The use of e-learning tools in blended learning approach on students’ engagement and performance

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Abstract. Industry 4.0 offers new opportunities in teaching and learning with the emergence of new ideas and technology. Face-to-face instruction becomes an obsolete method and does not cater to the needs of millennial learners. Distance learning is not widely adopted by schools in third world countries. Thus, school policies, facilities, and teacher is not yet ready to adapt full online learning instruction. However, Blended learning mediates the transition of face-to-face and online learning approach. This study examines the 180 senior high school students in Science, Technology, Engineering and Mathematics Strand on their perception on the use of eLearning tools and the impact of blended learning on their learning process. This study used the descriptive correlational design using a questionnaire in gathering data. Results show that respondents preferred the blended learning approach for its flexibility in accessing content online and highly adept in using digital devices. The use of eLearning tools is highly engaging and efficient; however, blended learning model has a moderate impact on students’ performance in doing activities online.

1. Introduction

Industry 4.0 offers new opportunities in teaching and learning with the emergence of new ideas and technology. Face-to-face instruction becomes an obsolete method and does not cater to the needs of millennial learners. Distance learning is not widely adapted by schools in the third world countries. Thus, school policies, facilities, and teacher is not yet ready to adapt full online learning instruction. However, Blended learning mediates the transition of face-to-face and online learning approach. The use of face-to-face instruction and computer mediated or online learning is called Blended learning [1], [3], [4], [5], [6]. These two can form a synergistic integrated instructional approach. With eLearning, teachers become coach, facilitator and planner of learning activities while learner became a researcher for information, pro-active and effective in the teaching-learning process. New outlook for educators and learning spaces need in the teaching and learning process as a means of delivering material, direct student interaction and communication by integrating technological progress. Blended Learning really becomes an opportunity to provide differentiated self-paced instruction for individualized and
personalized student learning because technology and teacher are working together [2], [3], [7]. Blended learning has four different concepts: (1) to combine or mix modes of web-based technology to accomplish its educational goal (2) to combine various pedagogical approaches to produce an optimal learning outcome with or without instructional technology (3) to connect any form of instructional technology with face-to-face instructor-led training, and (4) to mix or combine instructional technology with actual job tasks to create a harmonious effect of learning and working [8], [9].

This research described the impact of blended learning to the senior high school students of the Integrated Developmental School on their performance. The Integrated Developmental School (IDS) is the laboratory school of the College of Education (CED). Considered the basic education department of Institute. It has two levels: Junior High School (Grades 7-10) and Senior High School (Grades 11-12). The program is focus on Mathematics and the Sciences. Teachers in the senior high school department has implemented Blended learning. The researchers would like to evaluate the Blended Learning Model by IDS, which focus on measuring the students’ perceptions at the blended learning environment concerning its productiveness; the students’ performance on blended learning approach characterizes how the eLearning devices assist students with their learning and how capable they are in managing the eLearning tools. In this paper, examines the respondents profile to the efficiency, engagement and learning process in blended learning mode. Using a descriptive correlational design, this study assessed the respondents’ perception and its impact of blended learning mode to their performance in the learning activities in contrast to their strands.

1.1 Statement of the Problem

This study aimed to determine the Impact on Blended Learning Approach among Senior High School Students in the Science laboratory school. Specifically, it sought to answer the following questions:

1. What Blended Learning Model do students prefer for their course? Why?
2. How does e-learning tools and technology for education engage students in the learning process?
3. What is the impact of blended learning to the respondents’ performance?
4. Is there a significant relationship between the profile of the respondents and the impact of blended learning approach to students’ performance in terms of efficiency, engagement and learning process?

1.2 Null Hypothesis

Ho: There is no significant relationship between the profile of respondents and the impact of blended learning approach to student’s performance in terms of efficiency, engagement and learning process.

2. Methodology

2.1 Research Design

This study utilized the descriptive correlational design in gathering data by correlating respondents profile to the effects of eLearning tools to students’ engagement, and blended learning model on students’ performance in doing learning activities.

