Simulation and Project Based Learning for Developing Creativity: From Classroom to Real Life

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Abstract This research aimed to evaluate media advertisement (car decoration) produced by students and to study their satisfaction on learning to produce media advertisement (car decoration) products by using MediaAd Simulation and project based learning. The subjects included 90 third year students who registered on the interface design course at the Department of Multimedia, Bansomdejchaopraya Rajabhat University. The research instruments included focus group discussion guidelines, the interview, and the evaluation form of the media advertisement products developed. Data were analyzed by using content analysis. The results revealed that of 180 media advertisement products, 35 products were at the high level, 98 products were at the middle level, and 47 products were at the low level. One product won the prize in the contest. Students expressed that they were satisfied with this project because they gained knowledge, skills, and experiences from learning by using project based learning (PBL) and the MediaAd Simulation because the contest motivated them to work harder and more meticulously.

Keywords: content analysis, debrief, evaluation, focus group, media advertisement product.
Introduction

“Imagination is more important than knowledge. For knowledge is limited to all we now know and understand, while imagination embraces the entire world, and all there ever will be to know and understand”, said Albert Einstein, a German-born theoretical physicist, a world renown scientist, and most teachers and educators agree. This is because imagination fosters humans to think, create, and develop new things, new medicine, or new technology. Students will have imagination when they are trained to think logically, critically, creatively, collaboratively, and independently. “Creativity is the process of bringing something new into being. Creativity requires passion and commitment. It brings to our awareness what was previously hidden and points to new life. The experience is one of heightened consciousness: ecstasy.”—Rollo May (1975), The Courage to Create. “A product is creative when it is (a) novel and (b) appropriate. A novel product is original but not predictable. The bigger the concept, and the more the product, stimulates further work and ideas, the more the product is creative.”—Sternberg and Lubart (1995), Defying the Crowd.

However, the research results reveal that the children have high creativity when they are in kindergarten, but their creativity decreases gradually after they study higher and higher. Sir Ken Robinson (1998), chair of the UK Government’s report on creativity, education and the economy, stated that “young people lost their ability to think in ‘divergent or non-linear ways’, a key component of creativity. Of 1,600 children aged three to five who were tested, 98% showed they could think in divergent ways. By the time they were aged eight to 10, 32% could think divergently. When the same test was applied to 13 to 15-year-olds, only 10% could think in this way. When the test was used with 200,000 students who were 25-year-olds, only 2% could think divergently. Education is driven by the idea of one answer and this idea of divergent thinking becomes stifled. He described creativity as the ‘genetic code’ of education and said it was essential for the new economic circumstances of the 21st century.” (Buie, 2005).

Teachers as professional and important persons need to plan well for the whole curriculum to equip and foster their students to have creativity by training higher order thinking skills which are critical and creative thinking for their students. Teachers may choose
issues, tasks, and challenges and ask students to brainstorm, discuss, and reflect to find the best way to solve problems or to create new or innovative products. Students will gain higher order thinking skills by using different strategies gradually from both learning and real life contexts. Therefore, this study was conducted to help students to use higher order thinking skills by using MediaAd Simulation and project based learning. Teachers used media advertisement simulation as a tool to train their students while students gain their critical and creative thinking by creating their logos via Project Based Learning (PBL).

Thus, two research objectives were posed:
1. To evaluate the media advertisement products produced by students
2. To study their satisfaction on learning to produce media advertisement products using project based learning, MediaAd simulation, and creativity.

Artists need to be trained to be able to construct media advertisement, so they can build up and embrace their knowledge and skills which combined arts and computer technology together for producing modern, attractive, and international media. Therefore, the researchers used project based learning (PBL), simulation, and creativity approaches to guide students.

