, 267-275.

Sankaran, S. R., & Bui, T. (2001). Impact of learning strategies and motivation on performance a study in web-based instruction. *Journal of Instructional Psychology, 28*, 191-198.

Shaw, S., & Polovina, S. (1999). Practical experiences of, and lesson learnt from, internet technologies in higher education. *Educational Technology & Society, 2*(3), 16-24.

Shin, N. (2006). Online learner's flow' experience: An empirical study. *British Journal of Educational Technology, 37*(5), 705-720.

Short, J., William, E., & Christie, B. (1976). *The social psychology of telecommunications*. London, UK: John Wiley & Sons.

So, H.-J., & Brush, T. A. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationship and critical factros. *Computers & Education*, 318-336.

Song, S. H. (1998). *The effects of motivationally adaptive computer-assisted instruction developed through the ARCS model*. Florida State University.

Stipek, D. J. (2002). *Motivation to learn: Integrating theory and practice (4th ed)*. Boston: Allyn and Bacon.

Tsai, C.-W. (2009). Do students need teacher's initiation in online collaborative learning? *Computers & Education, 54*, 1137-1144.

Xie, K., & Ke, F. (2011). The role of students' motivation in peer-moderated asynchronous online discussions. *British Journal of Educational Technology, 42*(6), 916-930.

DESIGN AND PROPOSAL OF INTERACTIVE DISTANCE LEARNING MEDIA IN RURAL AREA

Eko Hadi Gunawan
Ridi Ferdiana
Sri Suning Kusumawardani

ABSTRACT

In Indonesia the condition of education in every region is still uneven. One of the problems is the limited number of educators and infrastructure that inadequate, especially in remote areas outside Java, such as in the islands of Sumatra. Internet that unavailable to reach the rural areas, inadequate a human resources and computer resources become obstacles to perform of distance learning process. In this paper we explain how the distance learning process can be done with the learning media that has low resources, can run without depend on the internet and student are able to do what can be done when they use distance learning actually such as accessing all the materials, questions, write evaluation for teachers and get updates both material and questions. Learning media system is divided into two parts. Client used by students and server used by teacher. From the server side, teachers can write materials and exams that will be answered by students. In client side, students can bring learning media and access all the subject matter and exams that have been published by the teacher wherever they are. The results of the test and evaluations from students and the updating of materials and tasks that published by the teacher can be updated when the learning media of students connect to the Internet and synchronize to the server. The result of testing of this learning was consuming the minimum resources and learning process is more interactive both

in terms of students and teachers.

***Keywords**: distance learning, rural area, learning media*

INTRODUCTION

Education in Indonesia has many unresolved issues, one of them is the limited access to the technology. The education in remote areas doesn't have adequate access to technology. Though education in Indonesia has a very important role for development our country. The Human Development Index or IPM in Indonesia has generally improved (BPS, 2006). But the highest and lowest IPM gap between Jakarta and Papua increased from 2006 to 2007 from 13.2 to 13.6. This shows that the growth of IPM gap between the regional was increased. One of the indicators used in determining IPM is education. This means that inter-regional education in Indonesia is still unevenly marked by an increase in the IPM gap.

The development of information technology shows the emergence of various types of activities based on this technology, such as e-government, e-commerce, e-education, e-medicine, e-laboratory, and others. All of them based on information technology Wardiana(2002). According to Dedi (2007), in theory, innovation in Information technology can be made according to user needs by adopting information technology theories. This technology can be utilized to solve the inequality of education in Indonesia, especially in rural areas. A solution that can be used by governments to handle many students to have equal education access is to use distance learning technology Keegan (2003).

The use of distance learning technologies is still very dependent on the availability of internet networks that exist in the region. If there is no internet available in that region, then the distance learning cannot be implemented. The problem of internet availability actually can be overcome by using learning media that can be accessed when available internet network or not available internet without leaving the essential of distance learning. Therefore, we required a learning media that can run without the availability of internet network, low resources and easy to use by people in rural areas

REVIEW OF LITERATURE

Rural area

According to the Directorate General of Rural Development, the rural areas have two main characteristics: Comparison of people with large area is quite large. The area in the countryside is still relatively large if we compared with the number of people who occupy in that area. So the density and profession of population is still low and based on the agriculture sector. The facilities, communication and transportation are mostly very simple, such as stone roads, simple asphalt roads, unpaved roads, and even paths. Transportation facilities are commonly found among other rural transport, water transportation, such as a simple boat or raft, even in some places there are still using the horse and cow. The Department for Environment, Food & Rural Affairs in Rural Urban Local Authority Classification or RUCLAD11 classifies that rural areas are areas with populations under 10.000.

Distance Learning

Distance learning is a set of teaching methods which teaching activities are carried out separately from learning activities. The separators of this activities can be physical or non-physical distance. The example of distance learning is e-Learning. Since the development of e-learning in 1999, the process of distance learning began to be implemented in various world of education. Distance learning is a breakthrough in education because the learning activities can be performed by students and teacher which does not required to exist at the same time and same place.

Several studies about distance learning media in rural areas were conducted by Syed(2004) located in Bangladesh and Zhou housed in China. In 2002 Syed et al conducted a survey that the technology used education at the time was still based on the main media of paper. Syed et al then tried to apply distance learning by using interactive teaching media that running over computer network. The architecture of the network is using the client server system. The results indicate that the distance learning process is highly dependent on the existing infrastructure in the region. Zhu et al (2008) developed similar research in China and used IPTV as an interactive learning media. From the two studies it can be said that the implementation of distance learning can be established if the distance learning technology is adequate such as using computer network or IPTV.

Z. Letray et al (2007) using distance learning media with a system called the COEDU. The system runs using an internet network that can be accessed through a web browser. And in 2016 Joshua et al (2016) conducted research on distance learning in western Papua. They created a new device called Virtual Class Box 5.0 by using video conferencing as one way of doing distance learning in rural area. From this point the teaching media of distance learning mostly using internet technology as a media of communication between schools and between users. The weakness of this technology for distance learning is availability of internets. In Indonesia, the internet still encountered for schools that belong to rural areas. When distance learning based on internets technology establish on the rural area, the problem that rise is the teaching media can't work properly because internet was unavailable or low bandwidths.

A new breakthrough rise from Ijtihadie et al(2010). They create some quiz on e-learning website that can run without using internet and able to synchronizing to server when media connected to the internet. Implementation of this research was the students open the page containing the quiz package over web browser in apple smart mobile. Then download the package and run that's package on condition without internet network. After the student finishes the quiz according that time scheduled by teacher, the website will store the data that has been input by the students through the quiz. The data then synced to the server when the phone is connected to the internet.

In this research, we tried to implement an interactive teaching media that can synchronize and worked in rural areas that unavailability of internet network, low computer specifications and easy to use by students.

METHODS

To know the obstacles that exist in the distance learning process in rural areas, researchers conducted interviews to teachers who are in the region belonging to the category of rural areas. From these interviews researchers get the main obstacles in distance learning that is the availability of internet networks, low computer resources and educator resources and students who are not familiar to distance learning. From this obstacle we know that we need a learning media that can work in rural areas that are unavailable of internet network, a low computer resources and easy to use by students who are familiar or not familiar with distance learning media.

System Specification

Smart Client Learning Material has a use-case diagram as shown in Figure 1. Smart Client Learning Material or SCLM consists of two types: Smart Client Learning Material for teachers and Smart Client Learning Material Desktop for students. The SCLM for teachers are packaged as websites that can be accessed through the internet network and SCLM for students are packaged as portable desktop applications that can be accessed by students with portable storage media without connecting to the Internet such as flash disk. Unavailability of internet in rural areas can be overcome by using a synchronization system contained in SCLM desktop applications. Desktop applications only require the Internet network when students want to update material and questions that have been published by teachers on the SCLM website.

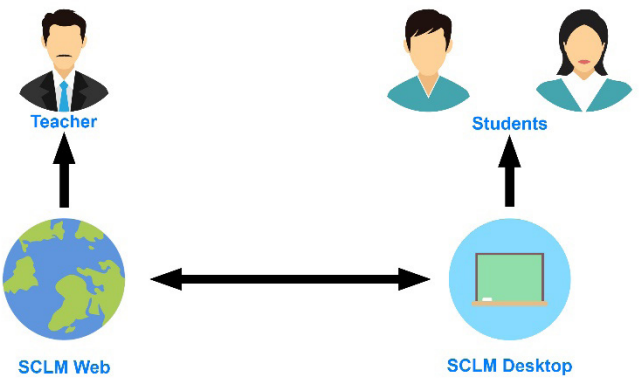


Figure 1. Interaction between Teachers, Students and Smart Client Learning Materials.

How SCLM applications work is a teacher who acts as author of writing material and questions on the smartclient.site web page. Then SCLM Web will save the material and questions into the database and publish it into json format. From the student side, when SCLM Desktop is run for the first time, SCLM Desktop requires synchronization to SCLM Website to sync material, questions and student accounts then store them in the SCLM Desktop database. Once the application is synchronized, students can read all material that has been published by the teacher or work on the problem wherever he is without connecting to the internet network. Synchronization process is only required when students have done all the question and material updates that have been published by the teacher.

Synchronization

The communication of Smart Client Learning Materials between teachers and students is through synchronization system over the internet. The SCLM website is created using php and MySQL programming and SCLM Destop system is created using php and SQLite are packaged into a portable webserver called PHPDesktop .. Communication between SCLM website and desktop was built using JSON. All content that has been published by the teacher will be stored in the MySQL database and published in JSON format. When the synchronization process on progress, the data will be published by server in JSON format will be requested and copy by SCLM Desktop then store into the SQLite database. In addition, SCLM Desktop also sends student data to SCLM server such as score and track record of student.

RESULTS AND DISCUSSIONS

Learning media testing conducted in rural areas of Riau province with the respondents of 7 students and teachers. Some tests are performed such as synchronization testing, CPU resource testing and usability testing using System Usability Scale. The scenarios used are teachers create student accounts and write then publish materials and questions on the SCLM website. Before the SCLM desktop application was released to students, SCLM Desktop are synchronized with the SCLM website. Once the SCLM desktop app is synchronized, the teacher delivers the app to students and one by one student attempts the app by utilizing all the features that are in the SCLM desktop app. After students try the SCLM Desktop application, students fill out a System Usability Scale questionnaire and to find out how much CPU resources are used by SCLM Desktop, as long as desktop SCLM applications run CPU resources are always monitored and recorded..

Synchronization testing

The benefit from SCLM System is the ability to run without any internet connection. It can be worked because SCLM has a synchronization system that can update the database between students and teachers when SCLM is connected to the internet. When the synchronization process is done by SCLM Desktop, SCLM Desktop will update its own databases containing user account, materials and questions as shown in figure 2. Also sends a track record of student such as score and evaluation into the SCLM Server database. From here the teacher outside the classroom can monitor track records of students as shown in figure 3.

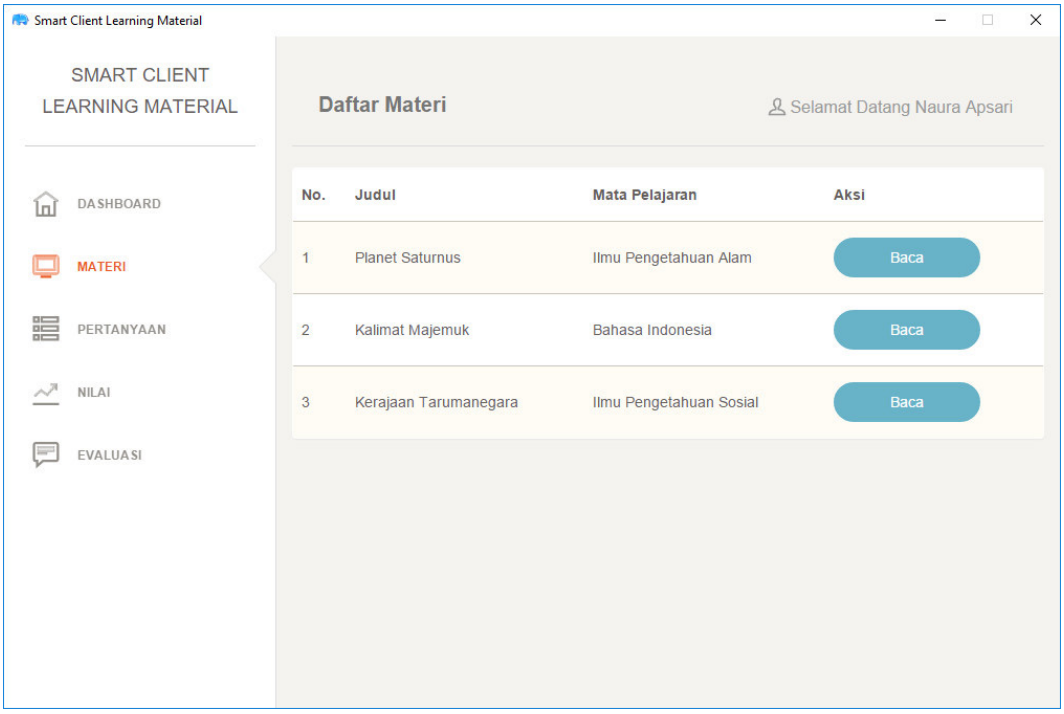


Figure 2. Interface of material list on Smart Client Learning Material students after synchronization.

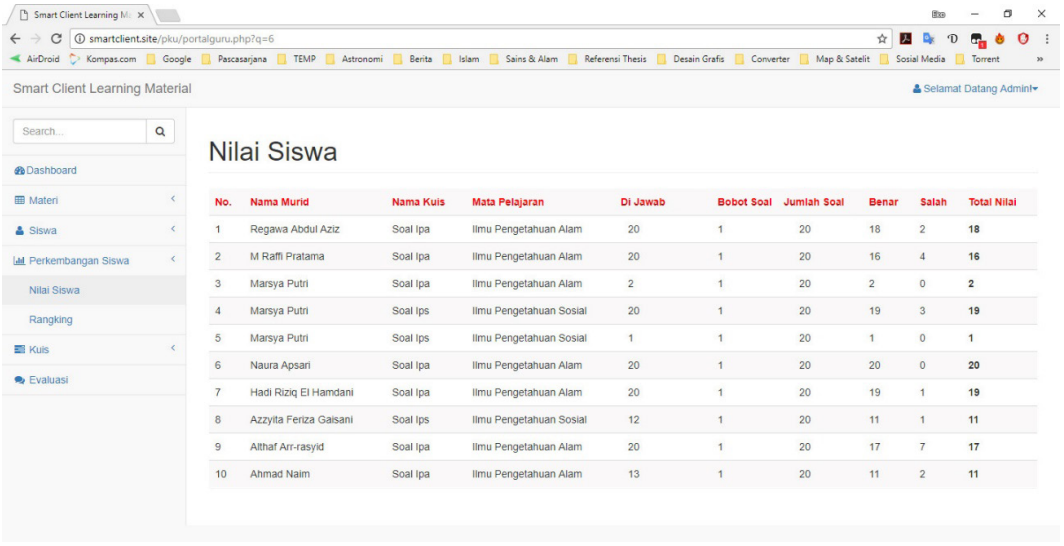


Figure 3. Interface of track record Smart Client Learning Materials teachers after SCLM desktop synchronize and sends the entire student track record to the SCLM web database.

CPU Test

For the evaluation of resources used by Smart Client Learning Material desktop, SCLM desktop was monitoring in performance of core processor and RAM during student running SCLM Desktop on a windows operating system. Several sample are taken randomly to represent CPU resources used by Smart Client Learning Materials. Data is shown in table 1

Table 1. CPU Resource Usage

Sample	Processor SCLM 1	Processor SCLM 2	RAM SCLM 1	RAM SCLM 2
1	9,4%	2,2%	27,6 MB	14,3 MB
2	10%	4,2%	25,6 MB	12.4 MB
3	7,1%	2,5%	13,2 MB	6,8 MB
4	8,5%	3,7%	16 MB	9,1 MB
5	11,8%	4,9%	29,4 MB	17,7 MB
6	10,1%	4,1%	26 MB	15,2 MB
7	9,3%	2,7%	28,3 MB	17,8 MB

Usability System

Interfaces and systems running on Smart Client Learning Materials are also tested using System Usability Scale (SUS). Based on the results of the survey, the value of SUS will be good if score above 68, and below the average if score under 68. The results from Smart Client Learning Material usability testing gives score 71. This means that usability of Smart Client Learning Materials has above average performance or good.

From testing CPU resources, Smart Client Learning material has a good performance for low computer resources. Usability testing of Smart Client Learning Material also provides very satisfying results because it can easily be used by ordinary students who live in the rural area. As a learning media, Smart Client Learning Material can bridge the distance learning in rural areas that unavailable of internet network. Smart Client Learning Materials require only 6.46% of the existing processor resources with an average consumption of 19 MB of RAM. The quality of user interaction design of Smart Client Learning Materials can be viewed from the high SUS score above average on usability test results.

CONCLUSION AND SUGGESTIONS

Smart Client Learning materials can be a solution for distance learning especially those that do not have internet network availability in their area. Consumption of low computer resources and a simple interface can help the process of distance learning without any constraints to computer resources, unavailability of the Internet network and easy to use for people who live in rural area. With the existence of Smart Client Learning Material, the use of remote technology can now reach the countryside.

REFERENCE

Peraturan Pemerintah Nomor 19 Tahun 2005 Tentang Standar Nasional Pendidikan.

Yuniati, Neni, et al. (2011). Pembuatan Media Pembelajaran Interaktif Ilmu Pengetahuan Alam Pada Sekolah Dasar Negeri Kroyo 1 Sragen. Jurnal Sentra Penelitian Engineering dan Edukasi, Vol. 3, No. 4, 2011

Keegan, Desmond. (2003). Foundations of Distance Education: Third Edition. Canada: Routledge

Wardiana, Wawan. (2002). Perkembangan Teknologi Informasi di Indonesia. Seminar dan Pameran Teknologi Informasi.

Syed Mahbubu R . Rahman Hakikur. (2004).“Technologies and Issues in Distance Education - Bangladesh Perspective,” IEEE.

Zhu Xiao Liang, Liu quan. (2008) “Education IPTV for E-learning in Rural Area,” International Symposium on Information Science and Engieering.

Z. Letray – M, Kovacs – L. Nyeki. (2007). “E-Learning Based Distance Education At Szechenyi Istvan University.” Innovations in E-learning, Instruction Technology, Assessment, and Engineering Education.

Joshua Nainggolan, Garrysen Christian, Kevin Adari, Yoanes Bandung, Kusprasapta Mutijarsa, Luki B. Subekti6. (2016).”Design and Implementation of Virtual Class Box 5.0 for Distance Learning in Rural Areas,” ICITEE 8th.

Ijtihadie R.M, Chisaki Y, Usagawa T, Cahyo H.B, Affandi A,. (2010) “Offline web application and quiz synchronization for e-learning activity for mobile browser,” in TENCON 2010 - 2010 IEEE Region 10 Conference.

The Linux Information Project, (10 August 2017), “Client/Server Definition,” available online at http://www.linfo.org/client_server.html

Department for Environment, Food & Rural Affairs, (10 August 2017), “Rural Urban Classification,” available online at https://www.gov.uk/government/collections/rural-urban-classification.

Engaging Students in Open Distance Learning Environments – A Personal Experience

Ku 'Azam Tuan Lonik, PhD

ABSTRACT

The age of internet shaped not only the way teaching and learning is conducted in conventional-traditional teaching and learning environments but also helps in extending the reach of education to a much wider audience. This is evidence in the form of an increase in the number of open-distance-learning (ODL) programs offered to the general publics. In general, the ODL institutions offering ODL courses can be divided into two broad categories, that is, the part-time course offerings as an off-shoot of the conventional higher learning institutions or as an independent e-learning institution. In either of this category, teaching and learning often take the form of a blended learning approach. While there are doubts that the ODL programs are comparable with the conventional learning, an overwhelming number of studies have shown that when the course materials and teaching methodology were held constant, there were no significant differences (NSD) between student outcomes in a distance delivery course as compared to a face to face course. Yet, from the perspectives of a teacher, due to the limited face-to-face interactions with students, the main problem one face is the challenge of engaging these ODL students. Success in engaging them will help to reduce the attrition rate among the ODL students. In conventional teaching and learning environment, teachers are often seen as knowledge disseminator, agent of change etc. Within this paradigm, 'good' teachers are expected to guide students with what

they need to know. This, however, is difficult to achieve in the open-distance-learning (ODL) environment whose learning space is the virtual Learning Management System (LMS) and students-teachers are separated with physical/geographical space. Real-time face-to-face interactions and contact between students and teachers are either non-existence or are very limited. This paper seeks to explore, based on practical experiences of the author, ways and means in engaging ODL students.

Keywords*: open-distance-learning, student engagement, e-learning*

INTRODUCTION

Open distance learning (ODL) offers students the flexibility and choice to decide when, where and how they want to study. The Malaysian Qualifications Agency (MQA) (2011), defines Open and Distance Learning (ODL) as "the provision of flexible educational opportunities in terms of access and multiple modes of knowledge acquisition". Following Ahmad et al., (2013), it stated that, flexible means the availability of choices for educational endeavours anywhere, anytime and anyhow; access means opportunity made available to all, freeing them from constraints of time and place; multiple modes mean the use of various delivery systems and learning resources.

In ODL, learning is supposed to be an independent exercises. Students-learners decides the pace in which they are comfortable in going through the course materials and set their own study schedule. e-learning has since become the backbone of ODL programs when integrated with the learning management system (LMS). In the White Paper on Education Transformation, UNESCO recognised the positive impact of e-learning on three aspects of learning namely engagement, motivation and attendance (UNESCO, 2012). Other research has also supported the findings that e-learning has a positive impact on education (see for example, Olson, et al, 2011; Yazdi and Zandkarimi, 2013).

MOOC (mass open online course) not only extend the reach of education but transformed also the ODL model. While ODL allows students flexibility in deciding when, where and how they want to study, MOOC extend the fundamental thrust of open learning to include and address the questions of what to study. With MOOC, students can choose certain elements of the programs or certain components of the course being offered. In hindsight, both ODL and MOOC benefits from the advent of the internet and especially the e-learning. Ruiz et al. (2006),

defined e-learning as "web-based learning, online learning, distributed learning, computer-assisted instruction, or Internet-based learning". Nonetheless, most studies on the benefit of e-learning are done on conventional students whereby e-learning is an add-on component of an otherwise conventional face-to-face learning environment. Within this environment, students are subjected to traditional lectures and tutorials, and their progress is within constant watch of the course tutors. This differs significantly with ODL students whose contacts with course tutors and fellow students are very minimal.

This paper attempt to address the issue of motivating ODL students whose contacts with course tutors and their fellow students are very minimal. Within this environment, with the view that the students are separated physically and spread over wide geographical areas, more often than not, these students can feel isolated, discontent, loss and helpless. Hence the added role of the course tutors within this environment is to mitigate these negative elements and to engage the ODL students to realise their potentials.

LITERATURE REVIEW

Role of Teachers

Kanuka (2011) identified six roles of teachers. Those six roles are, (a) teacher acts as a prominent disseminator of content and the student is a receptacle of this information, (b) teacher organise curriculum around problems and situations which relate to the experiences of the students, (c) teacher change the behaviour of people (students) in such a way that they can work with each other to design and build a society that minimizes suffering and maximizes the chances of survival, (d) teacher support individual growth and self-actualization, (e) teacher invoke changes in the political, economic, and social order in society via the intersection of education and political action, and (f) teacher develop rationality to bring about deepened awareness in meaningful touch with reality. Undoubtedly, within the ODL environment, teachers cannot perform all of these functions.

One major problem with ODL courses is the high attrition rates. Citing Carr, (2000), Angelino, Williams, and Natvig, (2007), reported that the attrition rates at the undergraduate classes taught through distance education are at the average 10 – 20% higher than face-to-face. This is due mainly to the problems of social isolations faced by the ODL students. According to Krajnc (1988) social isolation

can be measured by contacts with other students, contacts with individual tutors, group consultations, attendance to short seminars and the possibility to discuss personal learning problems with relatives and friends. Social isolations when compounded with family, work and financial commitments that they have to endure throughout their study – the three important challenges faced by the ODL students – can impact on students' participation, motivation and achievements.

e-Learning

Finlayson et al., (2006) argued that e-learning is a different kind of learning environment and learning experience for students which may directly affect knowledge acquisition and skill. They argued that e-learning allows students to easily interact with their teachers and with fellow students, thus allowing greater collaboration despite the physical barriers that exist. The increased ICT awareness and ICT literacy also helps reduce the technology-induced generational gaps between students especially in ODL environments where the age gaps between students tend to be huge and skewed towards the later age groups. Finlayson et al. (2006) found out that e-learning make students more receptive towards learning, especially by improving their attention, concentration and remembering. In addition, Oye, et al. (2012) also found that e-Learning has a significant effect on student's academic performances.

In order to achieve this, course managers should be pro-active so as to engage students for the sake of ensuring the success of not only the e-learning activities but also the success of education in general. Junk, Deringer and Junk (2011) outlined 11 key components that lead to success in the online learning environment which are (1) engage the student, (2) invite the student to contact the instructor when needing assistance, (3) provide online course materials that are well organized and visually pleasing, (4) post the class schedule or timeline containing clear due dates for assignments and discussion postings, (5) provide clear learning outcomes or objectives, (6) create presentation slides and activities that reinforce learning outcomes, (7) develop assignments that reinforce learning outcomes requiring students use higher level thinking to analyse and apply what they are learning, including requiring posting reactions to others' assignment postings, (8) interact with students in a conversational narrative making reference to assigned learning materials, (9) choose graphics, such as photos, video clips, or presentation slides that take a reasonable amount of time to download, (10) include hyperlinks to websites students must access and a brief description of site content, verifying that links are active prior to

student access, (11) provide frequent and descriptive feedback to students.

Singh, O'Donughue and Woron (2005) suggested that e-learning provides the opportunity for teachers to test students of real-life business situations. This test may not be limited to the business situations. Since students-learners are matured working adults, it is most likely that they will embarks on ODL program that can advance their career path and therefore will enrol in programs that befit their job description. This allows the teachers to test students and assigned tasks or assignments that suit their working experience thus enriching the knowledge sharing among the learning community.

Using data gathered fom a case study involving 6 FE colleges, comprises 70 staffs and 500 students and a survey of 508 tutors from 100 differenet FE colleges that attended National Training Network training events, Finlayson, et al. (2006) concluded that effective use of ILT (information and learning technology) has an important impact on student's immediate outcome in the area of knowledge and skills acquisition and development of autonomous learners. According to them, such positive impact depends very much on the effective use of ILT which include availability of equipment, use of ILT based on sound pedagogy, tutors' awareness of the benefit of ILT to support learning and teaching and the time allocated by tutors developing their ILT practices.

