EDMODO: ITS EFFECTIVENESS AS A PLATFORM FOR BLENDED LEARNING AMONG PRE-SERVICE TEACHERS

Roullette P. Cordevilla, Vincent L. Banot, Jonah Mavel M. Velez, Normina A. Batucan,
Louis Edmund S. Maravilla
College of Teacher Education, Negros Oriental State University, Kagawasan Avenue, Dumaguete City, Negros Oriental, Philippines
*Email:vincent.liloonline01@gmail.com

ABSTRACT: *This study assesses the effectiveness of Edmodo in facilitating the development of 21st century skills among College of Teacher Education teachers using Edmodo and handling pre service teachers at Main Campus I of Negros Oriental State University. The teacher-respondents were those who are using Edmodo in their classes for two semesters. Consequently, their pre-service teachers (their students) were the student-respondents. The findings of the study revealed that both respondents utilized the platform with no definite number of times. The student-respondents perceived that Edmodo is an effective means in the development of their creativity, critical thinking, and information, media and literacy skills. However, they perceived the development of communication and collaboration as less effective. The teacher-respondents find the platform's features effective especially in tracking student progress and reviewing graded quizzes, and outputs. Both respondents often encounter technical problems when using Edmodo, connectivity and interrupted online quizzes and submission of outputs. Students' extent of Edmodo utilization is significantly related to their perception of the Edmodo's effectiveness in the development of their 21st century skills as well as to the challenges they met while utilizing Edmodo. The more they utilize the platform regardless of the frequency, amount of time spent per use, and purpose of accessing Edmodo, they perceive it as an effective means to develop their 21st century skills which are requisites for all pre-service teachers. Schools must provide stable internet connectivity so that Edmodo's features may be fully utilized. Teachers utilizing Edmodo must provide sufficient means to enhance students' communication and collaboration. Teachers should allow the practice of oral communication skills and team work. Outputs may include video clips of oral presentations, interpretations, role-play, simulation and other group activities to encourage students to work with others. Manufacturer of Edmodo may speed up optimization and data persistence especially when uploading heavy files.*
Keywords: Edmodo, LMS, blended learning, 21st century skills, pre-service teachers, online platforms, online learning

1. INTRODUCTION

Education, at present, puts premium not only on the learner's acquisition of content knowledge but more so on the development of skills essential for individuals to thrive in the real world. No longer is it sufficient for learners to have a comprehensive grasp of the subject area they are interested in, rather it is essential that they know what to do with the knowledge that they acquired. This reality requires that the youth of today must move beyond formulaic knowledge and skills [1] and must extend to practical application of knowledge acquired.

This shift poses a great demand upon educational institutions to raise the bars higher in terms of its instructional delivery. This challenge is even more pronounced in Teacher Education Departments where pre-service teachers are expected to develop, model and assess 21st century skills at the end of their training. Teacher training institutions are expected to provide opportunities for pre-service teachers to apply these competencies in the classroom and continue to hone these skills throughout their teaching careers [2].

These teacher training institutions are to ensure that the quality of instruction given to pre-service teachers embraces opportunities for the latter to develop 21st century skills. Thus, instructors in the College of Teacher Education are expected to utilize the blended mode of instruction to ensure that quality instructional delivery continues despite class interruptions (CTED Faculty Manual 2019). Integration of technology is encouraged and the use of platforms that will support Face-to-Face discussions is utilized.

One such platform is a web 2.0 tool called Edmodo. Edmodo is a closed social learning network considered unique because it gives a safe, private setting to users. Each student of a given class has a private access code provided by the teacher which enables the student to join the teacher's class. In other words, it is not open to just anyone [3].

The use of Edmodo to supplement face-to-face discussion is not a novelty. A number of studies have already pointed out the positive impact of using the said platform in instruction [4,5,6] while other researches point out students' negative reactions towards its use [7,8,9].

However, not one of the studies reviewed examined the utilization of Edmodo highlighting the development of 21st century skills especially among pre-service teachers. Very few studies also included teachers' perspectives in measuring the effectiveness of Edmodo as a platform for blended instruction [10,4].

This current study fills a gap in the teacher education literature as it will try to assess the effectiveness of Edmodo in facilitating the development of 21st century skills among pre-service teachers from the lens of both students and teachers utilizing the free version of Edmodo.

This study aims to assess the effectiveness of a Web 2.0 tool, Edmodo, as a platform for blended instruction especially in facilitating the development of 21st century skills among pre-service teachers in the College of Teacher Education, Main Campus of NORSU.