Project-Based Learning (PBL) is one of activities which help students to engage in using higher order thinking skills. “Project based learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to a complex question, problem, or challenge.” (http://bie.org/about/what_pbl, 2015). Essential elements of PBL include the following. (1) Teachers select significant content, so most important knowledge and skills or standards and key concepts are emphasized for teaching. (2) Teachers build and establish 21st century competencies for students such as problem solving, critical thinking, collaboration, communication, and creativity/innovation. (3) Students use in-depth inquiry to expand their knowledge and skills by asking questions, using resources, and developing answers. (4) Teachers and students choose projects which benefit for society to drive question for exploration and work. (5) Students see and realize what they need to
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know in order to gain knowledge, understand concepts, and apply skills in order to answer the driving question and create project products. Thus, the project must be attractive and curious. (6) Students had voice and choice, so they decide the goals, the product, and the process by themselves with the help and guide from their teachers. (7) Teachers and students provide critique and revision, so the project, both in terms of process and product, can be improved to have high final quality. (8) Students present their outcomes or products from those PBL projects to public audiences. (http://bie.org/about/what_pbl, 2015). To summarize, students get an idea, design the project, tune the project, do the project, and exhibit the project (Patton & Robin, 2012).

**Simulation-Based Learning (SBL)** is one of teaching techniques and a learning tool which the real situations are used as a model for students to learn and practice. Moreover, “simulation-based learning can be the way to develop health professionals’ knowledge, skills, and attitudes, whilst protecting patients from unnecessary risks”, stated Lateef (2010). As a model, mostly some of real situations are chosen for working in simulation, but the simulator needs to represent and replicate tasks of sufficient reality and serve the desired purposes of learning (Gaba, 2004). Robert Gagne specified crucial elements of simulation that “a simulation for learning represents a real situation in which operations are carried out, provides the user with certain controls over the problem or situation, and omits certain distracting variables irrelevant or unimportant for the particular instructional goals. Simulation = (Reality) - (Task irrelevant elements)” (Robert Gagne, 1962 cited in Lunetta & Avi, 1981, p. 242). According to Salas et al. (2008) the key components of simulation-based training are as follows: performance history/skill inventory, tasks/competences, training objectives, events/exercises, measures/metrics, performance diagnosis, and feedback and debrief. A study of a critical review of simulation-based medical education research: 2003–2009 addressed that simulation-based learning in medical education which enhance learning included feedback; deliberate practice; outcome measurement; simulation fidelity; skill acquisition and maintenance; mastery learning; transfer to practice; team training; high-stakes testing; instructor training, and educational and professional context (McGaghie, Issenberg, Petrusa, & Scalese, 2010). To conclude,
students gain some learning experience by simulation-based learning.

**Creativity:** “Education has a dynamic relationship with this shifting world of employment and the wider economy. Accordingly, what is considered significant in terms of educational achievement is changing. For it is no longer sufficient to have merely excellence in depth and grasp of knowledge. Creativity is critical to surviving and thriving.” (Craft, 2006, p. 20). Academic and professional contexts need to link strongly to build up creativity and broader competences of students by integrating into intended learning outcomes, teaching and learning activities, and assessment tasks (Cheung, 2011). To embrace creativity, students need to be trained to use higher order thinking skills such as critical, analytical, and creative thinking skills (Gustina & Sweet, 2014). The goal of creativity is to build or invent new things, to use new processes, or to put new thought or new ideas which have not been done before, and these new things, new processes, or new thought make products or services better than before i.e. “the outcomes must be both original and value” (NACCCE report, 1999, p.31). Teachers need to select, organize, and plan activities specifically and carefully for students to engage in creativity. These activities should include group work for students to collaborate and individually for students to be independent and entail some sort of transition or tension between ways of thinking. Moreover, those activities must be challenging and engaging to students to: (1) think logically and reasonably, (2) listen to and accept other opinions, (3) seek for other alternatives or solutions so their imagines are possible, and (4) be innovative risk-takers. Therefore, critical and creative thinking should be addressed through the learning areas, so students will have chances to add depth and richness learning in content elaborations and gain learning experiences (both in class and out of class) where are imaginative, creative, stimulating and challenging (Cheung, 2011; NACCCE report, 1999). Student creativity is currently attracting considerable attention. An increasing number of high schools in China are trying to improve the learning motivation and creativity of students, as well as the teaching efficiency of creative design, by introducing augmented reality (AR) technology into creative design courses (Xiaodonga, Dongdongb, Yueb, &
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Yongtiana, 2015). In short, to success in this era, students need creativity so they can establish new efficient processes or products.

In this study, three approaches: project based learning (PBL), simulations, and creativity were integrated and used as conceptual framework. See Diagram 1.