Students Engagement

Effective engagement requires course managers to understand that a) learning is personal and idiosyncratic which requires course managers to view students as individuals and they (the course managers) need to find out how students individually make sense of any lesson or explanation; b) every student behavior is a way to communicate something the student cannot express in any other way or doesn't consciously understand; and c) they (course managers) should never assume, since too often they can be wrong because low grades on tests do not necessarily mean that students haven't studied, instead to realise that the students may have been confused when the material was covered in class (Dodd, 1995).

School of Distance Education (SDE), Universiti Sains Malaysia.

Established in 1971, the SDE USM is the pioneer provider of higher education via distance learning in Malaysia. Currently the school offered four degree

programs, namely Bachelor Degree in Arts (Geography, History, and Literature), Bachelor Degree in Social Science (Anthropology and Sociology, Economics and Political Science), Bachelor Degree in Science (Biology, Chemistry, Physics and Mathematics) and Bachelor Degree in Management (Organisation, Finance and Marketing). These programs are an exact replication of the traditional full time programs offers by the various schools in USM.

The SDE adopts a blended learning approach in teaching and learning. Students are provided with reading materials in the form of modules or books. This can either be physical modules or books, or e-module or e-books. Tutorials are conducted through videoconference as well as web-conference on a scheduled basis. In addition, a three-week residential period is made compulsory each year. Although the residential period was scheduled for three weeks, the time allocated for each course for a face-to-face interaction with the course managers are limited in view of the number of courses registered by students. The video conference, web-conference and the residential period forms the face-to-face elements of the teaching and learning activities. While the video conference and web-conference are the electronic mediated interactions, the residential weeks forms the actual or physical face-to-face interaction between students and teachers and between their peers. In an earlier study, Ku Azam (2005) found that students look forward to this residential period. One of the reason is that during this three-week duration, students can fully concentrate on their study, free from any kind study-work-family distractions.

With the development of ICT, e-learning was adopted and used extensively in SDE-USM beginning 2005. This is integrated within the School's Learning Management System (LMS). Within this LMS, certain aspects of teaching and learning activities are conducted. This includes e-assignment, quizzes, e-notes, e-books, e-module, questions bank, the video lectures and forum. Traditionally, the forum is the most active part. This somehow has been replaced by social media platform especially the facebook. The use of ICT has also been extended to the administrative functions of SDE which include students' registration, e-post, and ebrary. The University Science Malaysia library has a collection of over 120,000 E-Books accessible to our distance learning students.

Engaging Students in ODL environments – a Personal Experience

This section shall outline several approaches to be considered for adoption in engaging students within the ODL environments.

Friendly and Attractive LMS environment

LMS should be friendly, attractive and above all comprehensive to attract students' attention. In the case of the SDE, we use Moodle as our LMS platform. This can be accomplished by giving attentions to details. A comprehensive LMS should provide a) an overview of the course (subject), b) the course learning outcome, c) an overview of each of the lessons to be covered in the course, d) the lessons' learning outcome, and e) lesson plan (academic planner). Course managers should be proactive to update materials and especially to guide students along the way. It is advisable that these materials are made available as time progress, or superficially as the lesson plan progress. Although the materials might have been there from previous semester, but as in Moodle, this can be turn-on and turn-off with the hide and show button.

A lesson plan would help students plan their study. This lesson plan can be organised by either weeks or month, so that students knows whether they are lagging behind or otherwise.

Organised lessons in sequence.

The lesson plan would require course managers to organise lesson in sequence. Course managers/tutors should treat on-line lessons similar to face-to-face lectures. In face-to-face environments, lectures are conducted sequentially. Similar approach should be adopted in the ODL environments. The present author find it beneficial to organise lessons sequentially according to topics. This is helpful in facilitating discussion either in the form of forums or chats. Each topic should have a synopsis to provide an overview of what to cover.

Organising the course through topics can be accomplished in Moodle by blocks. Each block refers to different topic. In addition to its own synopsis and a learning outcomes, each block can have its own activities which include additional reading materials, quizzes, chats, video recordings, power points slides (subject to preferences which can be uploaded in each of these blocks).

In SDE, tutorials are conducted via videoconference or web-conference. The videoconference and web-conference are scheduled prior to the start of the academic year. The recoding of these videoconference and web-conference sessions are uploaded into the portal. Lessons can also be recorded by the course manager. These recordings are made wither with dedicated software such as Camtasia or are done in our in-house studio.

As with the lesson plan, students should be provided with a time table to guide them when each of the lesson shall begin and when it will end. This will ensure that students keep tract of their progress and prepare them for the lesson.

Since ODL students are mostly working adults with other work-family commitments, a degree of flexibility should be given. Thus, forum can be opened throughout the year and chats, which are normally constrained by time duration, should be archived.

Group projects

Pratt (2015) suggested that ODL students must be made to feel that they are part of a community, that is the learning community. Based on observations made from previous studies, Pratt reported that "distance students who feel part of a community of learners tend to be more satisfied and learn more effectively" (p.20). Apart from reducing the problem of isolations, feeling part of learning community will encourage the ODL students to compete, communicate and collaborate with each other.

In overcoming the problem of isolation, group project should be encouraged. Studies by Jacobs (2014) suggested that in implementing e-learning, students should be encouraged to embark on group projects. Despite being separated by geographical divide, group projects can be fulfilled with the help of the various mode of communications available in this age of information super-highways.

Group projects has an advantage over individual projects whereby students are forced to work together despite being separated by physical and geographical locations. From our own experiences, this physical or geographical separations does not hinder or discourage students from interacting between themselves. The development of ICT and the wider coverage of ICT open up the communications channels between students.

Course tutor can facilitate this communication by allowing the LMS to be used as a platform for students to communicate among members of the groups by

creating groups within the course page. Apart from that, by allowing LMS to be used as communication channel, course tutor has the opportunity to intervene when necessary to guide students in the group projects.

1. *Encourage Students to Think*

   Course tutors should encourage students to think. In LMS, such as Moodle, this can be accomplished in two ways. First, thorough such features as forum and chat. Second, through quizzes. This is more of a stick-and-carrot approach. While the former is a mere encouragement, the later rewards students by giving marks and can constitute a component of the continuous assessments. Dodd (1995) argued that failure to participate in forum or chats, or fails in test is a way students tried to convey a message to the course tutor. By paying special attention to the participation in forums and chats, and in answering quizzes, course tutor can take steps to mitigate the situations thus preventing failures in the course.

2. *Open up the Communication Channels*

   Course tutors should open up the communication channels between them and the students. In ODL programs, majority of students are adult learners with work and family commitments. These students when they were young were most probably does not meet the qualifications to enrol in tertiary educations. ODL programs provide them the opportunity to pursue a tertiary education. It should not be a surprise if these students feel inferior despite the age advantage and work experience they have. Inferiority prevent them from opening up to the course tutors in public. Instead, there would very much prefer a private channel of communications. By opening up various communication channels, course tutors can help these students to keep up with the demand of the course. Communications should be a wide as possible, which may include emails, Facebook, messages, WhatsApp, WeChat, tweeter etc., in addition to conventional phone calls. As for the personal experience or rather preference of the author, phone calls are least preferable for the reason that other means of communications mentioned above can be saved for future references in cases of disputes or complains.

   It is interesting to note that Petrovic et.al., (2013) discovered that while students use Facebook to exchange information about the course among themselves and that they find it to be more convenient, yet when compared to Moodle, Facebook distract them from learning (average

score of 3.18 for Facebook and 1.28 for Moodle. This is understandable because Facebook is a social media whose coverage are diverse and its main purpose is not for education as compared to Moodle. Nonetheless, this does not mean that this channel should not be pursued. The author has experienced that by using Facebook, feedback or rather acknowledge from students is spontaneous.

CONCLUSIONS

In most of ODL programs, the main study materials are the modules; a well-structured study materials produced specifically for the ODL students. A well-structured module, prepared with ODL students in mind, consists of an easily understood materials accompanied with in-text exercises and the various pit-stops to allow pause, explain concepts, referenced to other sources such as the internet, would allow students to digest the course contents.

The strategies discussed in this paper can act as compliments to this well-structured course modules.

REFERENCE

Ahmad Hj. Mohamad, John Arul Philips, Santhi Raghavan, Wahid Razzaly (2013), Code of Practice for Open and Distance Learning - Kod Amalan Pembelajaran Terbuka dan Jarak Jauh (dual-language). Malaysian Qualifications Agency: Petaling Jaya.

Angelino, L.M., Williams, F.K. and Natvig, D. (2007), Strategies to Engage Online Students and Reduce Attrition Rates. The Journal of Educators Online, Volume 4, No. 2.

Bergmann, J., and Sams, A. (2012). Flip your classroom: Reach every student in every class every day. Washington, DC: ISTE; and Alexandria, VA: ASCD.

http://www.ascd.org/publications/books/112060/chapters/Why-You-Should-Flip-Your-Classroom.aspx

Bourlova, T. and Bullen, M. (2005). The Impact of E-Learning on the Use of Campus Instructional Space in R.W.H. Lau et al. (Eds.): ICWL 2005, LNCS 3583, pp. 397 – 405. Springer-Verlag Berlin Heidelberg.

Depth, D.K., Ng, A., Do, C. and Chen C. (2013). Retention and Intention in Massive Open Online Courses.

http://er.educause.edu/articles/2013/6/retention-and-intention-in-massive-open-online-courses-in-depth

Dodd, A. W. (1995), Engaging Students: What I Learned Along the Way Strengthening, Student Engagement, Vol. 53, No.1 (September), Pgs. 65-67. Dood, M. (2015). Evidence for the Flipped Classroom in STEM. New York PGCAP teaching course. Retrieved from

https://www-users.cs.york.ac.uk/~miked/publications/flipped_classroom.dodds.pdf

Dron, J. and Anderson T. (2014). Teaching Crowds – Learning and Social Media. Edmonton: AU Press.

Finlayson, H., Maxwell, B., Caillau, I. and Tomalin, J. (2006). e-learning in Further Education: The Impact on Student Intermediate and End-point Outcomes. Centre for Education Research, Department for Education and Skills, Sheffield Hallam University School of Education.

Jacobs, P. (2014). Engaging students in online courses. Research in Higher Education Journal Volume 26.

Junk, V, Deringer, N and Junk, W. (2011). Techniques to engage the online learner. Research in Higher Education Journal, 101-115.

Kanuka, H. (2008), Understanding e-Learning Technologies-in-Practice through Philosophies-in-Practice, in Anderson, T., The Theory and Practice of Online Learning. Edmonton: AUPress.

Krajnc, A. (1988). Social Isolation and Learning Effectiveness in Distance Education. Ziff Papiere 71. Zentrales Inst. fur Fernstudienforschung Arbeitsbereich. FernUniversitat, Hagen (West Germany). http://files.eric.ed.gov/fulltext/ED301667.pdf

Ku Azam T.L (2005). Effectiveness of Videoconferencing, Intensive Course and e-Portal in a Distance Learning Economics Programs. Malaysian Journal of

Educational Technology. 5(1).

McManus, D. (2001). The Two Paradigms of Education and the Peer Review of Teaching. Journal of Geoscience Education. Vol. 49, No. 6: pp. 423-434.

Olson, J., Codde, J., deMaagd, K., Tarkelson, E., Sicnlair, J., Yook, S. and Egidio, R. (2011). An Analysis of e-Learning Impacts & Best Practices in Developing Countries with Reference to Secondary School Education in Tanzania. The ICT4D Program Michigan State University. East Lansing, MI 48824 USA.

Oye, N.D., Lahad, A., Madar, M.J. and Ab.Rahim, N. (2012). The Impact Of E-Learning On Students Performance In Tertiary Institutions. IRACST – International Journal of Computer Networks and Wireless Communications (IJCNWC), ISSN: 2250-3501Vol.2, No.2, April 2012

Park, J. (2007). Factors related to learner dropout in online learning. In Nafukho, F. M., Chermack, T. H., & Graham, C. M. (Eds.) Proceedings of the 2007 Academy of Human Resource Development Annual Conference (pp. 25-1–25-8). Indianapolis.

Petrovic, N., Jeremic, V., Cirovic, M, Radojicic, Z. and Milenkovic, N. (2013). Facebook vs. Moodle: What Do Students Really Think? ICICTE Proceedings.

Pratt, K. (2015). Supporting Distance Learners: Making Practice More Effective. Journal of Open, Flexible and Distance Learning. 19(1): 12-26.

Reich, J. (2014), MOOC Completion and Retention in the Context of Student Intent. EduCause Review.

http://er.educause.edu/articles/2014/12/mooc-completion-and-retention-in-the-context-of-student-intent

Ruiz, J.G., Mintzer, M.J. and Leipzig, M. (2006). The Impact of E-Learning in Medical Education. Academic Medicine, Vol. 81, No. 3.

Singh, G., O'Donoghue, J. and Worton, H. (2005). A Study Into The Effects Of e-Learning On Higher Education. Journal of University Teaching and Learning Practice.

http://jutlp.uow.edu.au/2005_v02_i01/pdf/odonoghue_003.pdf

Wagner R. (2011). Educational Technology: Social Media Tools for Teaching and Learning. Atlantic Training Education Journal. Vol 6, No.1:51-52

Weimer, M. (2014), She Didn't Teach. We Had to Learn it Ourselves. The Teaching Professor Blog, Sept. 10th, 2014. http://www.facultyfocus.com/articles/teaching-professor-blog/didnt-teach-learn/

UNESCO (2012). The Positive Impact of e-Learning – 2012 Update. White Paper: Education Transformation.

http://www.unesco.org/fileadmin/MULTIMEDIA/HQ/ED/pdf/The%20Positive%20Impact%20of%20eLearning%202012UPDATE_2%206%20121%20(2).pdf

Yazdi, S. M. and Zandkarimi, G. (2013). The Impact of E-Learning on some Psychological Dimensions and Academic Achievement. International Journal of Education and Learning. Vol.2, No.2: pp.49-56 (http://dx.doi.org/10.14257/ijel.2013.2.2.05)

GAMIFICATION AND LEARNING

Increasing Student Online Session Engagement through Gamification

Roland Lorenzo M. Ruben

ABSTRACT

This paper focuses on the use of gamification in increasing the students' engagement in the online sessions of the class. The researcher perceived significant changes in the students' use of the online sessions because of gamification. Gamification is a new feature in the Schoolbook, the university's learning management system (LMS). The author adopted a flipped classroom model where 50% of the class sessions are done online. At the start of the class, the students were told that the class is gamified. The game mechanics were introduced and the use of points, badges and leaderboards with the purpose of motivating students to focus also on the online part of the instruction.

The study was conducted for one year covering the first and second semester. During the first semester, gamification was used in a French Language class and in a Basic Logic class in Philosophy during the second semester.

The students answered an evaluation on the use of gamification at the end of each semester. During the conduct of the gamified online sessions, the performance of the students—in their online quizzes, online submissions, discussion forums, and reading of the lesson materials —had been very satisfactory. By and large, gamification has increased students' engagement in the online part of the flipped classroom model. This has been clearly evident in the responses and

reactions of the students to the gamification of the online sessions.

***Keywords**: e-Learning, Blended mode of Learning, Flipped classroom, Gamification, motivation*

INTRODUCTION

Student engagement is a very important factor in education. That is why teachers try to find ways to engage their students in their classes because learning becomes successful when students are engaged. Whitson said that Appelton (1989) claimed that increases in student engagement are correlated to increases in positive student learning outcomes such as higher GPA, higher attendance rates and higher classroom participation (Whitson, 2009). In education, student engagement refers to the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they must learn and progress in education (Abbot, 2014).

Nowadays with the advent of technology, the students are more distracted than ever. Games has become mobile and it has captured the attention of the students. It was already difficult to get their attention without the technology, now it has become even more difficult with it. So, instead of telling the students to get off the games, why not enter their world and gamify the classroom? This way, we get their attention and harness their interest in gaming by diverting their focus to the lessons which are gamified. As the cliché goes, if you can't beat them, join them.

E-learning came to the school a few years ago. It started with an in-house learning management system developed by the school's IT center. In 2014, De La Salle University - Dasmariñas subscribed to NEO LMS as the school's learning management system. The virtual learning environment was named Schoolbook. However, even though, it was an online environment, the kind where the youth thrives, it was not smooth sailing, at first. Since it is new, online engagement is difficult. Even if it means having readily available lessons materials, having at least three attempts in online assessments and some days off from the classroom, still, the students prefer the traditional style of instruction. They still prefer face-to-face instruction and being spoon-fed with lectures. And when a teacher uses online learning, students say that they are not teaching. They often forget the online deadlines, ignore the uploaded materials and even forget their passwords.

Student engagement is an essential part in learning, much more in e-learning. Unlike in the classroom where somehow you can control the attention of the students, in e-learning, we somehow lose that control because the students are on their own. When they open the Schoolbook, they can also open other sites, like YouTube or Facebook that would distract their attention from the task at hand. Since the conduct of the class is flipped, the students are expected to read the lessons and complete assessments before coming to class. Oftentimes they neglect this part and just come to class without having read the lesson materials.

This paper seeks to show that the use of gamification influences the students' motivation and engagement. To find out if indeed this is so, the researcher seeks the answers to the following questions: First, could the achievement system have had any effect in their motivation and usage behavior? Second, could the factors that made students motivated by gamification changed their outlook on the online session?

While there is no magic pill or silver bullet, the researcher believes that gamification will help engage students in their online classes. Looyestyn, et al (2017) said that gamification is the recent trend that offers to increase engagement through the inclusion of game-like features like points and badges, in non-game contexts.

REVIEW OF LITERATURE

The study has used the Flow Theory in showing student engagement in gamified online sessions. Whitson, states that Csikszentmihalyi (1990) said that it is a theory of optimal experience based on the concept of flow – the state in which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it (Whitson, 2009). To be in flow means the complete immersion of a person within a task (Sailer, 2013). According to Whalen (1999), the term flow refers to an optimal state of immersed concentration in which attention is centered, distractions are minimized, and the subject enjoys an autonomous interaction with the activity (Whitson, 2009).

Certain studies have shown the potential solution to student engagement in gamification.

The application of game elements in a non-game environment is not exactly a new idea by gamification designers or researchers. Similar approaches can be

observed in loyalty programs (Sailer, 2013). Roberts (2014) said that gaming is also being utilized to engage employees and ultimately to change their behavior. Cheong (2014) supports this idea by saying that one objective of gamifying learning is to stimulate the same motivation and engagement that gamers have towards games in learners toward education. By increasing learner motivation and engagement, it can be predicted that learning will improve.

Looyestyn (2017) concluded that gamification promises to increase engagement with online programs. Barlow (2016) said that the introduction of games into the classroom environment, with stars, levels, competition and goals, increased the motivation of students to complete a greater quantity of schoolwork. They have seen students more excited and more motivated to learn. Rewards, according to Ryan (1996), refer to the gamification factors that satisfy learners' shared need and motivate them to engage in learning activities (Chang, 2016).

While game mechanics and game design are essential to gamification, the researcher discovered that the kind of rewards that the students received while performing their tasks is crucial in motivating them and getting them hooked in their tasks.

METHODS

The research design is basically qualitative. The students answered an end of the course survey at the end of the semester. The survey instrument has two sections: the first one was about the demographic details while the second was about the participants' attitudes towards gamification and their opinion on how useful particular game elements, such as rewards, could be in their class standings. They were also asked what rewards they would like to add in the current set.

Materials

Twelve classes composed of college students answered the survey at the end of each semester last school year 2016-17. In the first semester, students from French language classes while in the second semester, students from Logic classes were part of the study.

Subject and procedures

Two hundred sixty-seven students from different colleges and in different year levels answered the survey out of 377 who are part of a blended class. They answered anonymously 4 questions that deals with their experience in gamification.

Characteristics Gender	Count	%
Male	108	28.65%
Female	158	41.91%
Age		
15-17	13	3.45%
18-20	224	59.42%
21-23	30	7.96%
24-26	0	0%
27-older	1	0.27%
Year Level		
1st	3	0.8%
2nd	128	33.95%
3rd	100	26.53%
4th	33	8.75%
5th	2	0.53%
College		
CTHM	105	27.85%
CEAT	58	15.38%
CLAC	53	14.06
CBAA	31	8.22%
CSCS	20	5.31

Table 1. Demographics of surveyed students

During the first day of class, the students were oriented to the conduct of the course. It was a blended class using the flipped classroom model. All course materials, lesson content and assessments, were already uploaded in the Schoolbook. All enrolled students were automatically included in the game.

Everyone started with no experience points (XP). They earned points when they open the lesson materials and earn more when they pass the assessments. The level points increased exponentially. They also earned bonus points when they complete a lesson or module. The assessments had a gateway. During the prelim period it's 60%, 80% for the midterm period and 100% in the finals. The rule was that if they don't get past the gateway they will not receive the points. Unlimited attempts were given to the students so they just kept on trying till they got past the gateway or much better when they got a perfect score. Rewards and badges were given when they reached certain levels. Not all levels had rewards. There were also surprise rewards that were given in some assessments and achievements. The different levels were given online game-like names. Level 1 is settler and they work their way up to Deity level. The eleventh level was the highest level and the reward in this level is a final task exemption lottery ticket. It means they will have a chance to be exempted from doing the final task.

The first level was very easy to achieve, and also the second and third level. As they advanced easily they got hook in the game especially when they received rewards along the way. The idea was to give rewards that would be beneficial to them. Unlike other games, where players only received badges, in this game it was created that rewards would help them earn more points and go up in the levels. Rewards are in the form of Late Pass, Late Submission Pass, Assessment Exemptions, Excused Absence rewards, One More Try, Final Task Exemptions lottery tickets, etc. From this set of rewards, what is most beneficial for them is the late submission pass reward as shown in fig. 2.

Figure 2. Rewards that are most beneficial

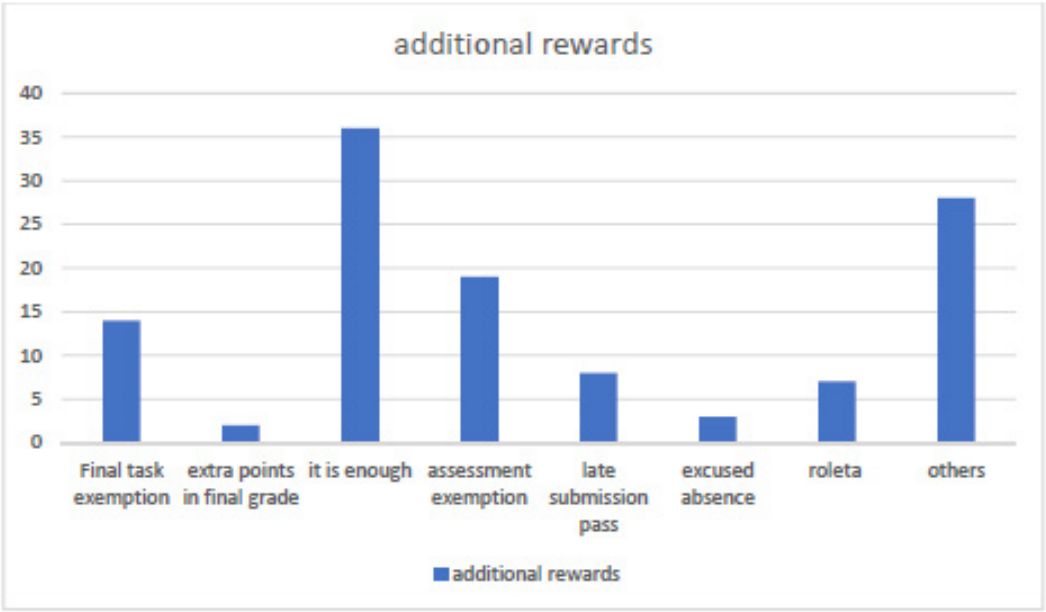


Figure 3. Additional rewards

RESULTS AND DISCUSSIONS

1. How do you feel about the use of points and earning achievements (badges, rewards) for different activities?

The leaderboard in the Schoolbook only shows the top ten students. Most students loved the idea of being on top of the leaderboard. One student said, "It makes me strive harder than I would normally be because I kind of liked the idea of being in the leaderboard." Being in the leaderboard made them confident and proud of their achievements.

Looyestyn (2017) stated that leaderboards may be a particularly useful form of gamification to increase engagement. Sailer (2013) mentioned that from a trait perspective general classes of motives and needs can evoke motivation. He said that the use of the leaderboard showed two important motives: the achievement motive and need for power. When a student has a strong achievement motive, having a leaderboard that shows achievement, success and progress will definitely motivate him to continue on. A student asserted, "It made me strive harder because nothing beats the feeling of seeing your name on the leaderboard."

Some never had a chance to see their names in the Dean's list or in the honor roll,

and seeing their names on the leaderboard gave them a sense of achievement. This sense of pride pushes them to do more. One student said that in the higher level, the points had become too high but it did not stop him from doing more. Looyestyn (2017) said that leaderboards are more tangible and can relate more to real life.

Barlow (2016) said that the introduction of games into the classroom environment, with stars, levels, competition and goals, increased the motivation of students to complete a greater quantity of schoolwork. They have seen students more excited and more motivated to learn. One of the students in the class, said that even though there are lots of assessments, it doesn't really matter, *'go lang ng go!'* (just keep it going!). The gamified classroom had a positive effect on the students, "because we were motivated to pass our assessments and open the lessons."

2. Did the achievement and reward system had any effect on your motivation and usage behavior?

Students who were positive about competition commented favorably on many items. They liked the ranking system. They enjoyed seeing themselves climbing past "the competition" as the project progressed. As the ranking was visible to all, there was an extrinsic competitive motivation, where achievement was experienced because of relative positioning. One student said, "I was monitoring my position the whole way along and that's what was motivating me." "Yes, it had. Because without it, maybe I won't be able to do good in my assessment, it won't motivate me to do well and it would only bore me," another remarked.

As a student is focused on the academic stuff, he becomes aware of that one task and Whitson (2009) said that this student will not be easily distracted from that task. The merging of action and awareness, and concentration on the task at hand are characteristics of Flow. A student said that when a new question came out, everyone was rushing to their phones and stuff and you were kind of obsessed by it and you wanted to do really well. Another remarked, "it had a big effect on myself because I usually don't study due to work but the system taught here made me really reach for my goals and made me study hard." The students spoke of having changed their study habits because of the success that they experienced and the rewards they gained. One student quipped, "Yup, earning points were kinda addicting!" It also helped that the goals were clear from the start and feedback was immediate.