2.2 Participants

The respondents of this study are the 180 Senior High School Students enrolled in the Institute Laboratory Science High School. Purposive selection of the participants enrolled in a blended learning mode subjects were the respondents of the study. Validation of Blended courses should be the availability of the course in the Online Learning Environment (MOLE). The Integrated Developmental School (IDS), a laboratory school of the College of Education, which offers two
tracks: the Academic Track and the Technical-Vocational Track. The Academic Track has certain strands; one of which is the STEM which offers three section for grade 11 and two section for grade12, 3 HUMS which offers 1 section for grade 11 and 1 section for Grade 12, and last, ABM which offers 2 sections for grade 11 and 12.

| Strands    | No. of Students |
|------------|-----------------|
| Grade 11 HUMSS | 33              |
| Grade 12 ABM | 35              |
| Grade 11 STEM | 56              |
| Grade 12 STEM | 56              |
| **Total** | **180**         |

2.3 Research Instruments

Researchers used a revised questionnaire to gather data. The first Part of questionnaire is composed of the respondents’ demographic profile consisting of age, sex, and subject strands. Part 2 shows the students choice of blended learning mode and the reasons of the choice. The third part is an 11-item test to assess the e-learning tools used by the students. Statements are rated on a scale of 4 (Very Adept) to 1 (Not Adept). Part IV will assess how eLearning tools engage students to learn. Statements are rated from 4 (Strongly Agree) to 1 (Strongly Disagree). Part V evaluates the impact of blended learning to students’ performance in the learning process. Statements are rated on a scale of 4 (Very Adept) to 1 (Not Adept). Part IV assess how e learning tools engage students. Statements are rated from 4 (Strongly Agree) to 1 (Strongly Disagree). The last part of the questionnaire is composed of two parts.

2.4 Procedures

Data gathering was conducted during the first semester of the school year 2018-2019. The students from the laboratory school was chosen because it has an Institute Online Learning Environment called MOLE. It is an online learning platform like Moodle, where teachers can post and create learning activities and handouts, communicate with students, create online quizzes, compute grades, and upload offline videos and link online readings. Instructions and purpose of the study were explained during the data gathering. Students were informed of their rights with utmost full confidentiality.

2.5 Data Analysis

The Statistical Package for Social Science known as SPSS was used to analyze the data with the following statistical treatment: Descriptive statistics and Pearson R were applied to show the interrelations between the different research variables.

3. Results

3.1 Students Profile

Students profile. Majority of the participants are in the age of 17 (47%) who are female (58%), belong to Science, Technology, Engineering and Mathematics (62%) strand, and having 20,000 to 30,000 monthly family income (33%).
1. **What Blended learning Model do students prefer for their course? Why?**

Out 180 students, 118 (52%) chose 50% face-to-face and 50% Online Activities while there are only four (2%) students preferred full online blended learning model, 53 (23%) on minimal use of the Web, 13 (6%) on extensive use of the Web respectively.

Table 1. Reasons of Students in Choosing the Blended Learning Model, N=180

| Reasons… | Number of Responses | Percentage |
|----------|---------------------|------------|
| I can access online content anytime and anywhere | 117 | 65% |
| I have interactive and valuable experience | 107 | 59% |
| I can study my lesson anytime and anywhere | 96 | 53.3% |
| I can access variety of online resources | 82 | 45.5% |
| I choose based on the preference of instructor | 70 | 38.8% |
| It can study in a virtual environment and use online applications | 67 | 37.2% |
| I prefer technology use in class | 47 | 26.1% |
| I have no choice because since subject are implemented in a blended learning approach | 17 | 9.4% |

Table 1 shows that there are 117 (65%) students who chose blended learning because they could access online content anytime and anywhere, and 107 (59%) chose interactivity and valuable experiences while enrolled in the blended learning mode subjects. However, only 17 (9.4%) chose that they do not have any choice all since the subject is implemented in a blended learning approach.