Students use critical thinking to analyze the problems stated. Then they worked as a group of creative staff to share their thought of creating media advertisement before create their own pieces. Teachers selected and sequenced significant contents, activities, and tasks to train students. Students decided and designed their media advertisement and shared with their group to receive comments and suggestions (peer review) for improving their work. Then after correction their work, students submit their work to teachers to receive comments and suggestions (teacher review) and students took them for improving their work. Finally, the pieces of media advertisement were submitted to PTT Public Company Limited for contest. After the contest results were announced, both teachers and students did debrief.
Methods

**Informants**: The informants in this particular research included twelve faculty members who worked and 90 third year students who registered on the interface course at the Department of Multimedia, Bansomdejchaopraya Rajabhat University. All students of this course were subjects in this study. Six informants were randomly selected for the interview.

**Research Design**: This research was divided into three phases. *First*, situational analysis was done by literature review, meeting, and discussion with twelve faculty members who worked at the Department of Multimedia at the University. At the meeting, the researcher reported the work needed by the Academic Service Department. Then all faculty members were asked to discuss and suggest what and how to increase both quantitative and qualitative products. Three projects were proposed and only one was selected which was to submit students’ products to win awards. The faculty members sought for the contests and they chose the PTT project, offered by the *PTT Public Company Limited*, which invited students to design media advertisement products for competition. *Second*, the model for developing the media advertisement products and the teaching technique which was used as a tool to create media advertisement products was developed based on focus group discussions of faculty members. The model included: problem analysis, design, application, and evaluation. *Third*, the MediaAd Simulation was implemented with 90 third year students who registered on the interface course at the Department. Their media advertisement products were evaluated and improved.

**Research Tools**: Two research tools were used in this study: an experimental tool (MediaAd simulation) and data collection tools (focus group discussion guidelines, the interview, and the evaluation form of the logo). Details are shown below.
MediaAd: Integration of Simulation and Project-based Learning

**MediaAd simulation**

*Purpose*: (1) To provide learning experiences of arts for students to design and produce their work based on clients’ need and wants, and (2) to submit students’ products for contest.

*Devices*: An experimental tool: MediaAs simulation and project base learning and evaluation forms.

*Roles*:

1. **Chief of creative staff**: Students in each group chose one student to be the chief of their team. Each needs to provide reason for choosing the person.

2. **Creative staffs**: The rest worked as members.

*Rules*:

1. Chief leads the meeting.

2. A member of the group volunteers to be the secretary.

3. Chief and members search for and identify the requirement of the contest.

4. Group chooses one contest to produce media advertisement contest.

5. Group has a meeting to plan, design, produce, evaluate, improve, and submit media advertisement products to the contest.

*How to play*: To do this MediaAd simulation, (1) students were told objectives and goals of this study and asked them to participate in the project. (2) Teachers armed them with theories of theories of design, elements of arts, and some distinguish examples. (3) Students worked in a group of five to
form a creative team for an advertisement company. (4) Students were supposed to be creative staff and worked with their group to create their own media advertisement products for each creative staff. (5) Students had to plan by following the model: problem analysis, design, application, and evaluation. (6) Creative staff submitted their media advertisement products to teachers who acted as their customers. (7) These customers evaluated media advertisement products, and provided comment and suggestions for creative staff to modify their media advertisement products. (8) After receiving the corrected media advertisement products created by the students, the faculty members reevaluated. (9) Teachers asked all students to submit their media advertisement products to the contest. Finally, (10) students debrief their learning from using the MediaAd Simulation.

Data collection instruments: The research instruments included focus group discussion guidelines, the interview, and the evaluation form of the advertisement media developed by the researchers. See Appendix A.

Criteria for evaluating advertisement media: The products were evaluated in 2 main success criteria and 5 sub- success criteria:

1. Advertisement concept

(a) Development of a concept design for an advertisement

(b) Demonstration of an awareness of the target audience

2. Oral presentation

(a) Relevant and appropriate content

(b) Appropriate structure of the presentation

(c) Effective skills of oral presentation

See Appendix B.
Procedures for Data Collection

To collect data, the researchers followed the following 3Ps steps: Preparation, Presentation, and Production. Then the products were submitted for competition, and students and teacher debrief.