One of the clear motivating factors for those who enjoyed the project was its novelty. For the students, it represented a welcome break from the traditional learning activities, they encountered. One student mentioned that he was amazed because this was the first time he encountered such learning experience. He said that it was challenging and fun. Another expressed, "I think there was more of a "want" to do it, as opposed to a "need" … There was definitely an element of fun to it."

3. What rewards do you see that is most beneficial for you?

Among the rewards that were won by the students, the Late Submission pass reward was the most beneficial. Some students tend to procrastinate in answering assessments or in submitting assignments. When they do, they usually miss the deadline. With the late submission pass reward, they can answer or submit missed assessments. One student said, "Yes, it is very helpful in following up a missed assessment because as a dormer it is hard for me to do assessment without a Wi-Fi, laptop and having a curfew. It helps us following up missed assessment."

The second most beneficial is the assessment exemption reward. This is a no brainer. Who wouldn't want to be exempted from a task? This reward is like a 'rest reward' for them. After accomplishing some tasks, they get a respite from incoming tasks, at least once.

The third most beneficial is Excused Absence reward. The school has an attendance policy. The students are allowed only seven absences. If they incur more than seven absences they are automatically dropped from the course and received a failing grade. Having an excused absence reward will lessen those number of absences and helps them stay on the course.

Many students were motivated by the rewards that proved beneficial. The notion that rewards help them recover from missed assessments or from very low scores that made them get good grades. It was both novel and motivating. One student said that "the rewards were life-savers." Another remarked, "I feel competitive and eager to unlock badges and rewards and gain points as well as staying within the top of the leaderboard." One student said that, "Yes, achievement and reward system effect my motivation in school. I feel like i deserve it. When you really try hard on something, and you get a reward, it is an awesome feeling. It is the energy that push me forward."

4. What other rewards would you prefer after achieving levels?

When they were asked what additional rewards they would like, 36 out of 117

said that the rewards are enough. A student concluded, "I honestly can't think of any other rewards. The existing rewards are already very satisfying enough."

There are also a good number that suggested more rewards. In figure 3, 28 out 117 (23.97%) respondents suggested rewards like, instant passing grade or an immunity from discipline officers, etc. One said that an easy pass reward would be great because it assures a passing grade. Another wanted a more practical one, something that will be shared with the whole class, like some sweet treats. An immunity reward would be great, declared one student. Something that would excuse them from a minor/major violation.

This research has shown that the students did not mind the task at hand as long as they get rewarded in the end.

CONCLUSION AND SUGGESTIONS

Gamification is effective in increasing student online sessions engagement. The students looked forward to the next lessons and assessments because they earn points when they do so. Earning points means being on the leaderboard and earning rewards. This research has pointed out a practical contribution to gamification. Leaderboards are good motivators but if a student finds himself/herself in the bottom and feels that his/her classmates are way too competitive for him/her, that situation would demotivate the student. However, rewards systems would counteract that demotivating factor. One student said, *"gaganahan talaga pag may reward"* (it really motivated me to do more when there are rewards). The reward system played a very important role in the researcher's gamified classroom. The students wanted the rewards because it proved beneficial to them. The researcher had seen changes in his students' attitude toward learning.

Here are some points that teachers must consider before gamifying their classrooms. First, gamification needs a good game design. It is not enough if you have the basic game mechanics, you should think how to use them accordingly. Second, look for a framework or a theory that would support your game. A good theory on game design is flow theory. More studies on the application of flow theory on game designs is highly encouraged. Finally, develop a good reward system.

Making a comparative study between blended classes who are gamified and non-gamified to see the difference of motivation and engagement must also be done in the near future.

ACKNOWLEDGEMENT

The researcher would like to thank the Center for Innovative Learning Programs for their support and his colleagues, Mr. Loreto Camiloza and Mr. Edwin Lineses, for sharing their expertise and precious time.

REFERENCES

Student Engagement in Online Learning: What Works and Why. (2014). *ASHE Higher Education Report*. Vol 40 Issue 6, p1-14.

Barlow, T., Fleming, B. (2016). A science classroom that's more than a game. *The Journal of Australian Science Teachers Association,* Vol. 62 Issue 2, p31-37.

Buckley, P., Doyle, E., Doyle, S. (2017). Game On! Students' Perceptions of Gamified *Learning*. *Journal of Educational Technology & Society*, Vol 20 Issue 3, p1-10.

Chang, J. W., & Wei, H. Y. (2016). Exploring Engaging Gamification Mechanics in Massive Online Open Courses. *Educational Technology & Society*, 19 (2), 177-203.

Cheong, C., Filippou, J., Cheong, F. (2014). Towards the gamification of Learning: Investigating Student Perceptions of Game Elements. *Journal of Information Systems Education*, Vol 25, Issue 3, p233-244.

Çeker, E., Özdamlı, F. (2017). What 'Gamification" is and what it's not. *European Journal of Contemporary Education,* Vol. 6 Issue 2. P221-228.

Roberts, B. (2014). Gamification: Win, Lose or Draw. *HR Magazine*. Vol 59 Issue 5, p28-35.

Jen-Wei Chang: Hung-Yu. (2016). Exploring Engaging Gamification Mechanics in Massive Online Open Courses. *Journal of Educational Technology & Society*, Vol. 19 Issue 2, p177-203.

Looyestyn, J., Kernot, J., Boshoff, K., Ryan, J., Edney, S., Maher, C. (2017). Does gamification increase engagement with online programs? A systematic review. *PLoS ONE*, Vol. 12 Issue 3, p1-19.

Sailer, M., Hense, J., Mandl, H., Klevers, M. (2013). Psychological Perspectives on Motivation through Gamification. *Interaction Design and Architecture(s) Journal*.

Shearer, N. (2016). The Role of Behavioral Psychology in Gamification. American Academy of Advertising Conference Proceedings. P141-142.

Whitson, C., Consoli, J. (2009) Flow Theory and Student Engagement. *Journal of Cross-Disciplinary Perspectives in Education*, Vol 2 No.1 p40-49.

EVALUATION OF 'PRODIGY', AN ONLINE EDUCATIONAL GAME-BASED PLATFROM ON MATHEMATICS

Joseph Ma. Steven S. Cabalo
Rolando G. Panopio

ABSTRACT

Students of the 21st century are students of the future. For students to be engaged and motivated, the "intellectual barrier" between the teacher and the student is removed, through a student-centered approach. This can be further aided by the concept of gameducation, or gamification of education alongside online communities. One of the novel online educational game-based platforms is known as Prodigy - a free accessible platform for both teachers and students studying Grades 1 - 8 mathematics. With its two types of interface, for the teacher and for the student, this study is limited to the student interface only, and access to computers with internet connectivity may be limited in certain areas of the country. An evaluation of the platform was conducted by both the Grade 7 mathematics teacher of the University of the Philippines Rural High School (UPRHS) and UPRHS students of Grade 7 Tindalo. Using a forced-choice scale model (1 - Strongly Disagree; 2 - Disagree; 3 - Agree; 4 - Strongly Agree) and open-ended questions, results yielded a positive perception for the categories "Learning" (mode of 4), "Ease of Use" (mode of 4), "Ability Levels" (mode of 3), and "Technical Quality" (mode of 4). The teacher and most students recommend the use of Prodigy in their mathematics classes as it aids in student learning. Notable pitfalls of using the said platforms are time constraints or management and the

presence of built-in calculators. Further studies are recommended in the field of gameducation and online educational game-based platforms.

***Keywords**: evaluation, gameducation, high school, mathematics, Prodigy*

INTRODUCTION

21st century students are students of the future. They are known to have difficulties in maintaining focus, attention, and interest; those qualities are needed to engage and motivate students. Thus, constructivism is one option. McCray (2007) defined Constructivism, such that it "views learning as a process in which the learner actively constructs or builds new ideas on concepts based upon current and past knowledge." McCray also added that the techniques exhibited by Constructivism "may improve students' academic performance and achievement" where its aim is for the student to excel and attain academic achievements.

Since students are engaged through the help of the instructor or teacher, the "intellectual barrier" between the teacher and the student is removed, through a student-centered approach. Courville (2011) noted that before the boom of technology (internet, mobile devices) and its integration in education, instructors and teachers need to be engaged face-to-face with the learning community, such that it needs "physical proximity". Courville added that through the help of technology, the constructivist point of view can be applied, through the context of "online learning communities" where students and teachers alike can take part in socialization among them.

Notably, the concept of gameducation can be seen alongside online communities. Gameducation is simply a combined term for gamification and education. According to Jackson (n.d.), "gamification can be integrated effectively into education to motivate students and enhance learning". Gamification of education can be integrated using digital or video games, such that Deterding et al. (2011a) as cited by Jackson (n.d.) elaborated that the elements of video games are important "to improve user experience and user engagement" which can be applied in the context of students. Gamification of education is not simply centered on playing games, but it also needs understanding about certain concepts. Dickey (2005) as cited by Glover (2013), enumerated three (3) basic components of a game: goal-focused activity (the winning component), reward mechanisms

(leaderboards, prizes, and achievements), and progress tracking. Glover also pointed out that this concept of games is beneficial for student engagement and motivation because the gamer's efforts are cordially being rewarded, thus being "fundamental in gamification."

Prodigy is an online gameducation platform provided by SMARTeacher Inc. that can be accessed at www.prodigygame.com. According to its website ("Prodigy", 2016), *Prodigy* is a free accessible platform for both teachers and students studying Grade 1-8 mathematics, with an upgrade option (this option has a fee, but upgrading simply unlocks extra content with "no impact on *Prodigy*'s educational quality"). The game has various options for student assessment, including formative, diagnostic, and summative assessments; such assessments are built-in for students to think that the questions are part of the game. It is inclined for both elementary and high school students, with its Pokémon-like theme and graphics to have an appeal for students. In addition, the platform can be played by the students at home on any internet-connected device, where the students' progress can be monitored by the teacher anytime.

The scope of this study is centered on playing *Prodigy* as an online educational game-based supplementary material in Grade 7 education, examining and exploring its qualities (content, usability, and technical) through teacher and students' participation. On the other hand, this study is limited to the game component only; thus, an examination of the teacher component of the game is not included (e.g. use of dashboard and planner), including functions such as the "Assignment" and "Standardized Test". Moreover, the school's internet connectivity was not available during the conduct of the study, thus the game testing was conducted at the homes of the respondents.

The study was conducted during the second week to the fourth week of May 2017 at the University of the Philippines Rural High School (UPRHS), Bay, Laguna.

REVIEW OF LITERATURE

Gamification of Education

In relation to gamification of education, there are some studies involving its use. According to Mubaslat (2012), the post-test results in the conducted study "show that games have a good effect on improving the achievement for the primary stage and to create an interactive environment." Higgins, Katsipataki, & Xiao (2012) also noted in their research that integrating technology, used as a

supplementary material in education is effective "rather than as a replacement for it." Moreover, the use of technology and gamification is best used during "short but focused intervention" as stated by Bayraktar (2001) & Moran et al. (2008) cited by Higgins et al. (2012). This brings light to the use of gameducation platforms as supplementary materials in teaching, with lots of advantages in education.

Digital Game-Based Learning on Mathematics

Gamification of education can be applied in the digital interface (computers and mobile devices). Active learning can be promoted through the use of computer games, (Oblinger, 2004 as cited by Katmada et. al. 2014), yielding to more interested students. Csikszentmihalyi (1990) as cited by Katmada et. al. (2014) suggested that the use of such digital games "immerse[s]" players in a state of 'flow', such that students who use digital games truly enjoy playing it and have a sense of involvement as they experience learning. 'Flow' as described by Csikszentmihalyi is "the state in which people are so involved in an activity that nothing else seems to matter."

Alongside the state of 'flow' and increase in student engagement, digital game-based activities promote a positive effect on student achievement and performance. Katmada et. al. (2014) cited various works, including Pareto, Arvemo, Dahl, Haake, & Gulz (2011) and Ke & Grabowski (2007) that reflect the benefits of computer games in education. Pareto et al. (2011), in his novel work, "created a teachable-agent arithmetic game that aims in training basic arithmetics (sic.) skills." With a sample size of 153 students (3rd and 5th grade), the evaluation produced positive results, "that the game helped students improve their math performance and self-efficacy beliefs."

On the other hand, Ke & Grabowski (2007) were interested on the use of adventure games. They studied the effects of such with a sample size of 125 participants (5th grade students), all of which were divided into groups of three: (1) cooperative game playing group; (2) competitive game playing group; and (3) no game playing group. These groups were examined given a duration of four (4) weeks. Their findings showed that the "two game playing groups had better math performance, while the cooperative game playing group had better attitude towards the subject, compared to the other conditions." Katmada et. al. (2014) concluded that games "could actually be successfully incorporated and used by educators as a supplementary tool for the teaching of formal curricular material."

METHODS

Research Design

This paper follows an exploratory research design, which aims to develop insights and understanding on the use of *Prodigy* as an online supplementary material in Grade 7 mathematics.

Participants of the Study

Grade 7 high school students (A.Y. 2016-2017) studying at the University of the Philippines Rural High School (UPRHS) were chosen as participants. There were 3 sections for Grade 7, namely *Dao*, *Ipil*, and *Tindalo*. Each class is composed of at most 40 students. Through draw lots method, the chosen sample was *Tindalo*, with a total of 38 students. Their current Grade 7 Math teacher was also a participant in the study to have a teacher's viewpoint on the program.

Data Gathering Instrument

An evaluation form, modified from the Grand Valley State University Software Evaluation Form, was used for data gathering. It utilized a forced-choice scale model, implying that the respondents have accessed and tried the online educational platform, and thus avoiding any neutrality in the responses (familiarity to the program is present). Moreover, the developed form eliminated any ambiguous option, thus resulting to additional value for decisions on respondents' preferences. The form utilized the scale given below:

1 – respondent expresses a "Strongly Disagree" stand;

2 - respondent expresses a "Disagree" stand;

3 - respondent expresses an "Agree" stand; and

4 - respondent expresses a "Strongly Agree" stand.

The evaluation form was evaluated by two (2) UP NISMED (National Institute for Science and Mathematics Education Development) personnel (Science Education Specialist II and Audiovisual Group Chair, Ma. Lourdes Sales-Agad and Science Education Specialist IV and Senior Lecturer II, Affiliate Faculty of Science Society Program, College of Science, UP Diliman, Rodolfo S. Treyes, Ph.D.). An attention check was added at the "Ability Levels" category to preserve data ("To preserve your answers, please check "2")

Data Analysis

The mode, frequency, and descriptive statistics were used to explain data. The data from the forced-scale evaluation were summarized using the mode and frequency, while the open-ended questions were analyzed using descriptive statistics. These in turn provide an explanation on the perception and effectiveness of *Prodigy* as a supplementary material on the chosen respondents.

RESULTS AND DISCUSSIONS

Given that instructions were distributed to the respondents and that this study was conducted at the expense of the students' homes, Figure 1 shows that more than half of the class size (55%) have registered and evaluated the game while less than half (45%) of the students have not signed-up in the website. The participating 55% of the sample size answered the evaluations forms and their responses were tallied and analyzed based on the modes, frequencies and descriptive statistics. The students' responses were first analyzed, followed by the teacher responses.

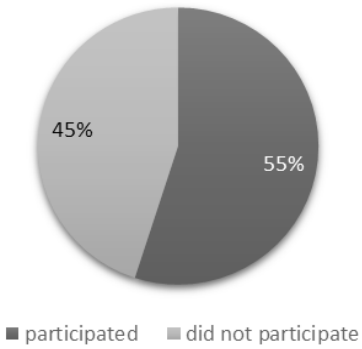


Figure 1. Percentage of student participation and non-participation

The frequency of the students' responses for the evaluation categories enumerated below are summarized Table 1.

In the "Learning" evaluation category, most respondents chose "Strongly Agree". *Prodigy* uses a variety of curricula in its game. In this study, the Common Core State Standards (CCSS) curriculum acted as the study's base curriculum since the Philippine's K-12 curriculum was not available in the choices. As the game

was used, *Prodigy* provided hints and correct answers for students who struggle or obtained a wrong answer in a question for immediate feedback leading to a quick explanation of a certain math concept. To organize student learning, the "Planner" was used to organize specific topics and objectives for each session. This aligned the game to this specific need the teacher wants his or her student to develop, achieving the objectives by presenting the necessary questions for student learning. Overall, the mode for this category is "4" (Strongly Agree), implying a strong positive response in this evaluation category.

Most of the respondents "Strongly Agree" on all criteria for the "Ease of Use" category. The game provided a series of dialogues that aid the user to identify what to do next. This design kept the user in track during the game that avoided confusion regarding a current situation (e.g. in a monster battle). Like any other web application, *Prodigy* can be closed anytime. Once the student disconnects his or her device from the internet or logs-out his or her account, the game saves the current achievement/s the student had. Moreover, the game provided a variety of options to customize their characters to avoid racial bias; in-game chat is strictly filtered to block abusive words (e.g. discrimination, hate speeches). Overall, the mode for this category is "4" (Strongly Agree), implying a strong positive response in this evaluation category.

In the" Ability Levels" category, most of the respondents "Agree" on all criteria. The "teacher" chooses the grade level of his or her students and controls the topic/s in *Prodigy* depending on his or her prerogative on topic planning. However, once the plan has ended, the game will proceed to its diagnostic test (free game) and will continue to identify students' deficiencies and align its questions to address such. Overall, the mode for this category is "3" (Agree), implying a positive response in this evaluation category.

Table 1. Frequency of the students' responses for the evaluation categories

"Learning" Category Criteria	1	2	3	4
1) The content is accurate.	0	1	9	11
2) The content demonstrates factual knowledge.	0	1	7	13
3) The math concept is easily understood.	0	1	11	9
4) The content meets learning goals and objectives.	0	0	9	12
SUBTOTAL	0	3	36	45

"Ease of Use" Category Criteria	1	2	3	4
1) Directions are clear.	0	1	4	15
2) Students can end the program at any time.	0	1	4	16
3) Students can restart the program where they stopped.	0	4	5	12
4) The game is easy to learn – user friendly.	0	0	7	13
5) The game is free of racial bias.	0	0	7	14
SUBTOTAL	0	6	27	70

"Ability Levels" Category Criteria	1	2	3	4
1) The user level can be set by the teacher.	1	1	13	6
2) The software covers a variety of skill levels.	0	1	12	8
SUBTOTAL	1	2	25	14

"Technical Quality" Category Criteria	1	2	3	4
1) Animation and graphics captures students' interest.	1	1	11	8
2) Audio is clear.	0	1	4	16
3) Feedback and prompts are appropriate to the user.	0	2	6	13
4) Student interest is maintained.	0	3	11	7
SUBTOTAL	1	7	32	44

In the "Technical Quality" most of the respondents "Strongly Agree" to the criteria. Aside from the in-game conversations and audio special effects during game battles, *Prodigy* has provided the "Text-to-Speech" audio feature, such that each question can be narrated to the student implying no bias for the various reading levels of students. Aside from animation and graphics and audio, the game contains nine (9) maps to explore, implying an adventure-type quest for the students. This is designed to maintain students' interest of exploring all the nine (9) maps and to achieve the main goal – to finally reach the academy. Overall, the mode for this category is "4" (Strongly Agree), implying a strong positive response in this evaluation category.

In relation to the students' responses, this study also shows how a Grade 7 mathematics teacher views this educational online game-based platform as a supplementary material in Grade 7 mathematics (Table 2). Looking at the frequency of the teacher's responses, most of her choices are "3" (Agree) and "4" (Strongly Agree). Observing both data from the teacher and the students' responses, both opinions are on

Table 2. Frequency of the teacher's responses for all evaluation categories

Category	Question 1	Question 2	Question 3	Question 4	Question 5
Learning	3	3	4	3	n/a
Ease of Use	3	3	3	4	4
Ability Levels	4	✓	4	n/a	n/a
Technical Quality	4	4	4	4	n/a

the same track regarding Prodigy as a supplementary material in improving student learning.

Upon summarizing the tallies and modes, the student respondents have a positive perception in general (Figure 2). This is in relation to the question regarding the use of *Prodigy* for improving student learning as an open-ended question. Most students cite the benefits of *Prodigy*'s good technical quality and its impact on the students, such as the game is "more exciting and visual", where there is the inclusion of "fun activities" while answering the questions. Another said that this lead to an increase in motivation for answering math problems. They show inclined support for video games as it makes learning enjoyable, interesting, appealing, and exciting ("doesn't feel bored").

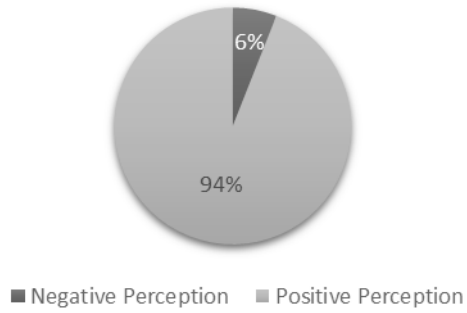


Figure 2. Percentage of the overall perception of student respondents on Prodigy

While the students agree on the benefits of *Prodigy* in student learning, their views on its use as a supplementary material in mathematics vary, as shown in Figure 3. Most students recommend the use of *Prodigy* in their math class with the above reasons stated. While one (1) respondent expressed uncertainty, less than a quarter of the student respondents do not want *Prodigy* to be used in their classes as a supplementary material because "it takes a lot of time" while one argued that the calculator function has been considerably used throughout and "that would not result into learning." Another comment from a respondent is the availability of time in playing the game, such that given time constraints, "It is better to study your books and notes than playing a game."

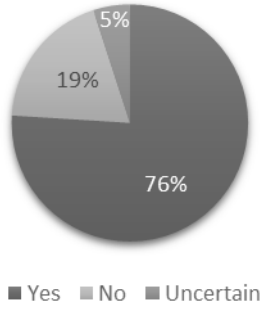


Figure 3. Percentage of the student respondents' choices on Prodigy as a supplementary material in mathematics

Considering the teacher's response to the open-ended questions, she supports the use of *Prodigy* as a supplementary material in mathematics as the use of such "would help the teachers in motivating the students to practice solving or answering math problems." Moreover, she believes that the platform is "fun

and interesting" to students, such that students will enjoy learning mathematics through the help of the platform in terms of fun and interest.

CONCLUSION AND SUGGESTIONS

Data from the evaluations yielded that the overall perceptions of the students on "Learning" (mode of "4" – Strongly Agree), "Ease of Use" (mode of "4" – Strongly Agree), "Ability Levels" (mode of "3" – Agree), and "Technical Quality" (mode of "4" – Strongly Agree) inclined to be positive. In relation to the students' responses, the teacher's responses have most of her choices as "3" (Agree) and "4" (Strongly Agree). Observing both data from the teacher and the students' responses, both opinions are on the same track regarding *Prodigy* as a supplementary material in improving student learning; thus, there is a positive perception towards the game. Overall, based on the teacher and students' responses, *Prodigy* is recommended as a supplementary material in mathematics, yet less than a quarter of the students do not due to time elements and the use of the in-game digital calculator.

Given that the study was conducted at the students' home, it is recommended that the conduct of the study be made in the school premises, especially in the computer laboratory where there is internet connectivity; this avoids non-participation of students. Allotting multiple meetings may be applied in this set-up. Aside from this, other grade levels may be chosen as the sample size of this study. Other online games related to mathematics may be studied using the same type of questionnaire in this study.

ACKNOWLEDGEMENT

The author would like to acknowledge the UPRHS faculty and students, specifically Grade 7 - *Tindalo* and their adviser for permitting the author to conduct this study.

REFERENCE

Caponetto, I., Earp, J., & Ott, M. (2014). Gamification and education: A literature review. In *European Conference on Games Based Learning* (Vol. 1, p. 50). Academic Conferences and Publishing International Limited, London (Regno Unito). ISBN: 978-1-910309-55-1.

Chen, P. D., Gonyea, R., & Kuh, G. (2008). Learning at a Distance: Engaged or Not? *Innovate: Journal of Online Education*, 4(3).

Courville, K. (2011). Technology and its use in Education: Present Roles and Future Prospects. Online Submission.

Glover, I. (2013). Play as You Learn: Gamification as a Technique for Motivating Learners. In J. Herrington, A. Couros & V. Irvine (Eds.), *Proceedings of EdMedia: World Conference on Educational Media and Technology 2013* (pp. 1999-2008). Association for the Advancement of Computing in Education (AACE).

Higgins, S., Katsipataki, M., & Xiao, Z. (2012). The impact of digital technology on learning: A summary for the education endowment foundation. Durham, UK: Education Endowment Foundation and Durham University.

Jackson, M. (n.d.). *Gamification in Education: A Literature Review*.

Katmada, A., Mavridis, A., & Tsiatsos, T. (2014). Implementing a game for Supporting Learning in Mathematics." *The Electronic Journal of e-Learning*, 12(3).

Kuh, G. D. (2009). The national survey of student engagement: Conceptual and empirical foundations. *New Directions for Institutional Research*, 2009(141).

McCray, K. (2007). Constructivist Approach: Improving Social Studies Skills Academic Achievement. Master's Dissertation; Marygrove College.

Mubaslat, M. M. (2012). The Effect of Using Educational Games on the Students' Achievement in English Language for the Primary Stage. Online Submission.

Newmann, F. M. (1991). Student engagement in academic work: Expanding the perspective on secondary school effectiveness. In J. R. Bliss, W. A. Firestone, & C. E. Richards (Eds.), *Rethinking effective schools: Research and practice*. Englewood Cliffs, NJ: Prentice-Hall.

"Prodigy." (2016). Retrieved from: https://prodigygame.com

Group-based Game Making for Descriptive Writing

Andreas Setiawan

ABSTRACT

In this modern era, one of the most interesting inventions in the field of entertainment is games. Not only could games relieve our stress from daily routines, boredom, etc., but they could also be used as a medium for learning. The purpose of this study is to discover the Faculty of Language and Arts students' perceptions on the group-based game making to learn descriptive writing and the students' perception of game-making benefits for learning descriptive writing. The data were taken from 24 freshmen in batch 2016 of the Faculty of Language and Arts, Soegijapranata Catholic University. For data collection, the writer used a close-ended, Likert Scale questionnaire with four arranged options. The analysis method used in this study is quantitative method which uses a simple descriptive statistics analysis. The results of the study showed that the students' perceptions on the group-based game making to learn descriptive writing and the students' perception of game-making's benefit for learning descriptive writing is positive. Students found that games were useful and helpful to be applied for descriptive writing practice as it gave them various supportive multimedia aids such as visual illustration, audio support, content editor, etc. and group-based game making activity also enhances their communication, peer solidarity, and language skills.

INTRODUCTION

In recent years, technology has been making a major breakthrough in people's lives. It has been improving people's lives by making things easier and advanced in the fields of communication, information, transportation, healthcare, and also entertainment. One of the most interesting breakthroughs in the entertainment field is the invention of game. According to Salen & Zimmerman (2004), game is "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome" (p. 80).