2. **How does e-learning tools and technology for education engage students in the learning process?**

Table 2. Students Level of Capability to Use eLearning tools for learning

| Personal Devices                  | Mean   | SD    | Interpretation | Description       |
|-----------------------------------|--------|-------|----------------|-------------------|
| Mobile Phone                      | 3.59   | 1.42  | Very Adept     | Very Efficient    |
| Laptop                            | 3.57   | 1.63  | Very Adept     | Very Efficient    |
| Desktop Computer                  | 3.55   | 1.12  | Very Adept     | Very Efficient    |
| Tablet/ Ipad                      | 3.04   | 0.69  | Adept          | Efficient         |
| Netbook                           | 2.54   | 0.43  | Adept          | Efficient         |
| MacBook                           | 2.41   | 0.37  | Somewhat Adept | Somewhat Efficient|
| **Total**                         | 3.21   | 0.91  | Adept          | Efficient         |

| Social Networking Application     | Mean   | SD     | Interpretation | Description       |
|-----------------------------------|--------|--------|----------------|-------------------|
| Google Apps                       | 3.45   | 1.078  | Very Adept     | Very Efficient    |
| Youtube                           | 3.36   | 0.932  | Very Adept     | Very Efficient    |
| Gmail                             | 3.18   | 0.741  | Adept          | Efficient         |
| Facebook                          | 3.12   | 0.683  | Adept          | Efficient         |
| Messenger                         | 3.07   | 0.666  | Adept          | Efficient         |
| Edmodo                            | 2.98   | 0.716  | Adept          | Efficient         |
| MSU-IIT Online Learning Environment (MOLE) | 2.77 | 0.494  | Adept          | Efficient         |
| **Total**                         | 3.13   | 0.759  | Adept          | Efficient         |

Table 2 shows that student are Adept on the use of eLearning tools to student learning process. However, Mobile Phone (M=3.59, SD 1.42), use of Laptop (M=3.57, SD=1.63) and Desktop Computer (M=3.55, SD= 1.12) were the common available personal devices the students
frequently used. On the other hand, “Google Apps” (M=3.45, SD=1.078), and “YouTube” (M=3.36, SD=.93) are the Social Network Application used as eLearning tools students are very adept with. This is because of the availability of Internet Connection, the campus where the students can have access on google applications once students open their emails in myIIT account, and the devices is very convenient and affordable to use.

Table 3. Students’ engagement with the Use of E-learning tools for Education, N=180

| Indicator                                                                 | Mean | SD   | Interpretation | Description          |
|---------------------------------------------------------------------------|------|------|----------------|----------------------|
| Blended learning allows me to access global resources and materials that meets my level of knowledge and interest | 3.48 | 0.96 | Strongly Agree | Highly Engaging      |
| Blended learning allows me to utilize technology/Applications in my studies | 3.46 | 0.94 | Strongly Agree | Highly Engaging      |
| Blended learning allows me to multitasking                                | 3.43 | 0.91 | Strongly Agree | Highly Engaging      |
| Blended learning offers flexibility in terms of my availability- anytime, anywhere | 3.42 | 0.92 | Strongly Agree | Highly Engaging      |
| Blended learning allows me to practice technology purposely                | 3.41 | 0.87 | Strongly Agree | Highly Engaging      |
| I can easily do my homework in the blended learning                       | 3.28 | 0.83 | Strongly Agree | Highly Engaging      |
| Blended learning allows me to work independently                          | 3.21 | 0.86 | Agree          | Engaging             |
| Blended learning expands my learning time                                  | 3.16 | 0.83 | Agree          | Engaging             |
| Blended learning enhances my meaningful learning experience and prepares me for real life encounters | 3.13 | 0.71 | Agree          | Engaging             |
| Blended learning provide me an instruction that matches my skill          | 3.09 | 0.86 | Agree          | Engaging             |
| Blended learning allows me to work cooperatively with others              | 3.07 | 0.72 | Agree          | Engaging             |
| **Over-all**                                                              | **3.27** | **0.853** | **Strongly Agree** | **Highly Engaging** |

Table 3 shows that students strongly agree on the use of eLearning tools for education is “Highly Engaging” (M=3.27, SD=0.85) to have a meaningful learning experience. It reveals that students were highly engaged in Blended Learning mode because it allows the students to access online resources and materials according to their understanding and interest, to utilize technology/Applications in their studies, do multitasking, offers flexibility in terms of my availability- anytime and anywhere, practice technology purposely, and can easily do my homework respectively. As millennial learners are more technologically adept, attuned and interested to use technology. From a very young age, they are exposed to computers, the Internet, messenger, YouTube, social networking sites, and cellphones that provide instant communication and information both locally and globally.
3. What is the impact of blended learning to the respondents’ performance?