1. Preparation: This phrase included asked for permission, search for the contests, analysis the contest, and team building. (1) The researchers asked for permission to conduct the study from the Faculty of Social Science and Humanities. After receiving permission, on the first week, teacher told students objectives and goals of this study and asked them to participate in the project. All of them agreed. (2) Then the teachers and students tried to find the contests from the Internet and other modes such as television, radio, and newspaper. (3) The teachers and students sought for information of the cars such as basic functions of the cars, goals of car design, target clients, competitor, reasons behind car design, and sketch. Then both teachers and students analyzed the goals and products of the contest to see the possibility of accomplishment both products and win. (4) Finally, both teachers and students agreed to compete in the “Toyota Car Decoration Contest”. In this contest, students had to design Toyota cars: Yaris and Vios which showed new and modern ideas, and Toyota Company called this project “Young and Sporty Vehicle for New Generation”. See advertisement below.
2. **Presentation**: Teachers explained the procedures and theories of design and elements of arts as well as provided examples to students.

3. **Production**: Each student had to design for both type of cars by simulating that they were creative staff. Students used special software owned by Toyota Company to create their products. When they completed their designs, students had to save as their print screen, submit, and present to class in the tenth week of the first semester. Teacher evaluated and provided comments to these advertisement media. Students corrected their advertisement media and resubmitted in the fourteenth week of the first semester. The researcher reevaluated and students corrected and improved.

4. **Competition**: After students completed their products, all products were submitted to the “*Toyota Car Decoration Contest*” through the website of Toyota directly.

5. **Debrief**: The researcher and the teacher did debrief. The teacher also interviewed students on the satisfaction of learning from using the MediaAd Simulation in the fifteenth week of the first semester.

**Data analysis**: Data were analyzed by using content analysis. Data from open-ended questions were then transcribed verbatim and grouped to explore satisfaction of students.
Results

Two results were presented below.

1. Results of evaluation advertisement media are details below.

1.1 Peer evaluation: Members of each group shared their products and provided comments and suggestions to the products of their peers.

1.2 Teacher evaluation: After students corrected and improved their products, they submitted them to their teachers. Teachers used “Teacher rubric for advertisement task” to evaluated students’ products. Teachers classified the products into three groups: high, medium, and low because time limited and there were many products. See Table 1. Teachers asked students to correct and improve their products, and finally, to submit all products to Toyota Contest. See examples of MediaAd created by students in Table 2.

Table 1: Number and Percent of Classification of Products
<table>
<thead>
<tr>
<th>Classification of Products</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>35</td>
<td>19.44</td>
</tr>
<tr>
<td>Medium</td>
<td>98</td>
<td>54.44</td>
</tr>
<tr>
<td>Low</td>
<td>47</td>
<td>26.11</td>
</tr>
<tr>
<td>Total</td>
<td>180</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Table 2: Examples of MediaAd Products**

A. Low quality of MediaAd Products

B. Medium quality of MediaAd Products

C. High quality of MediaAd Products
1.3 Contest result: The contest result revealed that one student won and got the reward.

2. Results of satisfaction on learning to produce advertisement media using project based learning and MediaAd Simulation

Six students were interviewed and stated that they were satisfied with learning by using project based learning (PBL) and the MediaAd Simulation to create advertisement media because they gained benefits as follows.

2.1 Knowledge, skills, and experiences: Five students stated explicitly that they gained knowledge, skills, and experiences from learning by using project based learning (PBL) and the MediaAd Simulation because the contest motivated them to work harder and more meticulously. For examples, the first said, “The contest enhanced my learning and in making the products, I have to pay more attention to my work because if I win, I will get reward”. Another explained, “After I got the reward as the winner, I have a chance to join the workshop provided by the contest organizer and I learned a lot because the speakers and trainers are at the national level. Some even showed their products in Kann, Germany. Moreover, I knew my position or my competitor position.” A third
student said, “Of course, I have very good and rich experiences from both PBL, simulation, and the contest.”