The purposes of the invention of games are to give the users/players an entertainment that they could actively engage in order to release the stress from their routines or boredom, for leisure, and also for educational or learning purpose.

One of the methods of using games for learning purpose is through the activity of game making, especially in groups (working collaboratively). Group-based game making (or collaborative game-making) provides a learning model where students or learners can work together to create something meaningful for them, which could also facilitate the development of a range of 21st Century Skills (21CS) such as critical thinking, computer literacy, problem solving, etc. (Bermingham, et al., 2013). Furthermore, designing and developing games could address the needs that the learners require better than simply playing the already-existed games (Brennan & Resnick, 2012; Robertson, 2012).

Existing literature on the role of games used for learning has shown some significant impacts for the learners. According to Dempsey *et al*. (1994), games serve many functions such as tutoring, amusing, helping to explore new skills, promoting self-esteem, practicing skills, or seeking to change attitudes. In addition, simple types of games genre such as adventure, arcade, board, simulations, puzzle and word games could be constructed to achieve specific learning outcomes such as decision making and problem solving (Dempsey, Lucassen, Haynes, & Casey, 1996), and help promote computer literacy skills (Natale, 2002). Blake & Goodman (1999) have also found that using games as a learning medium could motivate the students' preparation for class and help them become acquainted with their classmates that they have not worked with before. Therefore, games could also be used to facilitate students to learn collaboratively with their peers.

According to Lehtinen *et al*. (1999), collaborative or group learning refers to an instructional method where students are encouraged to cooperate on learning tasks. It means that the fulfillment of tasks and problem solving requires group

of learners' mutual effort, involving communications and interactions between them. Therefore, collaborative learning supports the idea that learning is a social activity in which knowledge-seeking inquiry is fulfilled through combined efforts of the inquirers.

The reason why the writer conducted this research on group-based game making to learn descriptive writing is due to the fact that the writer wanted to find out the potential of the use of game to enhance the learning process and skill such as descriptive writing skill. The writer would also like to know if games could be designed and used for learning purpose to achieve a specific learning outcome. Even though there is some research on the utilization of game for learning in other countries, such literature is still lacking in Indonesia, and that is why the writer decided to contribute one to it. In this research, the writer formulated a problem related to the students in the Faculty of Language and Arts: What are students' perceptions on group-based game making to learn descriptive writing?

REVIEW OF LITERATURE

GAME

Before we discuss any further, it is important to know what a game is actually for the purpose of this review. Dempsey *et al*. (1996) defined game as:

> A set of activities involving one or more players. It has goals, constraints, payoffs, and consequences. A game is rule-guided and artificial in some respects. Finally, a game involves some aspect of competition, even if that competition is with oneself. (p. 3)

It might be best if we treat game like our parts of the body, each of which has different designs, purposes, gameplays—competitive, cooperative, or individualistic (The British Educational Communications and Technology Agency [BECTA], 2001, p. 1) and target audiences, giving a broad range of options for players to experience and enjoy. To put it simple, game has many varieties of categories. According to Herz (1997), there are some major game categories, as follows:

1. Action games – a type of games where players' reaction plays a major role in completing the games such as shooting games, platform games (where the players need to move their character from one platform to another in the game in order to survive, for example), and other reaction-based games.

2. Adventure games – a game where players need to fulfill some tasks or quests in a virtual, in-game world in order to proceed to the final stage/ finish the game. Examples of them are Assassin's Creed, God of War, etc.

3. Fighting games – a kind of game where players fight (mostly using martial arts) computer-controlled enemies or player-controlled ones. The objective of this game category is to defeat your opponent and become the winner, just like in a real fighting competition. Examples of this type are Tekken series, Mortal Kombat series, Ultimate Fighting Championship (UFC), and other fighting-based ones.

4. Puzzle games – a kind of game where player(s) complete certain types of puzzle. Some examples of this type of game are Tetris and Candy Crush Saga

5. Role-playing games – in this game, players assume a role of a character, mostly in fantasy or science fiction settings and able to interact within it. The Elder Scrolls series, Final Fantasy series, Borderlands series are some of the popular examples.

6. Simulations – a category where players play simulated, (mostly) real-life activities in order to succeed. Some of the examples are The Sims, Theme Hospital, and Euro Truck Simulator series.

7. Sports games – a type of game where players play a simulated sport activities. Some game titles that belong to this category are NBA, Pro Evolution Soccer, and Madden NFL.

8. Strategy games – a game type where players have to do strategical gameplay such as commanding a group of heroes or armies in a fight and managing in-game resources. Age of Empires, Civilization, and Kessen series are good examples.

Like Herz (1997), Griffiths (1997, 1999) also divided games into more or less similar categories, but he mentioned that only two categories from the list, which are puzzlers (puzzle) and weird games (games that do not fit another categories), contain educational capabilities. He also suggested that the aforementioned categories could be implemented in schools so that it might "foster learning and overcome some of the negative stereotypes that many people have about computer games."

In their research findings, Blake & Goodman (1999) found that using simple

types of games such as Wheel of Fortune and Tic-tac-toe for nursing school students improves their motivation for class, social life (have a chance to know their non-familiar peers), and scores greatly. The positive results are also related to the students themselves. Wheel of Fortune and Tic-tac-toe were chosen because the majority of the students are familiar with both types of games, as it is also popular. Also, Blake & Goodman (1999) did a very good job in utilizing the games for learning. They shaped both kinds of games in a way that the learning content could be optimized and delivered smoothly to the students to achieve the desired learning outcome (Dempsey, Lucassen, Haynes, & Casey, 1996). The students' increased preparation for class has also improved the teaching process. Teachers are able to cover more contents and use less time to deliver the materials; thus making the subject delivery more efficient.

THE USE OF GAMES FOR LANGUAGE LEARNING

Although it may seem to be contradictory in a sense, games could also be used to foster language learning. According to Gee (2003), in this digital and modern era, language itself is and has always been a mixture of sound, words, images created in the mind, and gestures used in contexts full of objects, sounds, actions, and interactions. Game is not only about playing and enjoyment, but there is more to it. Games also have objectives and story contents inside them which are mostly represented in texts. The difference is, however, the game developers offer a more creative approach in delivering them than a book/writing does. The approach always situates ("shows") the meanings of the words and demonstrate how they vary across different actions, images and dialogues. They do not offer just words for words ("definitions") like a dictionary does. Game almost always gives verbal information in the right time—when players need and can use it—or when the players request it. Game has its own unique 'language' for the players. It is presented by a mixture of texts and modern audiovisual technologies, resulting in a good description.

Gee (2003) stated that a well-designed game can leverage deeper and deeper learning, and in this context is language learning. Ang & Zaphiris (2006) also stated that the contexts that games and simulations provide offer (the player) great opportunities to use (learn) the target language.

COLLABORATIVE LEARNING

According to Dillenbourg (1999), collaborative learning is "a situation in which two or more people learn or attempt to learn something together" (p. 1). Collaborative learning is a learning method that emphasizes social interactions among the members of the group to gain or learn knowledge through mutual sharing from their different thinking perspectives. There are several benefits of collaborative learning. It helps promote students' critical thinking skills, engages students to involve actively in the learning process, improves students' classroom performance and results, and also fosters their problem solving techniques (Roberts, 2005). In collaborative learning, the participants or group members are more or less on the same level (of knowledge), but there are no individuals in this world that possess the same knowledge from one to another (Dillenbourg, 1999). Therefore, the best way to utilize collaborative learning is to learn new things that we haven't known before through the group's interaction so that one may learn from each other's knowledge and expertise (Gokhale, 1995).

COLLABORATIVE GAME-MAKING

According to Bermingham et al. (2013), collaborative game-making provides a model in which learners can work together to create something meaningful for them, facilitating the development of a range of 21st Century Skills (21CS) such as critical thinking, computer literacy, problem solving, etc. Kafai (2006) also elaborated that the pedagogic idea of learning by making games could be presumed that the construction of games provides learners to reformulate their subject understandings and helps to express their personal ideas and feelings about the games' subject and the games constructed, both respectively. Designing games enhances students' sense of classroom community, which motivates them to ask questions and provide their help for others (Baytak & Land, 2010) as well as sharing their thoughts such as tips and alternative methods of problem solving in the game-making environment (Robertson & Nicholson, 2007). In addition, the needs of the learners could better be addressed by designing and developing games than simply playing the games which have already existed (Brennan & Resnick, 2012; Robertson, 2012). Cheng (2009) has also proven that learning motivation, problem solving ability, and creativity in an interactive multimedia course of the students could be facilitated by his *Game Making Pedagogy* (GMP) model. the research findings also indicate that students were satisfied with making their own games due to the strong sense of ownership and benefited from inter-group and intra-group interactions. Furthermore, in his research, Earp (2015) stated

that game-making occupies the position in between game-based and technology-enhanced learning, and focuses more on active, learner-driven methods in education. In his research findings, game-making by the learners also fosters their digital technology familiarity and confidence in the classroom. The activity also encompasses several important skills like collaboration, creativity, and thinking skills. Sanjaya, Murniati, & Blair (2016) has also shown the usefulness of game-making activity to learn collaboratively in their research. Thus, collaborative game-making activities provide students meaningful opportunities to become better communicators, problem-solvers, and support the development of various skills such as reading, writing, speaking. It also encourages them to use and familiarize themselves with digital & visual communication aids.

DESCRIPTIVE WRITING

Hollingsworth (1988) defined descriptive writing as "...giving dimensions, colors, surroundings, origins, placement, and other information to help readers get a mental picture of an object, person, or idea, and how it operates." In general, descriptive writing provides illustrations of several subjects such as people, places, events, situations, thoughts, and feelings. It also presents sensory information which makes the writing more vivid. Also, descriptive writing could express an experience that readers can actively participate in by using imagination. Details in descriptive writing (or descriptive details) greatly support the development of the overall dominant impression. The dominant impression is an idea or theme which the writer wants to express from the complexity of the story's construction. An activity, snowboarding for example, can be described as exciting or scary depending on words which are carefully chosen, or from a subtly crafted mood. Mostly, a thesaurus offers a great help to achieve this. It has lists of variety of words with similar meanings or connotations. Descriptive details enable readers to visualize several elements contained in the story. Vivid adjectives and active verbs will significantly boost the writer's ability to develop specific descriptions of the aforementioned sensors.

Descriptive writing provides literary texture to a story. Texture is more into 'showing' rather than 'telling'. The writer shows the reader through different kind of senses such as sight, hearing, smell, taste, and touch, as well as through emotional feelings. Below here are the examples of a sentence which tells and a sentence which shows:

- The woman on the beach watched the sun set over the ocean. (tells)

- The liquid began to evaporate slowly due to its exposure to the heat (tells)
- The old, Victorian-style painting of a seasoned war veteran which rests in the main hall of the building threw me an eerie, intense stare as I slowly tiptoed my way through the blood-stained mahogany door. (shows)
- Shades of neon illuminated the edges of clouds, backlit by the sizzling sun that slipped beneath a cerulean sea. (shows)

From the examples above, sentences that tell tend to be direct because they are objective. Sentences that tell record verifiable facts as a scientist or journalist might. On the other hand, sentences that show are subjective; they may be influenced by the writer's personal experiences. Sentences that show create mental images and elicit emotional response for the readers.

In conclusion, descriptive writing enables students to write better and teach several benefits such as: 1) organizing their thinking or idea, 2) searching for and communicating details, 3) defining people, places and things, and 4) writing with clarity and purpose. (Schacter)

RESEARCH METHODOLOGY

METHOD OF DATA COLLECTION

Participants

The participants of this research were the freshman of the Faculty of Language and Arts. The population of the participants is 65 students. The writer recruited all of them to the workshop but there were only 24 students who were voluntarily willing to come. The reason why the writer chose the participants was because the students just started to learn and practice descriptive writing in English writing class.

Instrument

In collecting the data needed for the research, the writer used instrument to achieve the research's goals. The instrument to collect the data in this study are questionnaire. Questionnaire is a series of questions which are utilized to collect data or information needed from the respondents involved (Creswell, 2009). The writer used the questionnaire from Murniati & Sanjaya's study (2015) that was

modified slightly in order to match it with the purpose of this research and a game-creator software called RPG Maker MV.

The questionnaire was about the students' perceptions on group-based game making to learn descriptive writing. According to Cohen, Manion & Morrison (2007), there are two kinds of questionnaire:

1. Close-ended questionnaire: prescribe the range of responses from which the respondent/participants may select.

2. Open-ended questionnaire: could be used if there is an excessive amount of possible categories which a close-ended questionnaire would contain an extremely long list of response options.

The questionnaire that the writer used for this research was close-ended questionnaire and it consisted of seven background questions and 18 statements. Four response options are provided in the questionnaire, ranging from:

- **4 (***Strongly Agree***)**
- **3 (***Agree***)**
- **2 (***Disagree***), and**
- **1 (***Strongly Disagree***)**

The questionnaire used was already in English because the participants of this research were the students of the Faculty of Language and Arts so the writer saw it unnecessary to transcribe it.

The game-creator software, RPG Maker, is a program that enables its users to create their own RPG (role-playing video games). Most of it has a tile set based map editor, a simple scripting language for scripting events/dialogue, and a battle editor included. All RPG Maker releases have initial premade tilesets, characters, and events that can be utilized in creating new games. Also, for the PC version, users could add new tilesets and characters, including new graphics, should they want to. RPG Maker MV is the latest series of RPG Maker programs. It has been greatly improved from the earlier releases, and it has multi-OS support, side-view battles and high resolution support. RPG Maker MV is the first engine in the series to use Javascript with plugin additions. Also, completely created games can be played on a mobile device.

Research Procedure

In this section, the writer would like to elaborate the procedure of this research.

1. Firstly, the writer modified the questionnaires from Murniati & Sanjaya's study (2015), entitled *The Integration of Games for Collaborative Learning*. The writer edited and deleted some parts of the question in order to meet the writer's need for this research's results. For example, the writer changed the addition of 'descriptive writing subject' emphasis in some of the questions. One example of it is the question '*Do you agree that a game meets your needs for learning a subject?*' is edited into '*Do you agree that a game meets your needs for learning descriptive writing skill?*'
2. Secondly, the writer did a pilot study to check the validity of the questionnaire. The pilot study was done by six students who are not from 2016 batch. Based on the six participants' responses, the statements of the questionnaire were clear enough and no confusing statements were found. Therefore, it can be concluded that all statements of the questionnaire are valid.
3. Third, the writer asked for permission from the lecturer(s) of the Faculty of Language and Arts for conducting the workshop.
4. The writer met and informed the students a day prior to the workshop and explained briefly what this research and workshop were about, also the preparations needed for the workshop (laptop/ computers).
5. Next, on the workshop day, the writer divided the students into a group of three and gave the students an hour to brainstorm their story ideas. After that, the writer guided them in creating and editing the game step-by-step until they were finished with their work.
6. Then, the writer distributed the questionnaires to the students who had finished their work. The writer also assisted them in filling the questionnaires to make sure that there would be no misunderstanding in filling it.
7. Next, the writer analyzed the data from the questionnaires to find out about the results. The writer analyzed the data quantitatively by using SPSS to calculate the data.
8. Lastly, the writer interpreted the questionnaire results to acquire the final, conclusive data.

METHOD OF DATA ANALYSIS

The questionnaires were given to the students in class after the workshop was done. The workshop for this research was conducted at Henricus Constant (HC) B.1.3 classroom of the Faculty of Language and Arts. The participants of this research were 65 students of 2016 batch of the Faculty of Language and Arts but only 24 students were present for the workshop. For the workshop, the writer informed the students to bring laptops before the workshop day for installing RPG Maker MV, which was the game used for this research. During the workshop, the writer first explained the students what descriptive writing is about. Then, he asked the students to brainstorm their question ideas for their game for one hour. Next, the writer guided the students during the game installation process, followed by content editing, what should be added, how much questions, what topic and so on. Last was the finalization of the game. The writer asked the students to entitle and test their created game and also their peers', followed by questionnaire filling.

After the students finished filling in the questionnaires, the writer analyzed their answers based on Likert scale for the statements quantitatively by using SPSS. According to Babbie (2007, p. 171), Likert scale is a type of composite measure developed by Rensis Likert in an attempt to improve the levels of measurement in social research through the use of standardized response categories in survey questionnaire. There are four response options provided, ranging from 4 (*Strongly Agree*), 3 (*Agree*), 2 (*Disagree*) and 1 (*Strongly Disagree*) where 4 (*Strongly Agree*) is the most favorable answer and 1 (*Strongly* Disagree) is the least favorable answer.

DATA ANALYSIS AND INTERPRETATION

In this chapter, the writer would like to discuss the findings and interpretation of the data related to the students' perceptions on group-based game-making to learn descriptive writing. The writer analyzed the data based on the related theories and previous researches that have been done. The writer also obtained the data from the freshman. The students had taken paragraph and expository writing class, had knowledge about descriptive writing in general. The students who participated in the workshop were only 24 out of 65 of the total population, with the total gender combination of 4 male students and 20 female students. In this chapter, the writer described the findings in two sections; the first half consisted of each of the background questions, and the second half is the 18 statements that were found in the related questionnaire. They are as the following:

BACKGROUND QUESTIONS

Table 1. Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Female	20	83.3	83.3	83.3
Male	4	16.7	16.7	100.0
Total	24	100.0	100.0	

As the writer have stated above, a total of 24 students were the participants of the workshop/research conducted. The participating male students were four persons only, where the female students were the majority of the participants, taking as much as 83.3% of the total amount (20 students).

Table 2. Playing frequency

	Frequency	Percent	Valid Percent	Cumulative Percent
Very Often	4	16.7	16.7	16.7
Often	7	29.2	29.2	45.8
Sometimes	7	29.2	29.2	75.0
Seldom	6	25.0	25.0	100.0
Total	24	100.0	100.0	

The second item of the background question was the frequency of the students' playtime. Four of the students said they played games very often. Seven of them played games often too, but not as frequently as the first four students. The rest were casual gamers as there were 29.2% (seven) students that played games sometimes, and the last six students, which took 25% of the total, rarely or seldom played games. The result indicates that the gaming frequency of the students vary from one another depending on their preference of using their leisure time.

Table 3. Platform used for gaming

	Frequency	Percent	Valid Percent	Cumulative Percent
On my laptop	8	33.3	33.3	33.3
On my smartphone	15	62.5	62.5	95.8
On my console	1	4.2	4.2	100.0
Total	24	100.0	100.0	

The next item was about the gaming platform that the students tended to use. The majority of the population (62.5%) played their game on their smartphone, while the rest of the students played it on their laptops and gaming consoles, summing as much as 33.3% (eight persons) for the former and 4.2% (one person) for the latter. Rather than the usual gaming platforms such as computers/laptops and consoles (PlayStation, Xbox, etc.), this result shows that most students preferred a platform that is compact, easy to carry, and able to access at any time, which is smartphone.

Table 4. Gaming skill

	Frequency	Percent	Valid Percent	Cumulative Percent
Very Good	2	8.3	8.3	8.3
Good	19	79.2	79.2	87.5
Fair	2	8.3	8.3	95.8
Poor	1	4.2	4.2	100.0
Total	24	100.0	100.0	

The fourth background question asked about the students' confidence in rating their game-playing ability. 19 students were confident that their game-playing ability was good, whereas two students proudly stated that they had a very good game-playing ability than the rest. 8.3% of them felt that their game-playing ability was fair. Interestingly, one student, or 4.2% of the total population, acknowledged that his/her game-playing ability was poor. Based on the result, the majority of the student felt that they had a good skill in gaming which could be indicated that the students were familiar enough with the games that they played.

Table 5. Game type

No	Game Type	Total
1	Real-time strategy	8
2	Simulation	12
3	Role-playing game	8
4	Puzzle	8
5	Massive multiplayer online	2

The fifth from the background questions was about some type of games that students liked to play. The writer provided some options and the students were free to choose for more than one option, should they want to. From the table above, the most favorable game type that the students liked the most was simulation games whereas the second most popular ones belonged to real-time strategy, role-playing game (RPG), and puzzle, favored by eight students each. The least favored type was massive multiplayer online (MMO) which was chosen by two students only.

Table 6. Numbers of players

	Frequency	Percent	Valid Percent	Cumulative Percent
Multiplayer	6	25.0	25.0	25.0
Single player	18	75.0	75.0	100.0
Total	24	100.0	100.0	

Background question number six was about the students' preference of players in playing games. From 24 students, 25% (six) of them liked to play the game with their friends/family members/colleagues (multi-player) whereas the majority 75% (18) for this category preferred to play it individually (single-player). The result of this question shows that students liked to play their games by themselves due to accessibility and availability. Playing a single player game is quicker rather than multi player because students did not have to wait or even need another players.

Table 7. Creating game

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	3	12.5	12.5	12.5
No	21	87.5	87.5	100.0
Total	24	100.0	100.0	

The last background question was about the students' experience in creating a game. In this simple question, students were asked whether or not they have created a game before. Three of them answered with 'yes' whereas the remaining 21 answered with 'no'. While students' inexperience in creating a game are high, this is understandable because the students are from the Faculty of Language and Arts whose focus is studying English instead of game making.

STATEMENTS

From the table (see table 8 on appendix A and table 9 on appendix B), we can see that the overall mean score of the students' perceptions on group-based game making to learn descriptive writing could be concluded as favorable. Also, there are two statements that have the highest mean scores of all (3.42), respectively Statement 4 (*This game is helpful for me to practice descriptive writing*) and Statement 14 (*Games should be included as a learning medium in schools/colleges*). The mean for Statement 4 indicates that the usage of the game helps the students describe their writing practice. The writer also observed during the workshop that each character and setting could be developed differently into a various form of descriptive details/questions from one group to another in a short time. The majority of the students felt this game, or the usage of this particular game during the workshop, are more helpful than the standard writing activity (without any multimedia aids). The other one of the highest-scored statements, which is Statement 14 (*Games should be included as a learning medium in schools/colleges*), shows that the inclusion of a modern learning medium, which in this case, game, is very preferred by the students in a school/college setting.

The second high-scored statement (3.38) goes to Statement 13 (*It is possible to use the game to practice other English skills and contents [e.g. reading, sociolinguistics, culture]).* Based on the favorable response, the students felt that the game holds many possibilities to be applied in other English skill courses and contents. Meaning, the game's academic application is not limited to writing practice purposes only, but also to other English-related courses such as structure,

reading, and literature if it is programmed in such way.

The statements that highlight the relevance of group-based game making for this study are Statement 8 (*I am interested in creating group-based games to practice my descriptive writing skill*), Statement 11 (*I feel that group-based games are more appealing if they can be played on various gadgets*), Statement 15 (*We distribute the writing tasks equally*), and Statement 16 (*The team members shared their ideas in creating the writing activities*). The aforementioned statement each have the following means of 3.00, 3.25, 3.08, and 3.29, resulting to an average mean of **3.155**. This data show that the students have perceived a good attitude towards group-based game-making activity. Students feel that it is a good activity for they could enhance their writing skill (in this case, descriptive), and contribute something to the group such as ideas which are very relevant to what Robertson & Nicholson (2007) had stated (sharing ideas & tips). They also take turns in writing the descriptive questions/statements so that everyone is involved in the process. The students also thought that the group-based games that they created would be more interesting if it could be executed on various gadgets/platforms so that everyone could enjoy it without any technological hindrance or limitations.

The next list of statements highlights the students' thought of the game's usage for practicing descriptive writing. Statement 4 (*This game is helpful for me to practice descriptive writing*), 6 (*Creating a game to practice descriptive writing is exciting*), and 7 (*I feel this game meets my needs to learn descriptive writing skill*) are covering this section. The average mean of the aforementioned statements for this section is **3.333**. The average mean scores for this category has proven that game's usage plays a quite major part in boosting the students' descriptive writing practice through the game aids as it is deemed helpful, exciting, and fulfilling by the students. As for the game application for another writing genre stated by Statement 5 (*I am interested in creating a game for different writing genres*), the students also showed a positive attitude towards the activity.

The statements that show the students' personal thought of the game-making activity and the game itself are Statement 1 (*I feel satisfied with the game I created*), 3 (*The template is helpful for me to create the activities*), 9 (*I am interested in sharing the game I created*), 10 (*The game I created is useful for other learners who want to practice their English skills*), 12 (*I feel that the game I created is interesting*), and 18 (*It is better to create this kind of game on my own*). Favorable responses are given from the students to Statement 1 (3.13), 3 (3.29), 9 (3.00), 10 (3.21), 12 (3.17). We can see that after the activity was

done, the students were satisfied with their created game. They also felt that the game was helpful for them in creating the activities, meaning that the game has provided a smooth support for the students. Interesting aspects that we could deduct from their answers are their opinions on the game. They believe that it is interesting and helpful for other learners to improve their English skills, and they don't even mind sharing it with others also, should they need one. As for Statement 18 (*It is better to create this kind of game on my own*), the students felt that the provided game template will be easier to manage individually. This could be caused by the availability of the laptops per group, which is only one. Although they took part and took turns in sharing their ideas (Statement 16) and typing the contents (Statement 15), the wait between turns could cause a boredom, which is believed why they would like to do it fully on their own.

The remaining statements, Statement 2 (*Creating the game is easy for me*) and Statement 17 (*Creating the writing activities is more difficult than creating the game itself*), received mean scores of 2.42 and 2.92 respectively. The students found that making the game is not easy as they thought it would be as there are many things that should be managed and programmed. The writer also found it a bit overwhelming at first, but with a bit of practice and familiarity with the game itself, everything will be easier and fun after a while. The writer believed that the cause was from the students' unfamiliarity for they tended to ask the writer for a help in optimizing their game's content. As for Statement 17, students found it quite challenging in making the descriptive writing activity. Before the workshop began, students were asked by the writer whether they had reached descriptive writing in their writing class or not, and the students answered that they had just started on the particular topic but had not practiced much. From their answers, the writer believed that the cause was the students' unfamiliarity with the descriptive writing itself.

In general, the findings of this study related to the students' perceptions on group-based game making to learn descriptive writing could be indicated as favorable. The students felt that the game and the game-making activity are both interesting and helpful. The idea of working in groups received a positive response as well. Students were able to contribute to and share something with the group to maximize their work. The game is also perceived to be helpful for learning descriptive writing as well, as it contains many interesting functions and features inside to support the learning process despite having some drawbacks, such as the students' familiarity with the game and their knowledge about descriptive writing.