Table 4. Impact of Blended Learning to Respondent’s Performance in the Learning Process

| Learning Process Indicators | Mean | SD  | Interpretation | Description |
|-----------------------------|------|-----|----------------|-------------|
| I understand better my course materials with the Blended learning approach. | 3.28 | 0.86 | Strongly Agree | High Impact |
| I am motivated to learn with the combination of face-to-face instruction, and online videos and readings. | 3.27 | 0.80 | Strongly Agree | High Impact |
| I am able to share my ideas and other perspectives through Online discussions and forums. | 3.21 | 0.85 | Agree | Moderate Impact |
| Blended learning enables me to become more involved in the learning process. | 3.18 | 0.81 | Agree | Moderate Impact |
| I am more curious to learn new thing with Blended learning activities. | 3.16 | 0.77 | Agree | Moderate Impact |
| I am motivated to explore many ways to learn the course content. | 3.15 | 0.62 | Agree | Moderate Impact |
| I can reflect in many ways on what I have learned in blended learning mode. | 3.13 | 0.81 | Agree | Moderate Impact |
| I developed my collaboration skills in Blended learning mode. | 3.08 | 0.70 | Agree | Moderate Impact |
| I am more inquisitive of learning in blended learning mode. | 3.05 | 0.64 | Agree | Moderate Impact |
| I became proficient in finding practical solutions to course problems. | 3.03 | 0.75 | Agree | Moderate Impact |
| I developed good time management. | 2.62 | 0.47 | Agree | Moderate Impact |
| **Over-all** | 3.11 | 0.73 | Agree | Moderate Impact |

Table 4 show that participants agree that Blended learning has “Moderate Impact” (M=3.11, SD=0.733) on their performance in doing learning activities. Participants strongly agree on items that they are “motivated to learn with the combination of face-to-face instruction, and online videos and readings (M=3.27, SD=0.80) and they understand better course materials with the Blended learning approach (M=3.28, SD=0.86) and has high impact to their learning. Although students strongly agree that blended learning is highly engaging, it reveals that it has a moderate impact to their performance in doing the learning activities. This is because students are still new to this approach; they need time to get familiar and confident in using and exploring online learning applications in blended learning subjects.

4. Is there a significant relationship between the profile of the respondents and the impact of blended learning approach to students’ performance in terms of efficiency, engagement and learning process? 

There is a significant relationship between the family Income (r= -.252, p=.001) and the impact of blended learning approach to student’s performance and engagement. As the family income affects how the parents can afford and support their students in their learning needs. There is a significant relationship between the academic strand (r= .257, p=.000) of participants and the impact of blended learning to their learning process. Blended learning has also many challenges that affects with how the teachers design their course based on their major specialization. There are subjects that are too difficult to be offered online such as laboratory simulation, mathematical calculations and abstraction solution. Hence, teachers must design and present instruction in a more innovative and digitally creative level. Teachers must possess the technological knowledge and skills in order to do this.
4. Conclusions

Based on the findings of the study, the following conclusions are drawn. The students preferred an equal mix of face-to-face and online blended learning mode because they like the flexibility of the class content anytime online and they preferred more interactive and valuable class accordingly. The students are efficient in using Google Apps, YouTube, and Mobile phone, laptop and computer desktop as an eLearning tool respectively. In addition, the e-learning tools for education is highly engaging to the respondents. The Blended-learning mode allows the respondents to access global resources and materials that meets their level of knowledge and interest. However, the learning process has a moderate impact to the students to their performance, which helps the respondents to have a better understanding to the course material. Family income have negative correlation, and Academic strand have strong correlation to students' performance in blended learning in terms of engagement and learning process.

5. Recommendations

Based on the findings and conclusions, the following recommendations are drawn:

The teacher must allow students to use personal electronic device inside the classroom for relevant purposes like research, perform online learning activities such as forums, quizzes, video viewing, and educational games with maximum supervision in online environment. Relevant trainings for teachers should be proposed to intensify the implementation and use of On-line learning environment for blended learning approach. A study on teachers’ readiness, Technical, Pedagogical, and Knowledge skills should be assess to adapt blended learning mode is highly necessary for future study.

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