2.2 Independent learners: Students have opportunities to work as a group, so they learned and used communication skills. They also work individually to create their original work. For examples, one explained, “I work with my friends, and they give me useful comments. I learn and gain knowledge and experience out of my class. I practice to think creatively. My dream is to be creative guys internationally. Now I achieved at about 20%, and I will continue. I will go to the next contest.” Another described “I fell more confident after I competed the contest and I am also very proud of myself that I can make it.” The third said, “...at least I got the reward...” The fourth added, “This project is really good because I develop my design skills. The contest and the reward have been stated on my track record. I will continue to develop my design skills.”

Discussion

1. Evaluation advertisement media: This project corresponds to a critical review of simulation-based medical education research: 2003–2009 (McGaghie, Issenberg, Petrusa, & Scalese, 2010), Patton& Robin (2012) and Craft (2006). Teachers used Project-Based Learning (PBL) and Simulation-Based Learning (SBL) to prepare, encourage, and practice students to use their future professional skills and the highest goal was to create original products. After students produced their products, both students and teachers evaluate the media advertisements. Students have chances to learn from their peer and teachers and get information to improve their works. Then students submitted their final products to Toyota Company for competition i.e. students present their outcomes or products from their PBL projects to public audiences. This process connects education to business which is the real world where things are complex question, problem, or challenge. Moreover, some students got reward and continue to learn deeper and wider in their area. Thus, it can be concluded that students have sufficient knowledge and skills in their career as well as their creativity to surviving and thriving in their future career.
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2. Satisfaction on learning to produce advertisement media using project based learning and MediaAd Simulation: According to the results of this study, students were satisfied with this study which offered three approaches for them to create their new products. They had chances to learn, practice, and experience the real situation.

Limitation of the study and suggestion for further research: This study is a classroom research and tried to fill the lack of the Department, so the goal is to get the reward. Contextually, any of our students must not be left out because all of them need to have this experience, so no sampling was done. The research did not provide pre-test and post-test before and after conducting this project, so an explicit evidence of knowledge gain from this study was not reported. The next study may offer the tests so mean scores of pre-test and post-test can be compared.

Conclusions

Creativity is crucial for students and professions because creativity connects education to economy or business. Project-based learning and simulations-based learning approaches may be used to help learning and teaching of a subject to reach creativity which students can make new products or processes.

References


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Appendix A

Focus group discussion guidelines

Faculty Meeting: The program has to get scores for education accreditation in the topic of “students get reward at the national level”. As the Department Chair, I would ask for your cooperation to brainstorm how we can do.

Interview guidelines

1. How do you get satisfaction in learning by using project based learning (PBL) and the MediaAd Simulation to create advertisement media? Please explain.

2. What did you gain or learn from using project based learning (PBL) and the MediaAd Simulation to create advertisement media in terms of Knowledge, skills, and experiences? Please explain.

3. How does learning by using project based learning (PBL) and the MediaAd Simulation to create advertisement media help you to be independent learners? Please explain.
## Teacher rubric for advertisement task

<table>
<thead>
<tr>
<th>Success criteria</th>
<th>Indicators of student performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td><strong>Medium</strong></td>
</tr>
<tr>
<td>Advertisement concept (a) Development of a concept design for an advertisement</td>
<td>Presents advertisement as concept design, including sketch and detailed labelling.</td>
</tr>
<tr>
<td>(b) Demonstration of an awareness of the target audience</td>
<td>Employs a range of strategies highly appropriate for the target audience of the advertisement, e.g. choice of language, images, and persuasive techniques.</td>
</tr>
<tr>
<td>Oral presentation (a) Relevant and appropriate content</td>
<td>Clearly explains use of persuasive strategies with close reference to text and image, product and target audience.</td>
</tr>
<tr>
<td>(b) Appropriate structure of the presentation</td>
<td>Shows evidence of having planned and structured the presentation logically and coherently. Demonstrates a consistent awareness of the audience for the oral presentation, e.g. by actively promoting the concept advertisement and seeking to convince the audience of its effectiveness. Uses body language (eye contact, posture, gestures) appropriately and effectively to enhance and support speech.</td>
</tr>
<tr>
<td>(c) Effective skills of oral presentation</td>
<td>Speaks clearly and accurately, and at an appropriate volume and pace.</td>
</tr>
</tbody>
</table>
Comments:

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(Source: www.assessmentforlearning.edu.au)