CONCLUSION & SUGGESTION

Based on the analysis on the previous chapter, the writer found out that in general, the students' perception on group-based game making to learn descriptive writing have received a favorable response. Group-based game making has been considered as a fun activity by the students as it fosters the enhancement of their peer solidarity and also communication and language skills (see results of statement 15 and 16 on appendix B). The activity stimulated the students to share their knowledge and tips with their groupmates on how the game and the writing should be constructed to be as good as possible. During the workshop, the students were actively discussing the questions that they should be using for their game and asked for their peers' recommendation and ideas. They also asked their groupmates whether or not their grammar on the questions was wrong, hoping for a correction from their mates who had a better understanding and knowledge about it so that the best result could be presented to other groups at the end of the activity. Another positive aspect from the activity is that the students who have a better knowledge at English could directly (or even indirectly) teach his/her friends who haven't yet understood, which potentially leveraged the language learning process.

The students have also grown a positive attitude towards the game and the activity involving the usage of games. The students felt a sense of satisfaction upon completing the creation their game due to several aspects of the game itself (see statement 1 on appendix B). Students felt that the game was very helpful for them in the terms of learning purpose as it provided them a multiple support (see statement 3 on appendix B). Games give them visual, textual, and audio aids which could help stimulate the students' ideas and imagination on themes, characters, stories, questions, etc. that they would like to create. As the game's default language is also English, it could also enhance their English skill indirectly. The students would also like to share the game template and their created game with others due to its positive factors and usefulness (see statement 9 and 10 on appendix B). Interestingly, the students showed a very positive response to the idea of applying the usage of game for learning in school/university setting (see statement 14 on appendix B). The main reason was that students felt that using game as a learning medium was more fun and interesting due to the aforementioned positive factors than the conventional learning method.

Third, the game has also been perceived as a helpful medium by the students in aiding them to practice descriptive writing. The game has provided more than

enough support such as visual, textual, and audio aids which have been stated above for them to work on. In summary, students find it helpful, exciting, and fulfilling as it meets their needs for practicing descriptive writing which has been proved by Statement 4 (*This game is helpful for me to practice descriptive writing*) for being the most highest-scored statement of all.

There were also some aspects in the study that hamper the students' progress. The first one was the students' knowledge about the game. They are less familiar with the game that sometimes it could slow their progress down (see statement 2 on appendix B). This was understandable in the writer's perspective as they were not from game technology major. The second aspect was the students' knowledge of the descriptive writing itself. The students did not learn the subject well enough that they had trouble at arranging and making the descriptions of the questions at some occasions. However, the problems above were not major and with a bit of practice and familiarity on the matters above, the writer believes that the hindrances could be negated completely.

The result of this study is also similarly related to Murniati & Sanjaya's study (2015), where students also encountered some technical encounters related to the students' familiarity with the game, but there was nothing major and did not diminish the study's findings that students felt the game was interesting and also useful to learn a subject matter, which is English.

With regard to the conclusions above, the writer would like to incorporate some suggestions for further study about the implementation of game-making in groups for learning English writing skill, which is descriptive writing in this case. Firstly, the study was limited in several ways. There was a low number of participants, which is 24, and this study only used a simple descriptive statistics so it could not be generalized to other populations. Also, the writer suggests an extensive research about the full capabilities and features of RPG Maker MV or other game templates that could be used for English skill learning purposes, mainly writing skills. For future research, it would be preferable to find out more about the participants' English language & writing skills first so that the game could be constructed to be more suitable to the research's purposes. Last but not least, the writer also hope that this study could be used as a reference by the lecturers or teachers to improve their language teaching using a game as the learning medium, so that students could enjoy and learn English in a fun, modern, and beneficial method.

BIBLIOGRAPHY

Ang, C. S., & Zaphiris, P. (2006). Developing enjoyable second language learning software tools: A computer game paradigm. London, United Kingdom: Information Science Publishing. Retrieved from http://webftp.nkut.edu.tw/~084210/Video%20Games%20---Articles/Game_palying_and_language_learning.pdf

Babbie, E. R. (2007). The practice of social research (11th ed.). Thomson Wadsworth.

Baytak, A., & Land, S. M. (2010). A case study of educational game design by kids and for kids. Procedia-Social and Behavioral Sciences, 2(2), 5242-5246. Retrieved from http://www.sciencedirect.com/science/article/pii/S1877042810008931

BECTA. (2001). Computer games in education project. Retrieved from http://www. becta.org.uk

Bermingham, S., Charlier, N., Dagnino, F., Duggan, J., Earp, J., Kiili, K., . . . Whitton, N. (2013). Approaches to collaborative game-making for fostering 21st century skills. 7th European Conference on Game Based Learning, 1, pp. 45-52. Retrieved from http://www.cnr.it/istituti/Allegato_71525.pdf

Blake, J., & Goodman, J. (1999, March/April). Computer-based learning: Games as an instructional strategy. ABNF Journal, 43. Retrieved from http://www.savie.ca/SAGE/Articles/1111_1132_Blake_1999.pdf

Bermingham, S., Charlier, N., Dagnino, F., Duggan, J., Earp, J., Kiili, K., . . . Whitton, N. (2013). Approaches to collaborative game-making for fostering 21st century skills. 7th European Conference on Game Based Learning, 1, pp. 45-52. Retrieved from Http://www.cnr.it/istituti/Allegato_71525.pdf

Cheng, G. (2009). Using game making pedagogy to facilitate student learning of interactive multimedia. Australasian Journal of Education Technology, 25(2), 204-220. Retrieved from https://ajet.org.au/index.php/AJET/article/viewFile/1150/398

Cohen, L. L., Manion, & Morrison, K. (2007). Reserach Methods in Education. London and New York: Routledge. Retrieved from https://dspace.utamu.ac.ug/bitstream/123456789/182/1/Research-Methods-in-Education-sixth-edi-

tion.pdf

Creswell, J. C. (2009). Research Design, Qualitative, Quantitative, and Mixed Method Approaches. Lincoln: Sage Publications University of Nebraska. Retrieved from http://www.ceil-conicet.gov.ar/wp-content/uploads/2015/10/Creswell-Cap-10.pdf

Dempsey, J. V., Lucassen, B. A., Haynes, L. L., & Casey, M. S. (1996, April 8-12). Instructional Applications of Computer Games. Annual Meeting of the American Educational Research Association , 8. Retrieved from http://files.eric.ed.gov/fulltext/ED394500.pdf

Dempsey, J. V., Rasmussen, K., & Lucassen, B. (1994, February 16-20). Instructional Gaming: Implications for Instructional Technology. the Annual Meeting of the Association for Educational Communications and Technology, 3. Retrieved from http://files.eric.ed.gov/fulltext/ED368345.pdf

Dillenbourg, P. (1999). What do you mean by 'collaborative learning'? Collaborative Learning: Cognitive and Computational Approaches, 1(6), 1. Retrieved from https://telearn.archives-ouvertes.fr/hal-00190240/document

Earp, J. (2015). A systematic review of the research literature on game making for learning: Analysis of the full data set. Research Report, Institute for Educational Technology, National Research Council, Italy. Retrieved from https://www.researchgate.net/profile/Jeffrey_Earp/publication/283460359_Game_Making_for_Learning_A_Systematic_Review_of_the_Research_Literature/links/564db12f08aeafc2aab0014f/Game-Making-for-Learning-A-Systematic-Review-of-the-Research-Literature.pdf?origin=publication_detail

Gee, J. P. (2003). What video games have to teach us about learning and literacy. Palgrave Macmillan. Retrieved from http://www.politicalavenue.com/108642/GAME-DESIGN-BOOK-COLLECTION/%5BJames_Paul_Gee%5D_What_Video_Games_Have_to_Teach_Us(BookFi.org).pdf

Given, L. M. (Ed.). (2008). The Sage encyclopedia of qualitative research method (Vol. 1 & 2). Retrieved from https://books.google.co.id/books?hl=en&lr=&id=byh1AwAAQBAJ&oi=fnd&pg=PP1&dq=The+Sage+encyclopedia+of+qualitative+research+method&ots=LOP0NI3H9s&sig=_EhLzxPJ-hqlS2utG2PxDxYzh_w&redir_esc=y#v=onepage&q=The%20Sage%20encyclopedia%20of%20qualitative%20research%20method&f=false

Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. Journal

of Technology Education, 7(1). Retrieved from http://scholar.lib.vt.edu/ejournals/JTE/v7n1/gokhale.jte-v7n1.html?ref=Sawos.Org

Griffiths, M. (1997). Computer game playing in early adolescence. Youth & Society, 29(2), 223-237. Retrieved from ttps://www.researchgate.net/profile/Mark_Griffiths2/publication/233809231_Computer_Game_Playing_in_Early_Adolescence/links/53de894e0cf2a76fb668001e.pdf

Griffiths, M. D. (1999). Violent video games and aggression: A review of the literature. Aggression and Violent Behavior, 4(2), 203-212. Retrieved from https://pdfs.semanticscholar.org/19cc/a1acba04e9df87e351372e764172ec62cf46.pdf

Herz, J. (1997). Joystick nation: How videogames ate our quarters, won our hearts, and rewired our minds. Boston, Massachusetts, United States of America: Little Brown & Company.

Johnson, D. M. (1992). Approaches to research in second language learning. New York: Longman.

Kafai, Y. B. (2006, January). Playing and making games for learning: Instructionist and constructionist perspectives for game studies. Games and Culture, 1(1), 36-40. Retrieved from http://cmap.upb.edu.co/rid=1GQBQJKR1-M5S-MVC-7HK/19443702-Playing-for-Learning.pdf

Lehtinen, E., Hakkarainen, K., Lipponen, L., Rahikainen, M., & Muukkonen, H. (1999). Computer supported collaborative learning: A review. Retrieved from http://nexus.hs-bremerhaven.de/library.nsf/bf25ab0f47ba5dd-785256499006b15a4/30bb62d76118ded3c12578530056a136/$FILE/CollaborativeLearning.pdf

Murniati, C. T., & Sanjaya, R. (2015). The integration of educational game for collaborative learning. Soegijapranata Catholic University, Semarang.

Natale, M. (2002). The effect of a male-oriented computer gaming culture on careers in the computer industry. Computers and Society, 32(2), 24-31.

Roberts, T. S. (2005). Computer-supported collaborative learning in higher education. Idea Group Publishing. Retrieved from https://www.researchgate.net/profile/Tim_Roberts2/publication/242290346_Computer-Supported_Collaborative_Learning_in_Higher_Education_An_Introduction/links/00b-7d5187a4b822e4b000000.pdf

Robertson, J. (2012). Making games in the classroom: Benefits and gender concern. Computers & Education, 59, 385-398. Retrieved from http://intervox.nce.ufrj.br/~tiagoborges/artigos/Artigos%20CAPES/Making%20games%20in%20the%20classroom%20-%20benefits%20and%20gender%20concerns.pdf

Robertson, J., & Nicholson, K. (2007). Adventure Author: A learning environment to support creative design. In Proceedings of the 6th international conference on Interaction design and children (pp. 37-44). Retrieved from http://www.flipproject.org.uk/wp-content/papers/p37-robertson.pdf

Salen, K., & Zimmerman, E. (2004). Rules of play: Game design fundamentals. Cambridge, Massachusetts: MIT Press. Retrieved from https://gamifique.files.wordpress.com/2011/11/1-rules-of-play-game-design-fundamentals.pdf

Sanjaya, R., Murniati, C., & Blair, K. L (n.d.). Game Making as A Collaborative Learning Method. Retrieved from http://www.vnseameo.org/InternationalConference2017/materials/17_RidwanSanjaya_CeciliaTitiekMurniati_Fullpaper.pdf

Schacter, J. (n.d.). The Teaching Doctors. Retrieved from http://www.teachingdoctors.com: http://www.teachingdoctors.com/home_resources/Products

net/profile/Mark_Griffiths2/publication/233809231_Computer_Game_Playing_in_Early_Adolescence/links/53de894e0cf2a76fb668001e.pdf

Griffiths, M. D. (1999). Violent video games and aggression: A review of the literature. Aggression and Violent Behavior, 4(2), 203-212. Retrieved from https://pdfs.semanticscholar.org/19cc/a1acba04e9df87e351372e764172ec62cf46.pdf

Herz, J. (1997). Joystick nation: How videogames ate our quarters, won our hearts, and rewired our minds. Boston, Massachusetts, United States of America: Little Brown & Company.

Johnson, D. M. (1992). Approaches to research in second language learning. New York: Longman.

Kafai, Y. B. (2006, January). Playing and making games for learning: Instructionist and constructionist perspectives for game studies. Games and Culture, 1(1), 36-40. Retrieved from http://cmap.upb.edu.co/rid=1GQBQJKR1-M5S-MVC-7HK/19443702-Playing-for-Learning.pdf

Lehtinen, E., Hakkarainen, K., Lipponen, L., Rahikainen, M., & Muukkonen, H. (1999). Computer supported collaborative learning: A review. Retrieved from http://nexus.hs-bremerhaven.de/library.nsf/bf25ab0f47ba5dd-785256499006b15a4/30bb62d76118ded3c12578530056a136/$FILE/CollaborativeLearning.pdf

Murniati, C. T., & Sanjaya, R. (2015). The integration of educational game for collaborative learning. Soegijapranata Catholic University, Semarang.

Natale, M. (2002). The effect of a male-oriented computer gaming culture on careers in the computer industry. Computers and Society, 32(2), 24-31.

Roberts, T. S. (2005). Computer-supported collaborative learning in higher education. Idea Group Publishing. Retrieved from https://www.researchgate.net/profile/Tim_Roberts2/publication/242290346_Computer-Supported_Collaborative_Learning_in_Higher_Education_An_Introduction/links/00b-7d5187a4b822e4b000000.pdf

Robertson, J. (2012). Making games in the classroom: Benefits and gender concern. Computers & Education, 59, 385-398. Retrieved from http://intervox.nce.ufrj.br/~tiagoborges/artigos/Artigos%20CAPES/Making%20games%20in%20the%20classroom%20-%20benefits%20and%20gender%20concerns.pdf

Robertson, J., & Nicholson, K. (2007). Adventure Author: A learning environment to support creative design. In Proceedings of the 6th international conference on Interaction design and children (pp. 37-44). Retrieved from http://www.flipproject.org.uk/wp-content/papers/p37-robertson.pdf

Salen, K., & Zimmerman, E. (2004). Rules of play: Game design fundamentals. Cambridge, Massachusetts: MIT Press. Retrieved from https://gamifique.files.wordpress.com/2011/11/1-rules-of-play-game-design-fundamentals.pdf

Sanjaya, R., Murniati, C., & Blair, K. L (n.d.). Game Making as A Collaborative Learning Method. Retrieved from http://www.vnseameo.org/InternationalConference2017/materials/17_RidwanSanjaya_CeciliaTitiekMurniati_Fullpaper.pdf

Schacter, J. (n.d.). The Teaching Doctors. Retrieved from http://www.teachingdoctors.com: http://www.teachingdoctors.com/home_resources/Products

A VR Based Educational Game for Studying Mathematics

T. Brenda Chandrawati
Erdhi Widyarto Nigroho

ABSTRACT

Virtual reality is a technology that illustrates three dimensional environment simulated by computer. Virtual reality technology is widely used in various fields, such as medical field, architecture, entertainment and others. One example of applying virtual reality is using the game. In the game, players will be brought to play in a virtual environment so that players will feel different sensations as if they seem to be in the real world.

Mathematics lesson is a lesson that most students are not interested in. Many educational experts have sought to simplify and make students love this lesson. However, the effort has still a lot of obstacles. Virtual reality technology has been attempted for mathematics learning where players will be engaged into the virtual world of mathematics. Accordingly, the player is expected to be easy to accept a math lesson.

Keyword: virtual reality, mathematics, learning, game

INTRODUCTION

In the last recent years, technology has been rapidly developed and available for various fields, one of which is virtual reality technology. Virtual reality is a technology that demonstrates a three-dimensional environment simulated by

a computer and one can interact with that environment. In virtual reality, the environment is actually imitated and only exists in imagination.

Virtual reality technology is widely used in various fields, such as medical field, architecture, entertainment and others. One example of using virtual reality is in the game. When virtual reality technology is used in the game then the user feels as though they are in the game world.

This situation can benefit from creating a game that can facilitate the user to understand a particular subject that is considered difficult by most students i.e. the math game. According to Turmudi, educational experts and mathematics education experts have spent for many years in attaining a goal that mathematics can be well mastered by students. Nevertheless, the efforts show that not many students in each class favor the mathematics [1]. Then, the best solution in understanding the basic concepts of mathematics is presented by using games with virtual reality technology.

LITERATURE REVIEW

A. Virtual Reality Technology

Virtual reality technology enables one to simulate a real object by using a computer generating a three-dimensional atmosphere that makes the user as if physically involved. The virtual reality works as follows: a user sees a pseudo-world, which is actually a dynamic image; then, through a speaker or headphone device, the user hears a realistic sound; by the headset, glove and walker, each user movement will be monitored by a system that will give the appropriate reaction so that the user feels in a real situation, both physically and psychologically.

Virtual Reality Elements [2]

1. Virtual world, the content of a given medium that comes in the form of screen play or script. In this element, the user will experience the virtual world.
2. Immersion, the existing sensation in an environment. Immersion is divided into two types: mental immersion and physical immersion.
3. Sensory feedback, information that is displayed to the user's senses about the virtual world, sensory feedback can be visual, audio or touch.
4. Interactivity, the virtual world that response to user action in real time.

B. Serious Game

Video game is a medium of learning that mixes interesting pictures and sounds. Interesting pictures and sounds involving hand interaction to play games will give a player pleasure, and will earn good learning outcomes. Such games are called the serious game; they are not only used for fun but also used for the purpose of developing skills and habits.

The definition of a serious game differs from one researcher to another. According to Vinay, a serious game is defined as a software system that is a combination of serious dimensions, the goal is not for fun and gaming dimension, which has the element of game design and modeling concepts, game structure, game techniques and GUI [3].

Masakazu explains that the serious game was first mentioned in a book written by Clark C. Apt. In the book, the serious game was an effective game for education and training. Explanation of the serious game had been written before the computer game or video game was popular in the market. At the same time, simulators and simulation systems were used for educational needs, training, training support and strategic planning. After Game Developer Conference in 2004, serious games became popular and flourished in various areas. Masakazu also explains that basically entertainment games and serious games are the same computer games but have different usage [4].

C. Review of VR Game

Table 1.1

No	Game Name	Story	Segment	Arts	Interface	Education Opportunity
1	Finding	Adventure in searching Item	Kids	Japanese Anime	gamepad / touchscreen	To educate shape of space
2	Temple Run	Endless running	Teenagers	3D Animation but not detail	touchpad	To introduce letters or shape of space
3	Road rage	Driving car	Kids	Draft Animation	touchpad	To introduce letters or shape of space
4	Dragon Front	Card Game Battle	Teenagers	Japanese Anime	touchpad	All types of education

5	Cosmos Warfare	Spaceship Battle	Public	3D Graphic detail	touch pad	To introduce letters or shape of space
6	Adventure Cat	Adventure of RPG	Kids	Japanese Anime	touchpad	To educate introductory and simple math
7	Shinoko	Adventure of RPG	Kids	Japanese Anime	touchpad	To educate introductory and simple math

METHODOLOGY

The selected research objects are elementary school s From the design process to the game played by a user, it will go through several stages :

1. Determine the game genre to be created, in this research the serious game is selected as one of the genre of games that have been known.
2. Selection of tools to be used in the game.

   Selected tools will be used to create assets, including the selection of sounds and tools that will be used to develop the game.
3. Gameplay formulation

   Gameplay is a pattern or mechanism used to manage the interaction between players and games created. Gameplay also arranges for players to experience a fun game.
4. Preparation of assets and design level

   The concept of all the characters and grouping of difficulty levels is arranged at this stage. It aims to get players to experience the optimal play
5. Development

   At this stage all characters and assets begin to be enhanced in full development and all elements are integrated.
6. Alpha / close beta test

   This stage is done to determine whether it has been able to provide the player experience in accordance with expectations as well as to detect whether there is a technical problem. students with age range 6-7 years around Semarang city.

DISCUSSION

From Table 1.1, the opportunity to educate is the introduction of space and figure form. A simple game on virtual reality game is good for the introduction of space shape, such as rectangular shape, triangle circle and so forth. This game model is “Endless Run” like “Temple Run”, “Sub waver” and others. The player will walk looking for a square shape. When the shape appears, the player must shoot the square shape. If the shot misses, it will reduce the player’s life. The player’s life has 3 (three) chances, then the game will be finished. If the shoot hits the target, the player will score 10. Here is the game introduction of space shape based on virtual reality

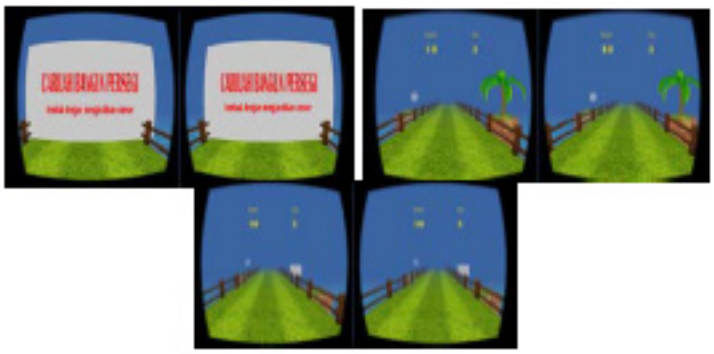


Figure 1. VR Game Display on Space Shape

Players will be brought into the 3D world so it will make a child like being in the real world. Next, the child will interact with how to find the shape of space learned. In accordance with the principle of learning, learning will be more successful with the interaction between players with the subject taught. Likewise, the player will get learning over and over again and feel happy and challenged by searching for the appropriate shape of space to get points and avoid loss of life.

The weakness of this game is the player cannot choose any form of space, so his life will not run out and the game is never finished even if the player does not add the score. For that reason, it is necessary that the rules are given time constraints. In addition, selecting the exact shape will add points and additional time, so the game will be more challenging

CONCLUSION

Games with VR base bring players into the virtual world so it is possible to include the learning process, especially math lessons

Learning the introduction of the numbers and letters can be applied easily to the VR-based Game

ACKNOWLEDGMENT

The result of this study is a grant from the ministry of Research and Technology Research Indonesia for applied product research.

REFERENCES

Mulyono Abdurrahman 2003, "*Pendidikan bagi Anak Berkesulitan Belajar* ", Jakarta: Rineka Cipta hal. 252

LaValle, Steven M, "Virtual Reality", Cambridge University Press, 2017

Vasudevamurt, Vinay Bhargav and Alexander Uskov, "Serious Game Engines : Analysis and Applications", Proceeding of 2015 IEEE International Conference on Electro/Information Technology (EIT), 2015, Pages: 440 - 445

Furuichi, Masakazu, Megumi Aibara and Kazuki Yanagisawa, "Design and Implementation of Serious Games for Training and Education", Proceeding of 2014 UKACC International Conference on Control (CONTROL), 2014, Pages: 691 - 695

LEARNING TECHNOLOGIES FOR SPECIFIC DOMAINS

iPon: A Personal Finance Mobile Application Software that Encourages Smart Money Management and Financial Skills

JC DOCTOR
MR MITSCHEK
KM PALIZA
JT TIONG
GM SABILE

ABSTRACT

iPon is an educative application which aims to teach its three target users which are the students, employees, and families on how to properly budget their own allowance in an entertaining way and also with the use of their smartphones. The application is consist of six different features such as Expenses, Tips, Budget Guide, Notes, Calendar, and Summary of Savings. It also allows the user to budget their allowance from daily, weekly, or monthly.

This application is exclusive only for android operating system. The developers made sure that the application's contents are clear and easy to understand. The user will just have to interact with the application in order to monitor and track his or expenses and savings. The application will provide a notification for the user that can serve as a reminder, and a recommendation so that the user will always have to prioritize his or her savings.

The software used in creating the iPon is with the help of Android Studio, Adobe Photoshop CS5, Adobe Flash Professional, and an online database called Firebase.

The result of the evaluation that the proponents conducted, resulted as Moderately Agree with the five categories such as appearance, structure and navigation, content, usability, and designs.

Keywords: *Budget Tracker, Financial Education, Financial Literacy, Mobile Application, Money Management*

INTRODUCTION

Money plays an important role to one's life, it is also now a part of our daily needs. Without money you won't be able to buy your basic necessities, you can't survive for too long without having a money. Most people fail to balance between saving and enjoying their money. Enjoying money can satisfy us in different ways, it gives us joy, excitement, and happiness, but isn't it more satisfying if we enjoy our money while we are saving too? We can fulfill our needs while learning how to save from our own money as well.

iPon is a Filipino term that means "to save", where basically is the main function of the application. Aside from money management, the proponents are also offering an educative application for the users, where they can also learn the importance of properly managing their allowance and the benefits that they can get from it.

Nowadays, mobile phones are a big part of our lives, especially for the youth. It gives us the convenience and efficiency that we need. We can do all things through the use of our mobile phones. It will be less time consuming since all that we need are already in our mobile phones. Different helpful applications are now available for downloading.

Mobile phones have different types of operating systems such as Windows, iOS, and Android, but android is the most popular one, since it is more affordable than other operating system. It is marked as the top mobile operating system in the Philippines in December 2013 according to Cameron Peebles. It is said in the published report that Filipinos prefer Android than any other operating system.

REVIEW OF LITERATURE

FOREIGN LITERATURE

The 11 Best UK Apps for Money Management and Personal Finance.

Fearn, 2016

Many of us have a number of different bank accounts, such as one for personal spending, another for savings, and another still dedicated to paying off bills. Even if it's just remembering all of your passwords and login details, you'll know that managing all of them effectively can be a struggle, especially when all you want is an overview of your balances. That's where Money Dashboard comes into the mix. Compatible with all UK bank and credit card companies, it allows you to view the balances of all your bank accounts instantly and aims to help you make more informed decisions by identifying your spending habits.

Money Dashboard can also provide the user the money management that they needed which can be used for personal spending with the bonus of being educated about the importance of money management.

Best budgeting apps: 7 apps to take control of your finances.

OnTrees, 2016

OnTrees is the budgeting app from MoneySuperMarket and it makes keeping track of your money nice and simple. OnTrees works with major UK banks in order for you to track exactly what is coming in and going out of your current account, savings accounts and credit cards, in one place with one login. This app sorts your transactions into colorful categories so you can see where you are spending and what you could save on. It also delivers detailed information about your spending habits with charts and icons. OnTrees is available to download for Android and iOS.

OnTrees and iPon are both available for Android users. The feature that is the same with our application is that it can provide different categories on where your moneys are being spent.

By doing away in the 'accounting jargon', KashFlow has created an app for the ordinary user.

KashFlow, 2015

Moneytrackin' is a free online web app that allows you to track all your expenses and income easily and without effort. The app intends to be a simple yet powerful online budget management tool that offers you a clear view of your financial situation. One interesting feature of the app is sharing and collaboration. If you are working with a family member or your roommate to keep budgets in line, you can do so with ease and work together on the same account to reach financial goals.

iPon and Moneytrackin' will both help the user to manage their money properly. It will both let the user to keep track of their expenses.

Money Management Skills for Youth.

Money Management International, 2016

It is never too early to start teaching children money management and financial skills they will need for life. With our advice articles you can teach kids the importance of basic mathematics, financial goal setting, and responsible money management. Find the resources and money management tips for kids that you need to raise your children to be financially successful adults.

At an early age, kids can now benefit by starting to learn how to manage their own money. It is much easier for them if they can have an application that can provide them the proper tips and guide on how to properly handle their allowance and for them to know how value to save money. This features will also be offered with our application.

LOCAL LITERATURE

Online Tools You Can Use To Monitor Your Budget.

Denise Foz, 2016

The Philippines ranked 68th in the world in terms of financial literacy in a recent study conducted by the Asian Development Bank (ADB), the Philippines was revealed to lack a national strategy for financial education. The study was further supported by a 2014 research by MasterCard, which indicated that Filipinos score low on financial literacy. The Philippines ranked 8th among Asia Pacific countries. Filipinos should start to educate themselves and make use of available financial tools to help manage their finances wisely.

With that being said, the proponents came up with an idea of developing a tool that can help Filipinos manage their monthly allowance. Aside from managing, the application will also provide tips and guides where they can learn from.

The Philippine Online Chronicles.

Rachel Yapchiongco, 2014

TRAIL WALLET is a travel expense tracker ideal for people who love to travel. Trail Wallet can help you determine if you're sticking to your budget or spending too much than previously planned. This app tells you if you still have enough money to spend on your trip. It tells you how much you spent and available funds. Just choose your home currency and convert your money to desired foreign currency. Set a daily budget then add expenses each time to get a bill or receipt. Organize expenses according to items such as accommodation, food, transport, miscellaneous, etc. Customize by creating color coded categories. At the end of your trip, you'll be able to see how much you have spent. It features Twitter and Facebook support. You can also email CSV reports directly to the app.

The said application can be used specifically for travelling purposes. The same as our application, they both set a budget that must be used, and lets the user add the amount of expenses he spent. Compared to proponents application that there are proper tips and guide on how to properly handle their allowance and for them to know how value to save money.

Want to manage your finances better? Here are some apps.

News A, 2014

This app downloads and consolidates all your financial records, including your checking accounts, savings accounts or credit cards (if your bank is included in its list of banks). All you have to do is just refresh your account. This way, you do not have to log on to different online banking sites just to see your balance. If your bank is not among those that Koku can connect with, you can import your statements into Koku. The app also provides an analysis of your income and spending habits. Since it automatically syncs to iCloud, you will be able to access your account from anywhere using your Apple device.

Like any other application it also provides the use of credit cards and bank accounts, but the down part is that it is only available for iOS users. The proponents think is more hassle to use their app since there are lot of users used an android phones.

Free Apps That Keep Your Budget in Line

MoneyMax.ph., 2015

Who needs a personal accountant if you have Expensify on your phone? This popular app categorizes, tags and groups expenses into a report, which you can also save as PDF, for easy report submission. It has SmartScan technology that automatically reads receipt details for you, bank and credit card import that automatically pulls your transactions into your account, free flight alerts plus automatic expense report based on itinerary, and more cool features gets rid of any manual entry, saving you a lot of time and energy.

iPon also helps the user in tracking their expenses or where their money goes. This application also helps you to manage your allowance by not wasting a lot of time and energy.

METHODS

It is all about the overall flow and operation of the application, including the technical aspects of it. This also includes the basic structure of the application and the software that are used in developing it.

In creating the design of iPon we considered different factors that can help to the effectiveness of the application for the user, these factors are the color, the type of text, the structure, and the positioning of different components like the texts and buttons. We chose the colors light blue and white because it is more pleasant for the user's vision since it is a good color combination. We also used a bigger font size because we are considering the capability of the user's eyesight. The structure of the application is not crowded because we want the user to become familiarized with the application easily, some applications that has a crowded structure are also complicated to use. The positions of the components are easy to find and we also put labels in the buttons that we used so that it is more understandable for the users. All of these are done with the use of the software Adobe Photoshop CS5.

For the function of the application, the user has to create an account using a valid email address. The account will serve as a unique identifier in storing the data and information that the user will input. Data such as the user's full name, daily/weekly/monthly allowance, notes, and the user's expenses. The full name of the user will be the application's user profile. The allowance that the user will enter will be automatically computed according to the fixed percentages provided by the application, this is also the main feature of the application, which is to provide the breakdown of the user's allowance which can serve as their guide in their daily, weekly, and monthly expenses. For additional convenience, the additional feature of the application is that the user can add and delete notes, this is for listing purposes where instead of writing down your grocery lists on a piece of paper. Lastly, the user can be able to track his/her expenses whenever he/she will input the specific amount he/she spend depending on what category it is. There is a provided feature where the user can view the summary of expenses he spend. All of the functions are done with the use of Android Studio and Firebase.

An animation about money budgeting will also be provided by the application for additional entertainment and for educational purposes. The animation is done with the use of Adobe Flash Professional CS6.

Research Paradigm

Agile Methodology is an alternative to traditional project management where emphasis is placed on empowering people to collaborate and make team decisions in addition to continuous planning, continuous testing and continuous integration. It is also a group of software development methods in which requirements and solutions evolve through collaboration between self-organizing, cross-functional teams.

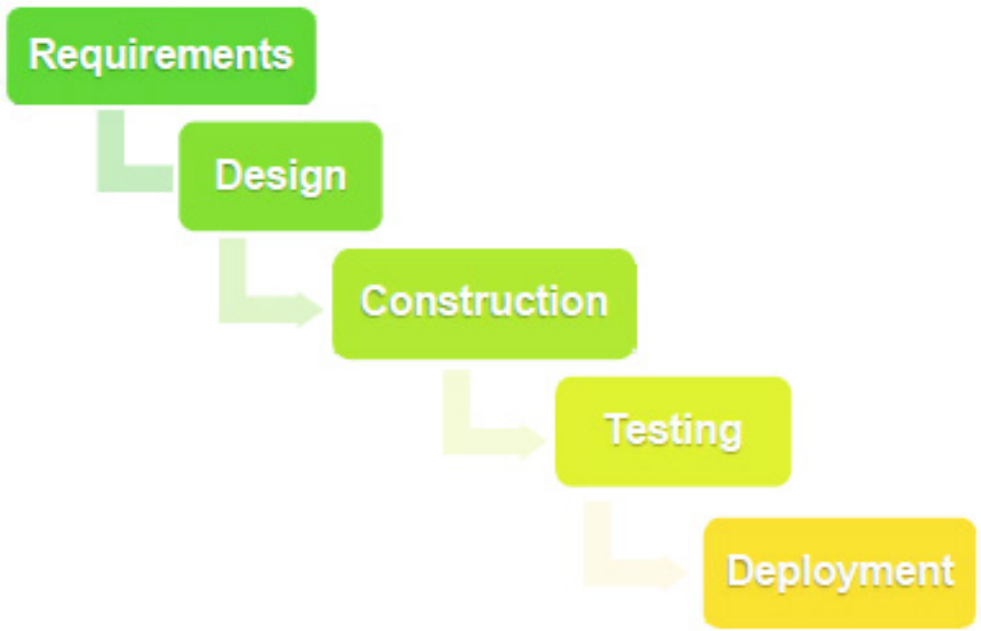


Figure 1. Agile Methodology

Requirements

The definition of requirements in agile methodology is to come up with Requirement Specification document or documents. The aim is to define the requirements in as clear and as detail manner as possible. Normally in order to capture, collect and gather the requirements. The success or the failure of the software project being created will depend on the first phase of waterfall model, which is the requirements.

The requirements that the proponents did for the system is to analyze the different software that can be the most applicable in developing the application.

The proponents have decided to use the software Android Studio for the functions of the application, and for the design the proponents used Photoshop CS6. The proponents also gathered different information needed from the target users through a survey with the help from professionals.

Design

In agile methodology, design is about the activity before the programming. It is about stylizing the software application. It is all about the activity involved in conceptualizing, framing, and implementing the solutions for the progress of the application being developed. The main purpose if this stage is to create a blueprint that will satisfy all documented requirements, then to identify all inputs, processes and outputs needed

The proponents all agreed to use Photoshop CS6 in conceptualizing for the concept of the application. The framework for the software process will all be planned in this phase.

Construction

Construction is all about the coding, verification, and debugging of the software. This phase is the most detailed and complicated work, since this is where every functions and processes of the application will all depend. Its purpose is to implement the requirements from the design phase to the software.

The proponents decided to use the Android Studio as a software for creating the function for the application, basically for implementing and debugging the codes for the system to work well as planned.

Testing

In this phase, it is the attempt to execute the program even if it is partially complete. By testing your software's process, you can determine the quality and the function you are about to provide for the future users. Although testing cannot fully identify the defects of the application being tested.

The proponents' strategy is to test the software every time a progress is added, in this way the bugs or the error can be determined ahead of time and can be fixed. By testing the application, the developers can also identify what else needs to be added and what should be polished more.

Deployment

The deployment or release phase is about all the activities that makes the application complete and ready for use. Basically it is the finished project where it can now be functional according to what is planned.

This is where the proponents will upload the finished project to the site where it can now be downloaded and ready for the users.

Conceptual Framework

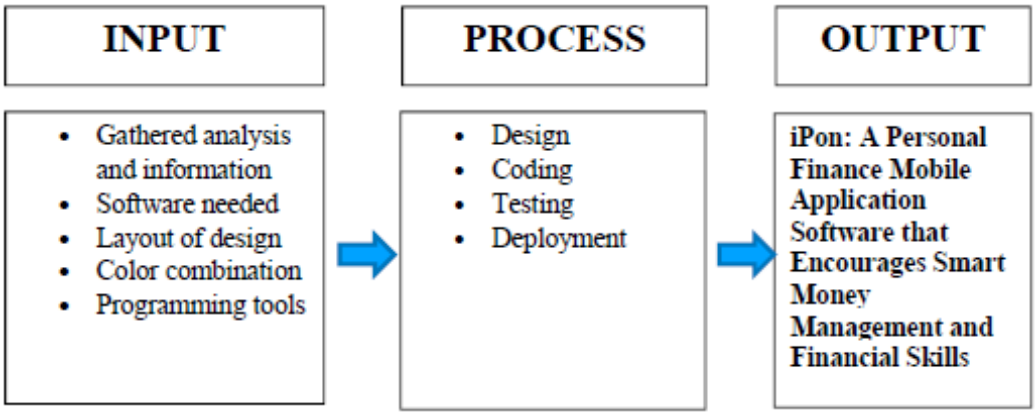


Figure 2. Conceptual Framework

As presented, the framework has three component: input, process and output. In order to develop the Android Application "iPon", it is necessary to include the following inputs: gathered analysis and information, software needed, layout of design, color combination and programming tools. Given these inputs, the different processes involves are system design, coding, testing and deployment. After given processes, the development of iPon money budgeting application will be the output.

Project Development

The designs used in the application are shown through a screenshots with the explanations down below.

Screenshots

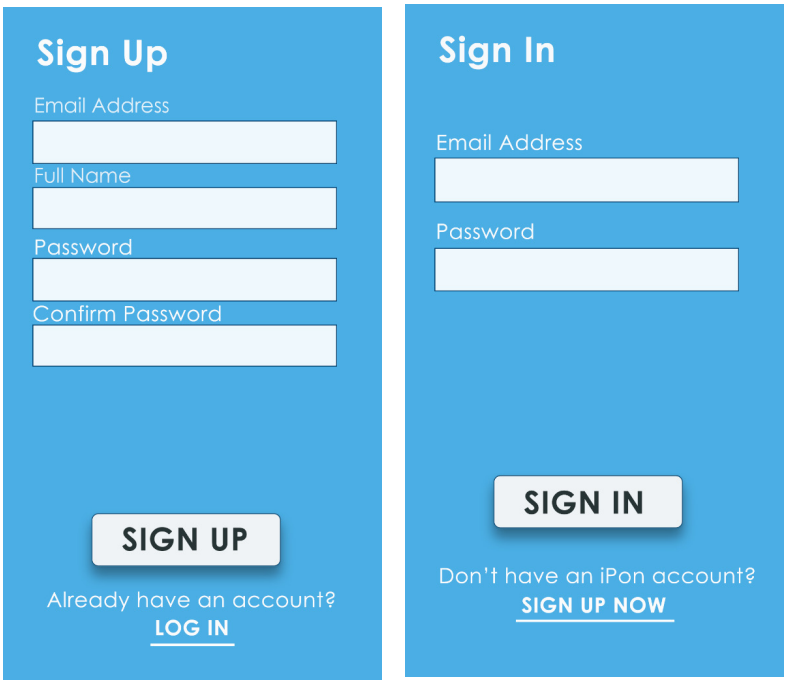


Figure 3 Sign in and Sign up

The user should have an account first in order to use the application, this is the only part that is needed to have an internet connection. The account will serve as a unique identifier so that the information and the data that are being inputted will store in one database. Therefore, each user can have a different access in using the application. The redundancy of the functions and data can be avoided.

Figure 4. Welcome Page

After the registration, the welcome page is displayed. This page allows the user to view the About Us, About the Application, and the user can be able to watch a short animation about the importance of budgeting.

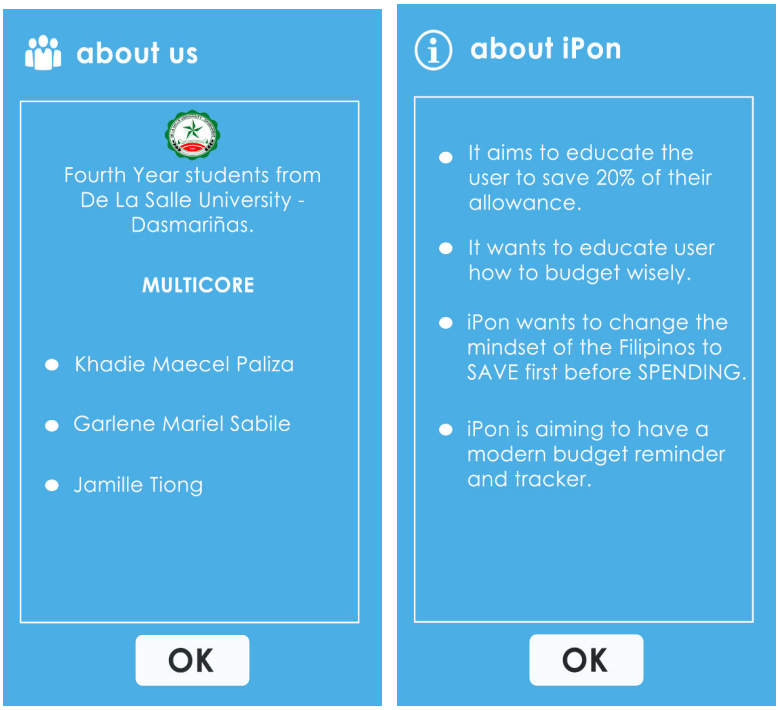


Figure 5. About the Application and About Us

About iPon displays the different goals that the application wants to expect from the user. The first priority of the application is to teach the user to save 20% from their allowance. The whole application focuses in reminding the user to spend less and save more, aside from it, this can also serve as a modern budget reminder through the help of a daily notification that the user can receive every day in a specific time. About Us displays the name of the proponents, their group name, and the school they are studying.

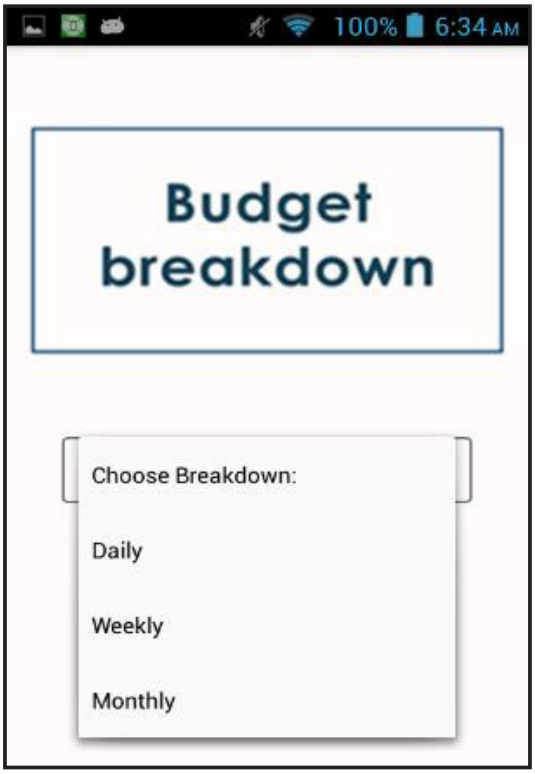


Figure 6. Choose budget breakdown

This page is the choosing of the user's budget breakdown, this can be from daily, weekly, or monthly. Since not all users are receiving an allowance every day, every week, or just every month. That is why this application is providing three different options that the user can choose from.

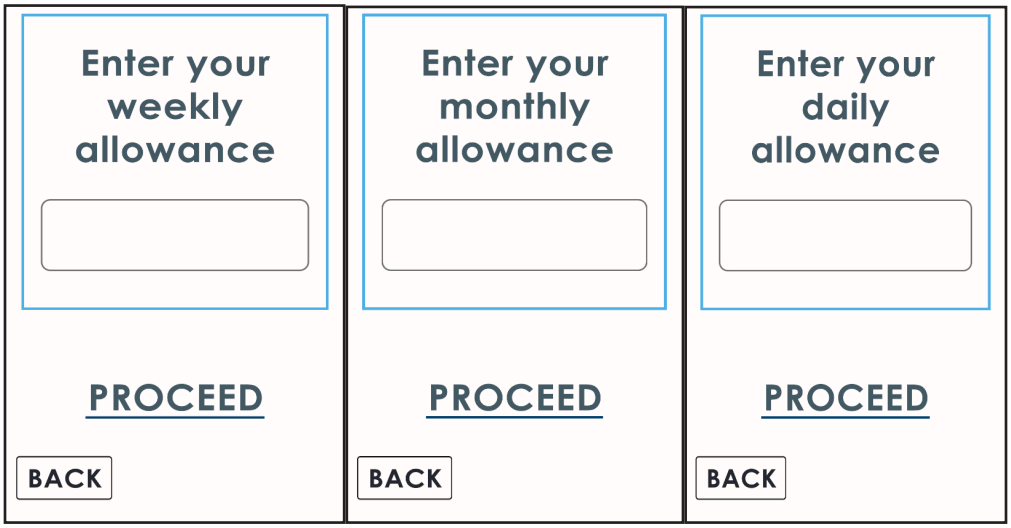


Figure 7.. Enter your allowance

The user should input their allowance according to their budget breakdown whether it is daily, weekly, or monthly. The inputted allowance are automatically computed using a fixed percentages and this serves as their guide for budgeting.

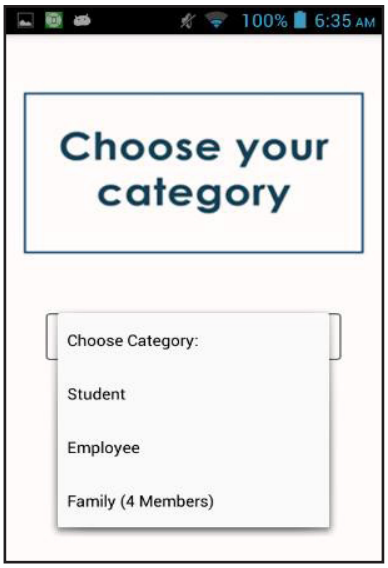


Figure 8. Choose category

The application's target user are the students, employees, and families. Each category provides different expenses for different users, so that the application can satisfy all the needs of each of them.

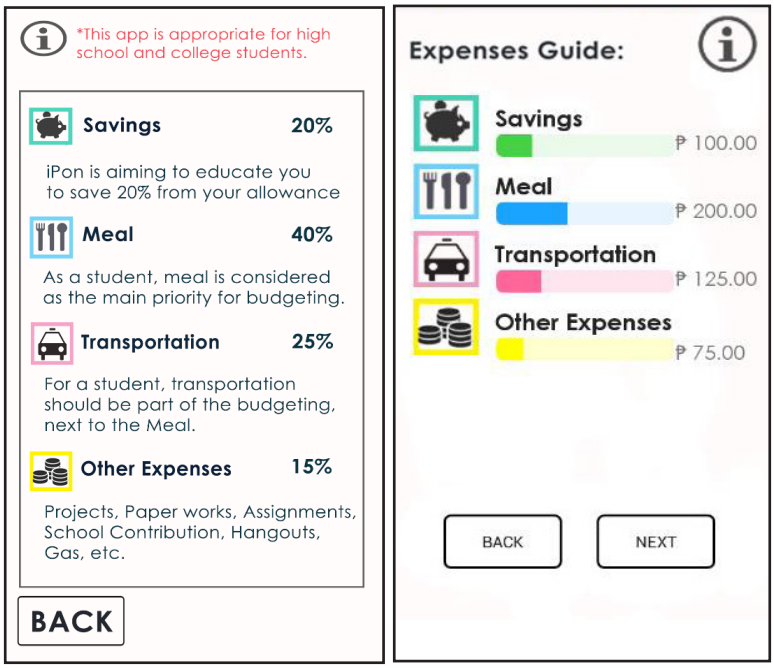


Figure 9. Student's guide

For the student's guide, the user can view a progress bar where he or she can have a guide of computed amount for each expenses.The user can also view the transparency of the computation in the information button placed at the upper right of the page. There is also a brief explanation for the purpose of each expenses, the percentages are also indicated beside of each category. Aside from this, there is also an indicated recommendation above wherein there is a text that shows for who the application can be more appropriate.

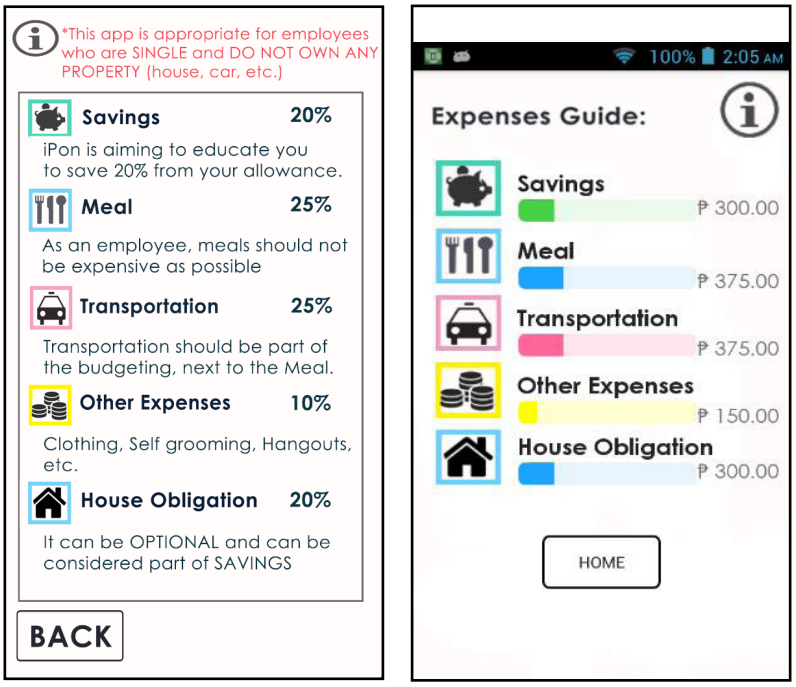


Figure 10. Employee's guide

For the employee's guide, the user can view a progress bar where he or she can have a guide of computed amount for each expenses. The user can also view the transparency of the computation in the information button placed at the upper right of the page. There is a brief explanation for the purpose of each expenses, the percentages are also indicated beside of each category. Aside from this, there is also an indicated recommendation above wherein there is a text that shows for who the application can be more appropriate.

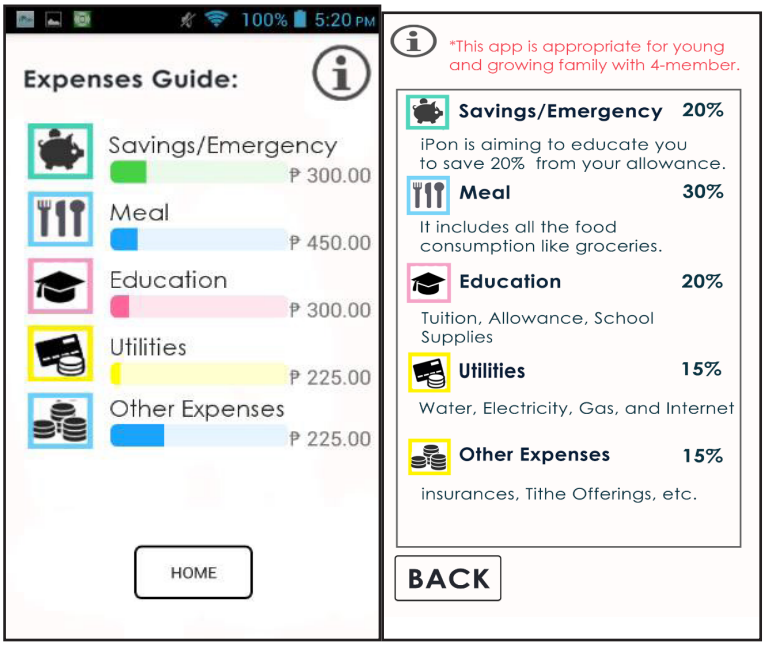


Figure 11. Family's guide

For the family's guide, the user can view a progress bar where he or she can have a guide of computed amount for each expenses.The user can also view the transparency of the computation in the information button placed at the upper right of the page.There is a brief explanation for the purpose of each expenses, the percentages are also indicated beside of each category. Aside from this, there is also an indicated recommendation above wherein there is a text that shows for who the application can be more appropriate.

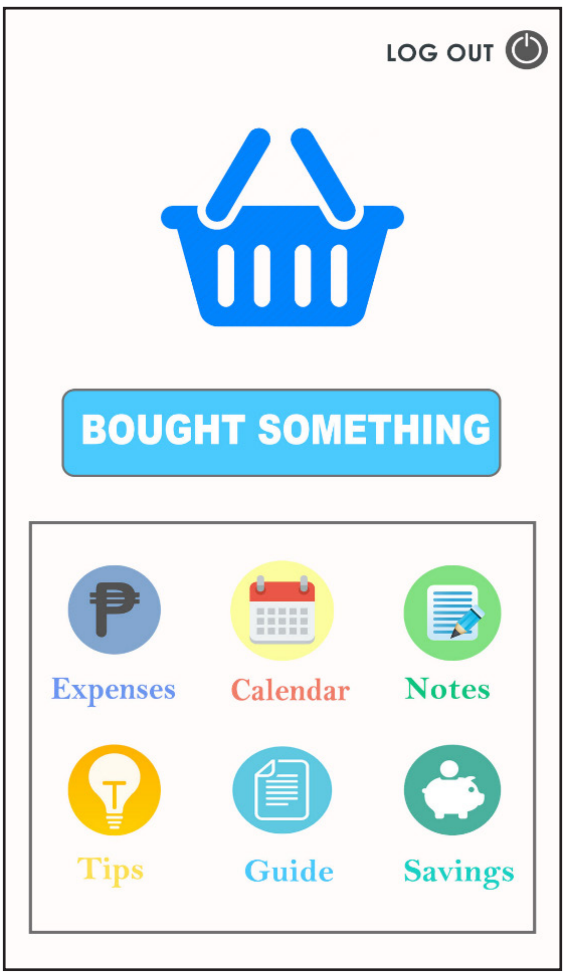


Figure 12. Home Page

This is where the user can view most of the functions and features of the application. In the home page, the user can be able to change the settings of the application and can also log out in this page if he or she wants to. The button labeled as Bought Something leads the user to the inputting of expenses. Every time the user has inputted something, the application automatically recorded it. This can help the user to track and monitor his or her expenses. The application has also provided six different features for the users.

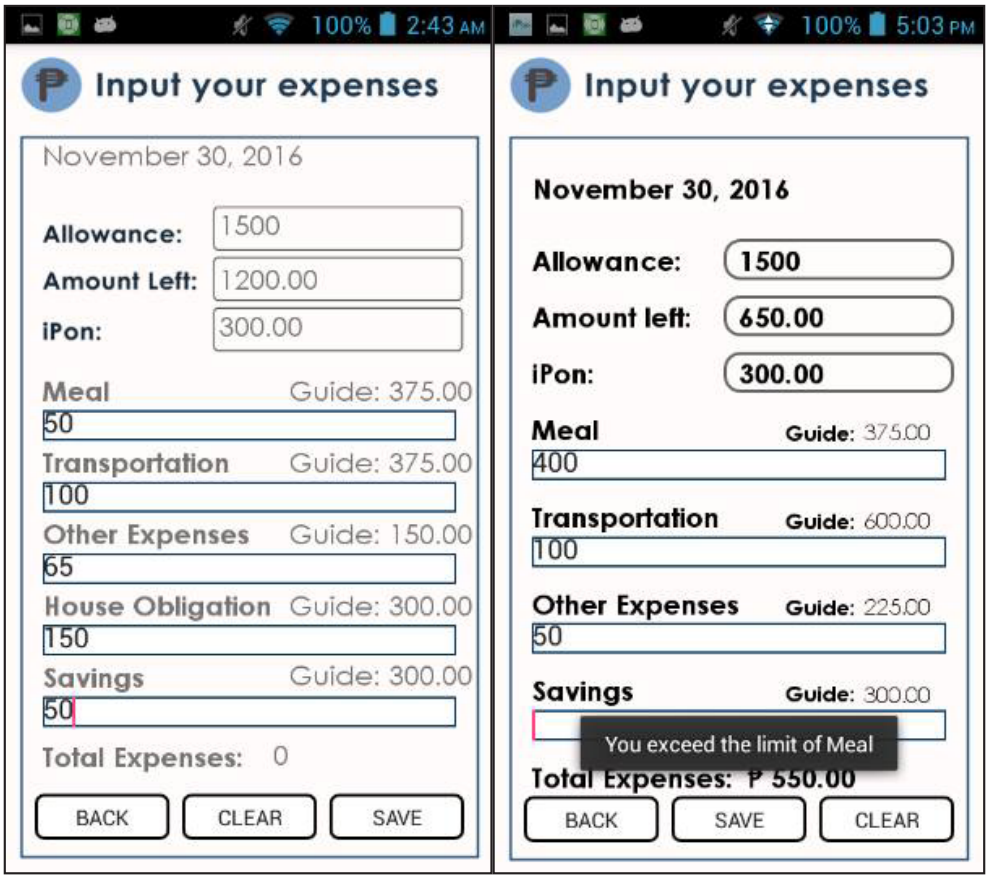


Figure 13. Inputting of Expenses

The user can be able to input a specific amount of expenses that he or she wanted to. A real time date is also automatically indicated. Beside is an amount of guide that is based on the previous progress bar shown above, in this way, the user can be able to monitor if he or she exceeded the specific amount that the user should be spending. The user can also view the allowance that he or she has inputted, and the savings he or she is making, and also his or her total expenses.

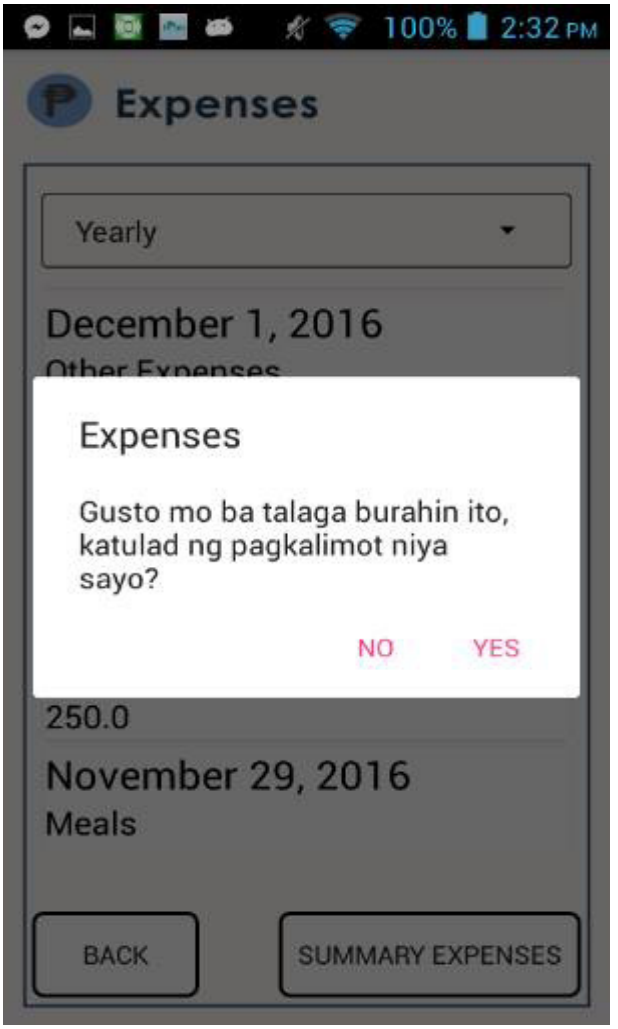


Figure 14. Deleting of expenses

There are times that the user just wanted to experiment in inputting his or her expenses just to test it. That is why the application provided a delete option for the user so that his or her expenses will restart and will go back to zero. A dialog box also appears if the user is going to delete something from the expenses.

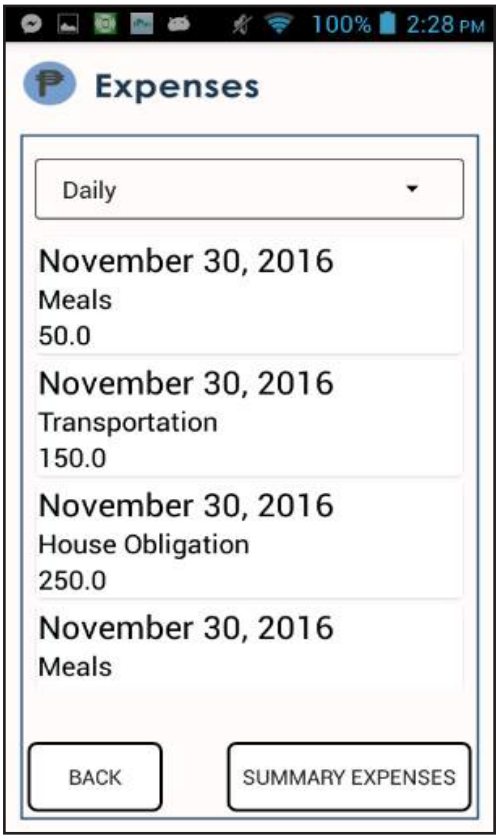


Figure 15. View of expenses

The view of expenses has an indicated date that depends when the user inputted his or her expense. The total amount of expenses can also be viewed. The expenses can be divided according to daily, weekly, monthly, or yearly.

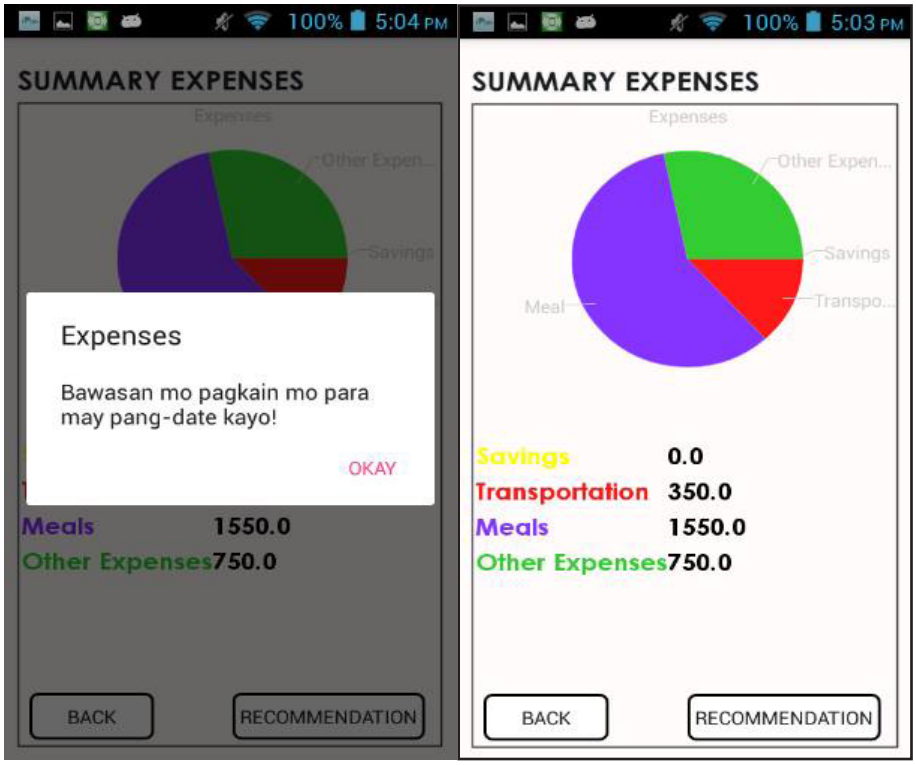


Figure 16. Summary of expenses and Recommendations

The user can be able to view his or her summary of expenses through a pie chart, the biggest part is where the user has spent the most. The user can also check the recommendation given by the application, if what should be prioritized and what should be lessen, which are shown through a dialog box.

Figure 17. Calendar

A calendar is provided for the efficiency of the users, they are able to input an expenses in advance, since the calendar can allow to select a date even if it is not the current day. After clicking it, it will direct them to the inputting of expenses shown above.

Figure 18. Notes

Notes can be the user's modern grocery list. It works the same as to writing in papers, because the user can be able to add and delete whatever he or she listed. A dialog box appears to ask if he or she really wants to delete something from the notes.

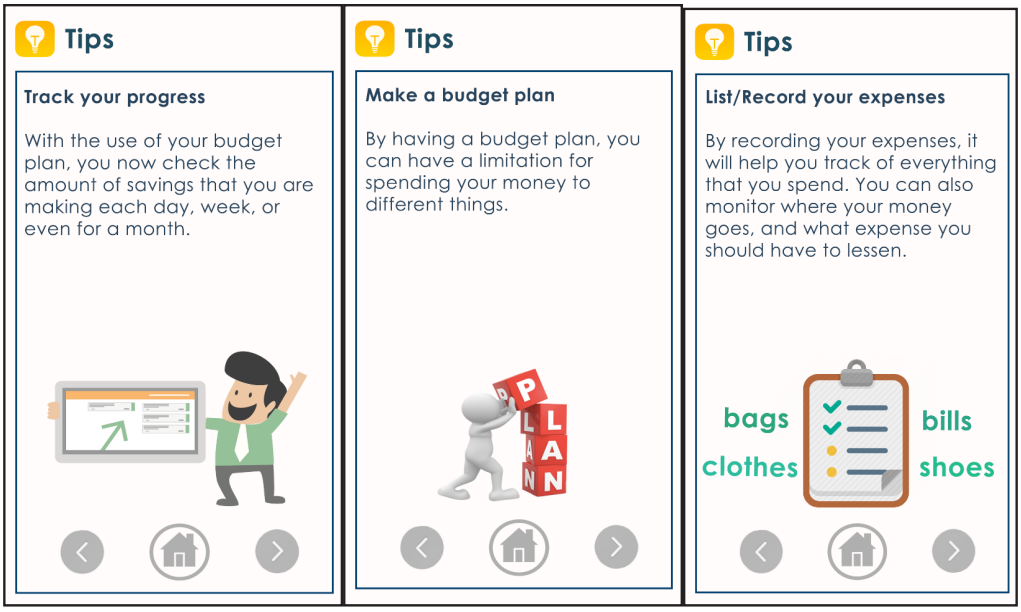


Figure.19. Tips

The application provides fifteen different tips that can give more encouragement to the user to budget their allowance. Aside from helping or guiding the user in properly handling their allowance, it can also teach the user to save money and avoid impulse buying.

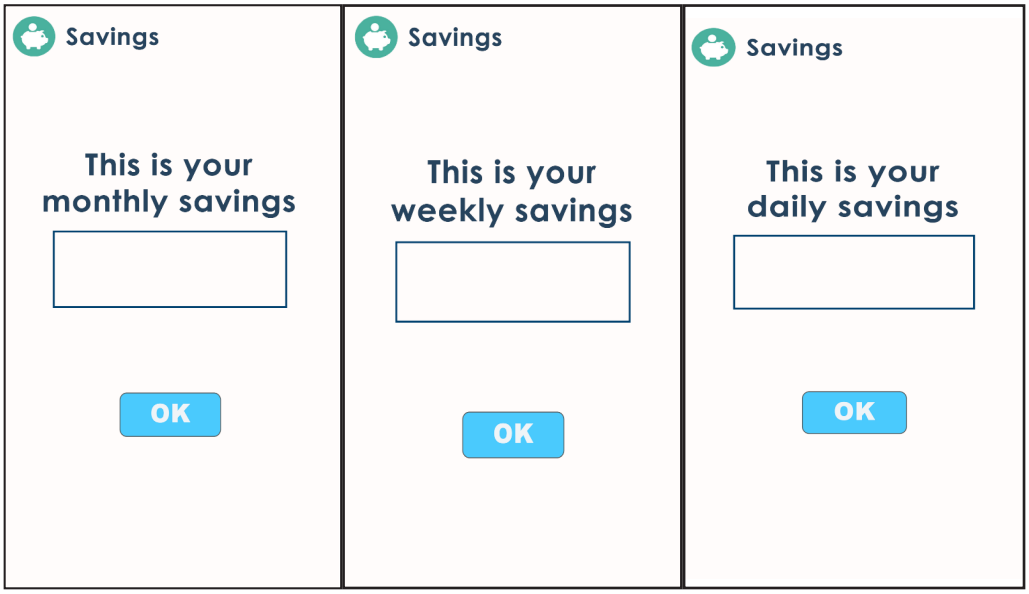


Figure 20. Savings

In savings, the user can view his or her savings daily, monthly and weekly depends on the category that they choose. In this feature, the user can monitor how much did he or she save per day, per month or per week.

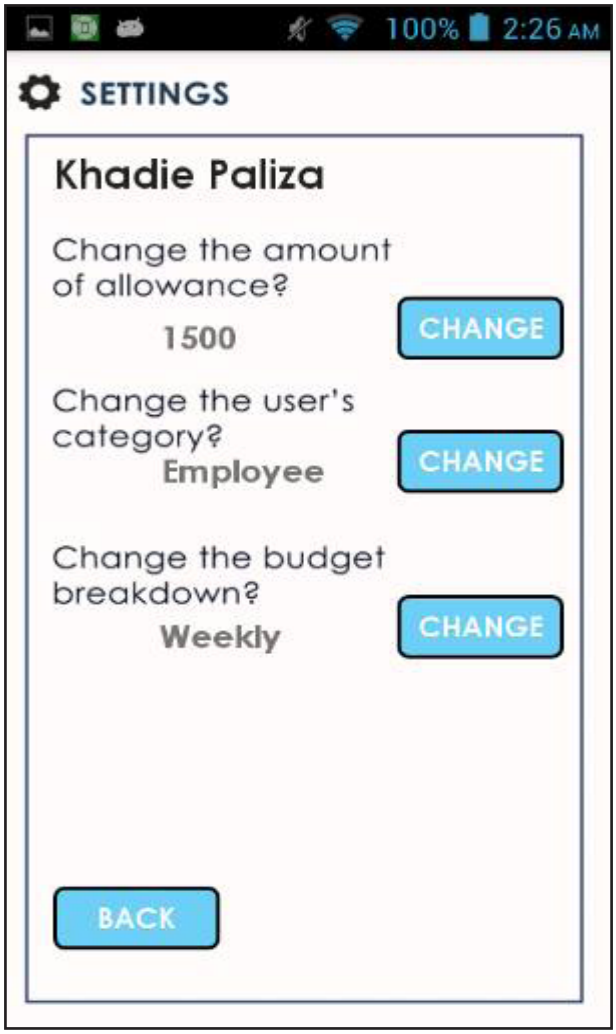


Figure 21. Settings

This application has a setting button, where the user can change their allowance, his or her budget breakdown, and the category that they chose.

Development Planning

It is a very important part of developing an application. If it is not done correctly, it might end up in some serious mistakes, the proponents cannot also achieve the application that they want to develop. The planned requirements will also not be able to accomplish and will just result to a huge waste of time and money.

Software Suited for Development

The proponents believed that there are other factors that you should consider in order to achieve an effective and useful application. The following are the applications that the proponents used to produce the design and the coding of the system:

- **Android Studio**
  Android Studio is a software that you can use for the coding of the application which will run in an android devices. It is also the official IDE Android Application Development. This software has a rich layout editor that you can use for drag and drop theme editing. It also code templates that can help you build common application features.

- **Adobe Photoshop CS5**
  Adobe Photoshop is the predominant photo editing and manipulation software on the market. Its uses range from full featured editing of large batches of photos to creating intricate digital paintings and drawings that mimic those done by hand.

- **Adobe Flash Professional CS6**
  It is an authoring tool that you can use to create games, applications, and other content that responds to user interaction. Flash projects can include simple animations, video content, complex user interfaces, applications, and everything in between. In general, individual projects created with Flash Professional are called applications (or SWF applications), even though they might only contain basic animation. You can make media-rich applications by including pictures, sound, video, and special effects.

- **Firebase**
  It is a mobile and web application platform with tools and infrastructure designed to help developers build high-quality apps. Firebase is made up of complementary features that developers can mix-and-match to fit their needs. Firebase's initial product was a real-time database, which provides an API that allows developers to store and sync data across multiple clients.

Requirements Analysis

The software that are needed should be capable in developing the application, it should also be suited for the devices that the proponents' are using, in order to avoid wasting of time.

Blueprint of the structure should be handed to all of the proponents to avoid misunderstandings with the plans. The functions and the designs of each view of the application should meet the requirements.

Proponents should expect to do a sudden change in design and coding during the testing of the application. They should also expect to have an analysis each test that they make.

Languages Used

The most suited programming language that the proponents used is the Java. It is a kind of programming language that has a general purpose, it is also designed to only have a few implementation dependencies as possible. Since the application has a broad functions, Java helped the proponents to lessen the complication in developing.

Evaluation of the Projects

Respondents of the Study

The respondents of the evaluation of the study are the students from high school to college who are studying at De La Salle University - Dasmariñas, employees who are single and does not own any property, and lastly a starting and growing families who has a four member in total. They are the main targets of this study because the proponents want to help them not to waste their money for unnecessary things. The proponents let the respondents to evaluate the money budgeting application system according to the application's appearance, its structure and navigation, the application's content, its usability, and lastly its design.

The students from senior high school to college and the employees also answered a survey form that answer the details that are needed in developing the application such as the amount of their usual daily allowance, the budget breakdown of their allowance for each category of expenses so that the proponents can have the proper allotted percentage that they should use in computing for the user's guide, lastly is a question about the willingness of the respondents in downloading the application. The details of the expenses of the families are came from the advices of the financial analysts.

Research Instruments and Techniques

The proponents distributed a survey forms and evaluation forms as their data gathering instrument to collect the information that they need in the study. The result of the conducted survey served as the basis for the application, if it still needs some improvement or changes. The respondents are asked about the application's user friendliness, effectiveness of the application, design of the application, and if it is worth using and downloading.

Survey and evaluation forms are used to test the validity and reliability of data gathering at the proposed application. The value of results depends heavily on the sincerity, truthfulness and objective of the respondents.

Data Gathering Procedure

Data collection is the process of gathering and measuring information on variables of interest which enables one to answer stated research questions, test hypotheses, and evaluate outcomes. The goal for all data collection is to capture quality evidence that translate to reach data analysis and allows the building of a convincing and credible answer to questions that have been posed.

The proponents collected the data needed from the respondents through the use of the data gathering instrument which is the survey. The results are tallied after the survey was conducted.

RESULTS AND DISCUSSIONS

Statistical Treatment of Data

The proponents tallied the answers of the respondents in the survey conducted, the details gathered are used in developing the application. This survey answered how much of their allowance are they putting in savings, meals, transportation, other expenses, and house obligation for the employees.

The proponents tallied the scores given by the respondents who are the students, employees, and families who evaluated the evaluation form. This helped the proponents to define whether the application is effective and efficient enough for the students, employees, and families who used it. In getting the total evaluation grade of the respondents for each category, which are the application's appearance, its structure and navigation, the application's content, its usability, and the design. The proponents computed the sum of each of the ratings according to what the question is. To get the average, the proponents used the formula below wherein (A) is the number of respondents who answered for the evaluation.

Different rates per categories are shown using a table below. The inputted number are already tallied. There are five tables that show the answers of the respondents with the evaluation form. The ratings are based by putting numbers from 1-5 wherein 5 is the highest and 1 is the lowest.

1 - Strongly Disagree
2 – Disagree
3 – Agree
4 – Moderately Agree
5 – Strongly Agree

Evaluation

TABLE 1. According to Appearance

	5	4	3	2	1
Layout of the colors, fonts, and images are consistent	28	54	16	2	
Text is clearly understandable	36	47	16	1	
Application layout is balanced and clear	27	53	19	1	

According to the evaluation that we conducted, 54 out of 100 respondents moderately agree that the layout of the colors, fonts and images are consistent throughout the application. 47 respondents moderately agree that the text is clearly understandable, and 53 respondents moderately agree that the application layout is balanced and clear.

TABLE.2 . According to Structure and Navigation

	5	4	3	2	1
The content of the application is organized	23	51	25	1	
The purpose of page is easily understood	33	49	16	1	1

The content of the application is organized and out of the 100 respondents, 51 of them moderately agree with it, which means that the structure of the application such as the placing of the buttons, arrangement of the content, and its sensitivity when navigating. While 49 of the respondents moderately agree that the purpose of the pages are easily understood, it means that the uses easily gets how does the application works.

TABLE 3. According to Content

	5	4	3	2	1
The information is correct and current	32	48	20		
The content is sufficient to meet user's needs and expectation	37	46	17		

The table shows the average rating per criteria in According to Content. 48 out of the 100 respondent moderately agree that the information of the content is correct and current, where it means that the application is consistent in giving its function as to what is expected. While 46 of them moderately agree that the content is sufficient to meet user's needs and expectations, it means that the data and information gathered according to the surveys and interviews are the same with what the application did.

TABLE 4. According to Usability

	5	4	3	2	1
All components of the application are functional	28	58	13	1	
The application is accessible for the authorized	36	49	13		2

According to usability, all components of the application are functional and 58 out of the 100 respondents moderately agreed with it, while 49 moderately agree with the usability of the application says that the application is accessible for the authorized users.

TABLE 5. According to Design

	5	4	3	2	1
User Friendliness	44	49	6	1	
Usable to the intended audience	45	44	9	2	
Simple and clear	48	44	8		

According to the evaluation that the proponents conducted, 4.36% says that our app is user friendly, 4.32% of the respondent says that the app is usable to the intended audience, and the remaining 4.4% according to the evaluation the app is so simple and clear.

Survey

TABLE 5. Daily Allowance of Senior High School Students

Allowance	Number of Respondents
50 - 100	**2**
100 - 150	**5**
150 – 200	**9**
200 – 250	**14**
250 – 300	**10**
300 – 350	**4**
More than 350	**6**

The Table 5, shows the daily allowance of the fifty respondents of the senior high school students. It shows that fourteen respondents has an allowance ranging from 200-250 pesos. While two of them have responded that they only get an allowance ranging from 50-100 pesos.

TABLE 6. Daily Allowance of College Students

Allowance	Number of Respondents
50 - 100	
100 - 150	**1**
150 – 200	**7**
200 – 250	**20**
250 – 300	**10**
300 – 350	**7**
More than 350	**5**

The Table 6, shows the daily allowance of college students. It shows that the highest number of respondents has an allowance of 200-250 pesos every day. The lowest number of respondents has an allowance of 100-150 pesos per day.

TABLE 7. Daily Allowance of Employees

Allowance	Number of Respondents
50 - 100	
100 - 150	**4**
150 – 200	**2**
200 – 250	**6**
250 – 300	**2**
300 – 350	**10**
More than 350	**26**

The Table 7, shows the daily allowance of the 50 respondents of the employees. It shows that the highest number of respondents has an allowance of more than 350 pesos per day, both the allowance of 150-200 pesos and 250-300 pesos has a total number of two respondents out of 50.

TABLE 8. Daily Budget Breakdown of Allowance of Senior High School Students

Categories	Allotted Percentage
Savings	**20%**
Meals	**40%**
Transportation	**25%**
Other Expenses	**15%**

The Table 8, shows the daily budget breakdown of allowance of the 50 respondents of the senior high school students. It shows that the highest allotted percentage of respondent's daily budget breakdown is for meals, 40% of their allowance per day, and the lowest allotted percentage of respondent's daily budget breakdown is for other expenses, 15% of their allowance per day.

TABLE 9. Daily Budget Breakdown of Allowance of College Students

Categories	Allotted Percentage
Savings	**20%**
Meals	**40%**
Transportation	**25%**
Other Expenses	**15%**

The Table 9, shows the daily budget breakdown of allowance of the 50 respondents of the college students. It shows that the highest allotted percentage of respondent's daily budget breakdown is for meals, 40% of their allowance per day, and the lowest allotted percentage of respondent's daily budget breakdown is for other expenses, 15% of their allowance per day.

TABLE 10. Daily Budget Breakdown of Allowance of Employees

Categories	Allotted Percentage
Savings	**20%**
Meals	**25%**
Transportation	**25%**
Other Expenses	**10%**
House Obligation	**20%**

The Table 10, shows the daily budget breakdown of allowance of the 50 respondents of the employee. It shows that the highest allotted percentage of respondent's daily budget breakdown is for meals and transportation, 25% of their allowance per day, and the lowest allotted percentage of respondent's daily budget breakdown is for other expenses, 10% of their allowance per day.

TABLE 11. Willingness to Download the Application

Users	Yes	No
Senior High School	**30**	**20**
College Students	**34**	**16**
Employees	**40**	**10**
Families	**32**	**18**

The Table 11, shows the willingness of the target users to download the application. It shows that the highest numbers of respondents answered yes in downloading the application.

CONCLUSION AND SUGGESTIONS

Conclusion

The proponents were able to meet the requirements needed in order to develop the application and to also satisfy the needs of the future users. The proponents were also able to upload the application in Google Play Store. Based on the conducted evaluation with the target users, the proponents conclude that they have reached the satisfaction that the users are looking for, they also succeeded in creating a budgeting application for students in senior high school and college, employees, and for the families.

The proponents were able to apply the details that they gathered from surveys and interviews to the application so that it will be appropriate for using. The application was successfully made with the use of original images, design, colors, and sounds. iPon will not only provide an educative way of budgeting, but also it will provide the user the entertaining way of budgeting with the user of their mobile phones.

Therefore, the proponents conclude that iPon can be an educational and entertainment application for the users, but there will still be more test and finalization that is needed for the stability and reliability of the application.

Suggestion

iPon can a be great recommendation for future researchers and developers that has a related objectives. However, the proponents and the future researchers should consider the use of other software that can be more useful and applicable to use, where it will be easier and not complicated to use. This software should still be related for android development and might also help them along the way. These recommendations can help with creating and improving an application with more functions and features.

Future researchers can develop an application that can perform the limitation of iPon and can also satisfy different range of users. As for iPon, the proponents are only targeting users such as students from senior high school to college, single employees that has not yet invest to anything, and a young and growing family with a total of four members only.

REFERENCE

What is Photoshop. (n.d.). Retrieved from https://itconnect.uw.edu/learn/workshops/online-tutorials/graphics-and-design-workshops/adobe-cs/photoshop/.

Mobileapplicationdevelopment.(n.d.).Retrievedfromhttps://en.wikipedia.org/wiki/Mobile_application_development.

AConceptualFrameworkforMobileLearning.(n.d.).Retrievedfromhttps://ideas.repec.org/p/amr/wpaper/464.html.

Conceptual.Framework.for.Mobile-Based.Application.(n.d.).Retrievedfrom www.irmainternational.org/viewtitle/31165/.

AdobeFlashProfessional CS6. (n.d.). Retrieved from http://www.adobe.com/devnet/flash/articles/create-first-flash-document.html.

Fearn, N. (2016, January 28). The 11 Best UK Apps for Money Management and Personal Finance. Retrieved from http://www.lifehacker.co.uk/2016/01/28/the-11-best-money-management-budgeting-and-personal-finance-apps-for-android-and-ios.

Best budgeting apps: 7 apps to take control of your finances. (2016, January 1). Retrieved from http://www.pocket-lint.com/news/135942-best-budgeting-apps-7-apps-to-take-control-of-your-finances.

By doing away in the 'accounting jargon', KashFlow has created an app for the ordinary user. (2015, May 27). Web.AppStorm. Retrieved from http://web.appstorm.net/roundups/finances-roundups/12-fantastic-finance-tracking-management-apps/.

Money Management Skills for Youth. (n.d.). Retrieved September 27, 2016, from https://www.moneymanagement.org/Financial-Education/Money-Management-For-Kids.aspx.

Foz, D. (2016, January 11). Denise Foz. Retrieved from http://blog.pawnhero.ph/15-online-tools-you-can-use-to-monitor-your-budget/.

The Philippine Online Chronicles. (2014, June 13). Retrieved September from http://thepoc.net/index.php/author/rachel-yapchiongco/.

News, A. (2014, January 12). Want to manage your finances better? Here are some apps. Retrieved from http://news.abs-cbn.com/business/01/13/14/want-manage-your-finances-better-here-are-some-apps.

5 Free Apps That Keep Your Budget In Line | MoneyMax.ph. (2015, May 08). Retrieved November 02, 2016, from http://www.moneymax.ph/blog/5-free-apps-that-keep-your-budget-in-line/.

'*LAWANG SEWU AKUNTANSI*': ACCOUNTING-BASED DIGITAL LEARNING IN ENHANCING TEACHER AND STUDENT ENGAGEMENT

Sandy Arief
Jariyah

ABSTRACT

Most accounting teachers find challenges in distributing their knowledge to their students. They face difficulties to make their students come to an understanding about the given lesson. However, traditional method of teaching fails to deliver what teachers taught. It seems to be 'out-of-date' yet boring ways to educate students. Students demand fun and enjoyable learning activity as their lifestyle led them to this habit. In one hand, there is a very impressive take-up of technology which drives us to the digital era. Thus, it may be helpful to engage sophisticated technology and fun learning in the classroom. It is 'Lawang Sewu Akuntansi' http://lawangsewuakuntansi.simplesite.com/, a fresh idea to learn basic accounting by digital learning. The idea dragged from Lawang Sewu, a cultural heritage of Semarang. The application of this digital learning media is expected to develop innovative and imaginative learning environment, stimulate eager to learn, and enhance students understanding about accounting. 'Lawang Sewu Akuntansi' also helps students to learn theoretically and conceptually about basic accounting. This knowledge eases them to receive advanced material. Moreover, teachers can easily evaluate how far the lesson perceived by their students. However, this concept requires integrated cooperation of teachers and students. Teachers have

to play their role as player, facilitator, motivator, and evaluator. Moreover, students need to put their interest and attention toward 'Lawang Sewu Akuntansi'. In conclusion, this Accounting-based digital learning can be an effective media to deliver accounting lesson in the classroom.

***Key words**: accounting, digital learning, learning media.*

INTRODUCTION

Most teachers find challenges in maintain student engagement in the classroom. Romero (2012) argued that learner's engagement in learning activities results from the combination of the learner's willingness to participate in the learning activities and the efforts the learner engages during the efficient time-on-task. He also stated that learner's engagement is dynamic and contextual. Teacher-centred or commonly known as traditional teaching method fails to optimally achieve the learning objective, yet student engagement as well. Even, traditional teaching method has often been labelled as boring for many students (McClarty et al, 2012). Boring student may lead them to drop out, as Bridgeland et al (2006) finding that about 50% high schools dropout because the classes were not interesting, and 70% of them were not motivated or inspired to work hard. Furthermore, interactive learning is more effective than traditional teaching (Dorestani, 2005).Thus, it is really crucial to develop innovative learning media for enhancing teacher and student engagement. In other hand, there is a very impressive take-up of technology which drive us to the digital era. Sophisticated technologies immerse into every aspect of life and ultimately has significant impact and shift on how educational system works. Currently, students are growing-up in a media-rich world that cannot be defined without computer and internetconnection. Today's students come to class with smart phones, laptops and iPods. They are not tool kit which they may before, but simply a lifestyle. They spend most of their times by playing computer games and internet. Consequently, teachers have better aligned their teaching style to the more up-to-date ways today's students like to learn, which is playing digital game.

Many researchers have put interest on how promising of using digital games in the learning activities. Hawlitschek and Joeckel (2017) found that playing educational game improves students' knowledge on the historical theme. They argued that game can be considered as precondition for increasing learning performance.

A similar result found by Diaz (2015). He found that exercise game improves students' performance. Similarly, Khenissi et al (2014) also found that serious game improves student's level of knowledge. Moreover, digital games contain competitive activities which conform to rules, aims, feedback, interaction and result (Ahmad and Jaafar, 2011). Apply digital games in learning activities may be challenging. However, those findings calls the stakeholder especially teachers and game designer to design digital game learning for learning activities. Whitton (2010) emphasized several features attached to educational game. First, game should align learning outcomes and the game activities itself. Second, effective educational games involve some aspect of collaboration with others. Third, pupils need to understand the purpose of the game. Based on these criteria, authors and team attempt to create helpful digital game of accounting. It is '*Lawang Sewu Akuntansi',* a collaboration of final project of IT-Based Learning Media course in Department of Economic Education, Faculty of Economics, Universitas Negeri Semarang. *'Lawang Sewu Akuntansi'* aims to enhance teacher and students engagement in the classroom. '*Lawang Sewu Akuntansi'* elaborates learning and games for accounting students regarding basic accounting lessons. In classroom settings, students that does not master the basic knowledge –in this case, basic accounting knowledge- will face more challenges to understand the advanced material.McClarty et al (2012) described that a student cannot unlock Algebra until a prerequisite knowledge of previous skill has been mastered. Therefore, playing '*Lawang Sewu Akuntansi'* may create students' best understanding of the given lessons which in turn may help them to succeed the course.

LITERATURE REVIEW

Model of Games and Learning

Garris et al (2002) creates model of learning in instructional games. Instructional content and game characteristic should be possessed by the educational games. Those features trigger a cycle, including user judgement, user behaviour, and system feedback. Games must encourage students to re-play the game by their self-motivation. In the end, repetition of the games increase understanding and led the pupils to achieve the determined learning objectives.

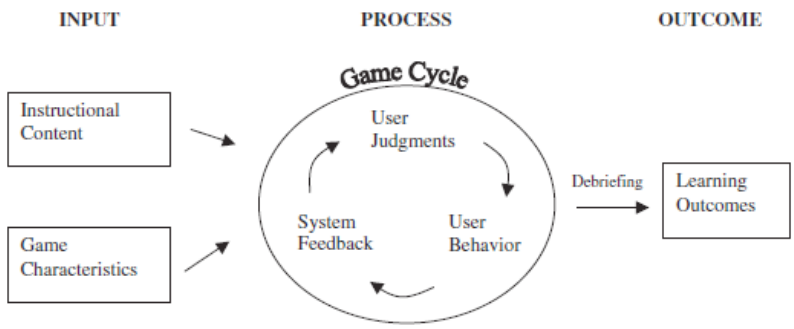


Figure 1. Input-Process-Outcome Game Model (Garris et al, 2002)

Related Works

Ahmad and Jaafar (2011) argued that computer games provide basic interactive cognitive models. It may create enjoyment. Students become able to gain cognitive and affective elements through problem solving, decision making, making conclusion and collaborative work with their peers. Moreover, games suit all students with various grades because it does not need to acquire specific knowledge to play. Computer games also helps pupils not only to understand the material but also build up their personality. Game Based Learning (GBL) can create collaborative learning and promote students engagement (Romero, 2012). In game setting, there will be intergroup competition, intragroup cooperation, and discussion of collaborative decision making. GBL foster students' communication skill and teamwork. Furthermore, game designed for collaboration process help to improve learning outcomes in intragroup GBL setting. Diaz (2015) employed active-learning exercise to help audit students understand about audit opinion. He stated that millennial students expect more innovative learning activities such as collaborative learning. Immediate feedback from others, correct misperceptions, and understand how they are thinking is important. Moreover, the results showed that exercise game improves students' performance. They perceived the exercise as enjoyable and contribute to their learning experience

Tan (2015) found that playing computer games creates excitement to the students and it is labelled as the most important value satisfied from computer games playing. In addition, pupils also sought warm relationship with others and a sense of accomplishment. Computer games provides an opportunity for learners to build a community with shared and common concern and collaborate to achieve goals. Moreover, computer games immerse learners into imaginary world and it fulfils their need of fantasy. Mercer, et al (2017) described the

advantage of using games as an approach to deliver effective education for sustainable development. Games allows learning by doing and learning by failing. Furthermore, there is no negative consequence of falling. Besides, when a student fails to accomplish the game, he will be motivated to re-play the game and it may increase his understanding towards the lessons. Games also promote knowledge, fun, entertainment and improve student engagement as well. Based on those literatures, this study aims to describe the practical implication of '*Lawang Sewu Akuntansi'* as learning media to learn accounting. Challenges also demonstrates and how far the program may success the learning activity.

METHODS

This study employs literature study approach to collect relevant information to the issue of digital games application in learning activity. The data is analysed qualitatively, there is secondary data in the form of theory, definition and discussion from literature, journals and articles. Then, the data is synthesized to theories and relevant expert opinion to get a conclusion about the implementation of '*Lawang Sewu Akuntansi'* to create innovative and imaginative learning activity.

RESULTS AND DISCUSSIONS

'Lawang Sewu Akuntansi'

'Lawang Sewu Akuntansi' is final project collaboration of IT-Based Learning Media course in Department of Accounting Education, Faculty of Economics, Universitas Negeri Semarang. The idea of '*Lawang SewuAkuntansi'* dragged from cultural heritage of Semarang, Central Java Province, Indonesia. *Lawang Sewu* literally means thousand doors, thus *Lawang Sewu Akuntansi'* has thousand doors to learn accounting. Using *Lawang Sewu* as the main idea, users of this games is driven to learn accounting in a very enjoyable ways by using 'click' in the computer and the users will be directed to 'thousand doors' just like *Lawang Sewu* to play the programs.

'Lawang Sewu Akuntansi' is not only consist of game. In the open-access website of '*Lawang Sewu Akuntansi',* at http://lawangsewuakuntansi.simplesite.com/, learners can find accounting song, accounting video, accounting puzzle and matching pictures, etc. Learning accounting is very fun by using *LawangSewuAkuntansi*. More importantly, both teachers and students can download the games and playing it both online or offline for free.

Figure 2. Home of 'Lawang Sewu Akuntansi' (Authors, 2017)

In '*Lawang Sewu Akuntansi'* game, students allows to study accounting terms and accounting cycle. Accounting terms can be learned by clicking the door of glossary, there are definition of account, types of account, and definition of specific account. In cycle, pupils can study accounting cycle, the definition of each cycle, and example of each cycle. They can understand how accounting works and see the actual example of each step. The interesting part in '*Lawang Sewu Akuntansi'* game is that students can easily evaluate their learning progress by playing exercise. Students will be directed to insert their names and choose the exercise. There are eight exercises. Each exercise group has 10 questions, consist of theoretical exercise and practical exercise. Each question has a value of 10. It is easy to play the exercise because student will only need to click on the right 'door' –in this case, each answer option is figured as a door. In the end, the score from the exercise is occurred. By this, the learners can see how far they understand the lessons and they may re-play the exercise by electing the same exercise or try other existing exercises.

Teacher may have final evaluation by using course evaluation. There are three groups of evaluation question. For the evaluation, there are 20 questions. Each question has 10 points. Students need to correctly answer 16 question with 160 point to pass the evaluation. However, there is time limit. Students have to accomplish to answer all the question for 10 minutes, or half minute for a question. If they run out of time, the remaining question is determined as

unanswered. Students allow to evaluate whether they correctly or wrongfully answer the question because after answering a question, a pop up occurred and told the learners if the answer is correct or wrong.

Figure 3. Evaluation (Authors, 2017)

Potential and Implication

Most researches argued that financial constraint occurred when educators attempt to use digital learning in the learning activity (Francis, 2006; Baek, 2008; Wastiau et al, 2009). There may be inappropriate game with learning context, lack of hardware requirement, and technical issue (Whitton, 2010). However, '*Lawang Sewu Akuntansi'* can overcome the challenges. It is free, teacher only needs internet connection to access the website and download the game. In one hand, the content of '*Lawang Sewu Akuntansi'* is aligned to learning outcomes of basic accounting course. The program does not need complex tools to play, by using computer, laptop, or smartphone the students and teachers can easily operate the game.

The potential contribution of '*Lawang Sewu Akuntansi'* to student academic success is significant. Often pupils experience boredom in the classroom from

lecturing. Thus, most students do not put their attention up on the lessons in the classroom. Digital game cope this problem by creating innovative and imaginative learning environment. McClarty et al (2012) supported this by stating that we think and understand best when we can imagine a situation and that prepares us for action. Moreover, gaming experience encourage the players to improve through repeated practice by replaying parts of a game. Fun and enjoyable learning of accounting with '*Lawang Sewu Akuntansi'* stimulates students to learn and learn. Repetition of playing games will not dragged them to boredom, besides it challenges them and in turn help them succeed the course. According to this, students gain many things from playing '*Lawang Sewu Akuntansi',* which are knowledge, fun, excitement, entertainment and their engagement to the lesson.

In higher education, '*Lawang Sewu Akuntansi* can be used in a variety of ways. It can be delivered as study resources, with or without facilitator to increase their retention of the lessons. Pupils may play it individually or collectively. In the classroom setting, teacher may introduce '*Lawang Sewu Akuntansi'* to help students understand the lessons within the course. Furthermore, playing '*Lawang Sewu Akuntansi'* is very easy and everyone can play the games. It is affordable and can be freely access on the website. Thus, practical implication is promising. Nevertheless, '*Lawang Sewu Akuntansi'* indeed demands the teachers be able as a player, facilitator, motivator and evaluator. As a player, teachers have to understand how the program works. Moreover, teachers is required to deliver instruction and direct the class as a facilitator. Motivating students is a must to ensure that students meet the learning outcomes. In the final course, evaluation is important to observe how far the lesson perceived by the students. Besides, contribution from the students by giving their engagement to the game lesson will help teachers achieve the determined learning objective.

In the end, those are the main challenge to implement '*Lawang Sewu Akuntansi'*. It is a learning media, which means that the learning success depends on how it is delivered and used. This program works best if both teachers and students collaborate in achieving the learning outcomes. However, it is teachers who contributes most. They should possess the ability to situate the learning environment. Teaching with digital gaming and lecturing is totally different. Digital game learning encourages teachers to be more active, being able to simulate the game and yet they have to maintain the whole condition of the class. Distraction may occurs and disturb the learning activities, however it can be overcome if the teachers perform their best to transfer knowledge within the game.

CONCLUSION AND SUGGESTIONS

'Lawang Sewu Akuntansi' is accounting-based learning media to enhance teachers and students engagement. It helps students understand the lessons well, progress their studying and remove boredom in learning activities as well. The program is affordable and easy to play, which ease the learning activity. However, it will be challenging for teachers because they need to be more active, being able to simulate the game and maintain the whole condition of the class. Nevertheless, it is very promising that the application of *'Lawang Sewu Akuntansi'* is effective to deliver accounting lessons in the classroom. Accounting teachers may consider to use *'Lawang Sewu Akuntansi'* for learning activities. It is also recommended that game designer develops this program for advanced accounting because *'Lawang Sewu Akuntansi'* is limited to basic accounting course. This study uses description approach, and thus empirical evidence on how *'Lawang Sewu Akuntansi'* helps in improving students' performance has to be revealed. Therefore, future research may explore quantitatively about the effect of *'Lawang Sewu Akuntansi'* in accounting class.

REFERENCE

Ahmad, J., &Jaafar, A. (2011). Computer Games: Implementation into teaching and learning. *UKM Teaching and Learning Congress 2011.*

Baek, Y. K. (2008). What hinders teachers in using computer and video games in the classroom? Exploring factors inhibiting the uptake of computer and video games. *Cyber Psychology and Behaviour,* 6, 665-671.

Bridgeland, J. M., Bilulio, J. J., & Morison, K. B. (2006). The silent epidemic: Perspectives of high school dropouts. Retrieved from http://www.ignitelearning.com/pdf/TheSilentEpidemic3-o6FINAL.pdf.

Diaz, M. C. (2015). Assembling the opinion: An active learning exercise for audit students. *J. of Acc. Ed,* retrieved from http://www.doi.org/10.1016/j.jaccedu.2015.12.001.

Dorestani, A. (2005). 2005). Is Interactive/Active Learning Superior to Traditional Lecturing in Economics Courses?*Humanomics*, 21(1), pp.1-20, retrieved from https://doi.org/10.1108/eb018897

Francis, Russell. (2006). Towards a Theory of a Games Based Pedagogy. *JISC Innovating e-Learning 2006: Transforming Learning Experiences Online Conference.*

Garris, R., Ahlers, R., &Driskell, J. E. (2002). Games, Motivation and Learning Simulation & Gaming: An Interdisciplinary Journal Practice and Research, 33(4).

Hawlitschek, A., Joeckel, S. (2017). Increasing the Effectiveness of Digital Educational games: The Effect of a Learning Instruction on Students' Learning, Motivation and Cognitive Load. *Computer in Human Behavior.* Retrieved from https://doi.org/10.1016/j.chb.2017.01.040.

Khenissi, M. A., Essalmi, F., &Jemni, M. (2014). Comparison between Serious Game and Learning Version of Existing Games. *Procedia- Social and Behavioral Science 191,* 487-494.

McClarty, K. L., Orr, A., Frey, P. M., Dolan, R. P., Vassileva, V., &McVay, A. (2012). A Literature Review of Gaming in Education. *Research Report of Pearson.*

Mercer, T. G., Kythreotis, A. P., Robinson, Z. P., Stolte, T., George, S. M., &

Haywood S. K. (2017). The use of educational game design and play in higher education to influence sustainable behavior. *International Journal of Sustainability in Higher Education*, 18(3), pp.359-384, retrieved fromhttps://doi.org/10.1108/IJSHE-03-2015-0064

Romero, M. (2012). Learner Engagement in the use of Individual and Collaborative Serious Games, in Charles Wankel, Patrick Blessinger (ed.).*Increasing Student Engagement and Retention Using Immersive Interfaces: Virtual Worlds, Gaming, and Simulation (Cutting-edge Technologies in Higher Education, Volume 6 Part C)* Emerald Group Publishing Limited, pp.15 - 34

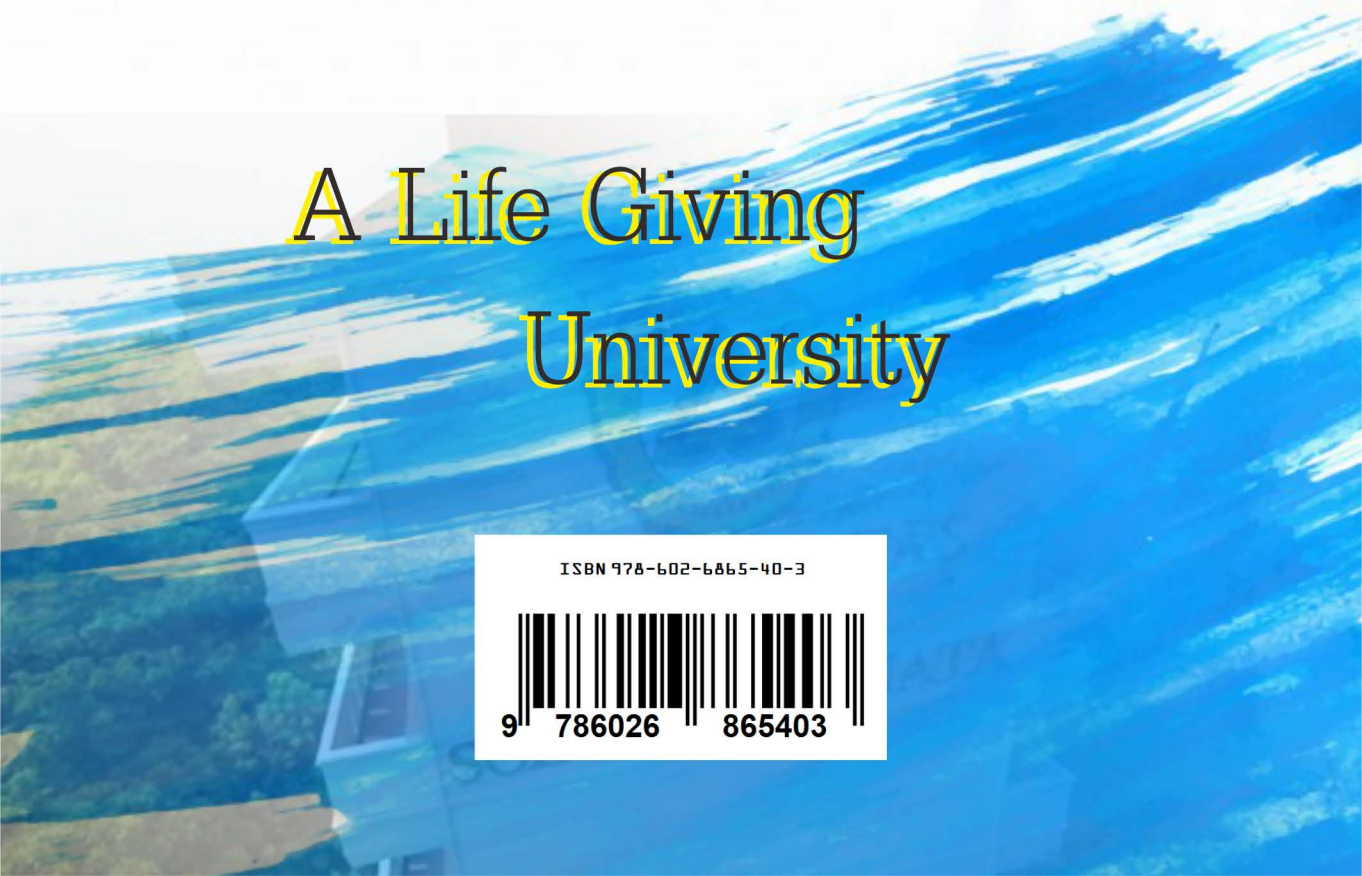
Tan, W. L. (2015). Strategies for Designing Engaging E-learning Instructions: Know your Learners' Need, in Charles Wankel, Patrick Blessinger (ed.).*Increasing Student Engagement and Retention Using Immersive Interfaces: Virtual Worlds, Gaming, and Simulation (Cutting-edge Technologies in Higher Education, Volume 6 Part C)* Emerald Group Publishing Limited, pp.35 - 63

Wastiau, P., Kearney, C. & den Berghe, W., V. (2009). *How are digital games used in schools?* Retrieved from http://games.eun.org/upload/gis-synthesis_report_en.pdf.

Whitton, Nicola. (2010). *Learning with Digital Games: A Practical Guide to Engaging Students in Higher Education*. New York: Routledge.

Unika
SOEGIJAPRANATA

Talenta pro patria et humanitate



A Life Giving University

ISBN 978-602-6865-40-3