Specifically, it purports to shed light to the following questions:

1. What is the respondents' extent of EDMODO utilization in terms of:

    1.1. frequency of use
    1.2. amount of time spent per use; and
    1.3. purpose?

2. How do student respondents perceive EDMODO's effectiveness in the development of the following 21st century skills:

    2.1. creativity;
    2.2. critical thinking;
    2.3. communication;
    2.4. collaboration; and
    2.5. information, media and literacy Skills?

3. How do teacher respondents perceive EDMODO's effectiveness considering its various features?

4. What challenges are met by both student and teacher respondents in the utilization of EDMODO?

5. Is there a significant relationship between the student respondents' extent of EDMODO utilization and their perception on its effectiveness in the development of their 21st century skills?

6. Is there a significant relationship between the teacher respondents' extent of EDMODO utilization and their perception on its effectiveness considering its various features?

2. REVIEW OF RELATED LITERATURE
BLENDED LEARNING

Also known as "hybrid learning", blended learning **integrates online with traditional face-to-face class activities in a planned, pedagogically valuable manner ("The Definition of Blended Learning", 2018)**. It is one of the most important vehicles for education reform today [11]. Blended learning claims numerous advantages such as facilitating independent and collaborative learning experiences [12]. It is also believed that blending technology with face-to-face instruction can stimulate learning and provide more collaborative learning experiences [13,12].

Because Blended learning requires the integration of technology in a traditionally-paced classroom, the online environment becomes a complement to face-to-face meetings wherein the presence of both teachers and students are required. The goal of said online platforms is for students to function in online environments much like how they function in the traditional classroom.

Numerous studies have strengthened the link between integration of technology and better student learning. The effectiveness of virtual learning environment supported the idea of these online platforms as a supplementary tool for a face-to-face class as evidenced in a study where face-to-face instruction and online delivery mode provided better learning outcomes [14,12]. Web 2.0 computer environments help students to develop understanding of the inquiry-based learning process, improve the self-regulated learning behaviors and performance of students, and overall develop effective learning due to the burden of responsibility of learning and development of critical thinking skills [15,16].

Online learning can create interest and fosters after class learning activities [17]. The trend of merging asynchronous internet technology with face-to-face interaction is associated with improved pedagogy and easier access to information [18]. Further, implementation of blended learning in higher education is effective because of its flexibility and learner's expectation in the integration of technology in language

classes [19]. Social networks can be also used for supporting both distance learning and real classroom environment [20].

EDMODO

The teacher has a variety of options among Web 2.0 tools that can be utilized for blended learning. Web 2.0 tools are free digital programs designed for educational purposes that can be used for creating and sharing student-generated projects and products. They are interactive, multi-purpose, easy-to-use digital platforms. These tools encourage students to work with each other, create outputs as individuals or as members of groups and share what they have created with the entire class.

Among ICT applications, a frequently used and well-known e-learning environment is Edmodo. Edmodo is a Web 2.0 tool that gives teachers the opportunity to work with their students using real time. The platform can be accessed anywhere. Students are given a group code and only those with the access code can enroll in a certain class. This feature makes the platform safe and secure in its use. Moreover, parents are able to have a code of their own so they can also check on their children's performance in class.

Numerous studies have outlined the benefits of using Edmodo as a supplement to face-to-face meetings in class, especially in higher education. Edmodo and other social media are considered efficient learning aids in higher education [21]. The advantages of virtual learning environments, like Edmodo, at the higher institution level are convenience, accessibility and flexibility, with a better way of management of large-sized class, easier method of assigning homework, convenient way of giving a test and powerful way of giving preliminary courses. [22, 23, 24]. Further, Edmodo can facilitate teachers to set up and manage their online classes easily [25].

Edmodo is also seen as an effective collaborative tool. Teacher-student relationships led to a stronger classroom community by integrating Edmodo in the class as Edmodo provides a good cooperative learning platform for students [26,6]. Edmodo is a place for online learning interaction where it provides comfortable space for students to share and communicate with peer and teachers [27]. Edmodo is not just a social learning tool that provides educators ways to connect, collaborate, share content, assess homework, grades and other school works, but also facilitates sharing ideas beyond the classroom by connecting to the global experts of various disciplines [28,5]

Users, even non-digital natives show positive perception towards the use of Edmodo due to its simplicity, ease of use, and ability to enable instant interaction among users globally [6,4,29,30]. However, instructor characteristics is one crucial variable that impacts Edmodo adoption and usage [20]. Ozge Beyath [35]; Fahriye Altinay & Zehra Altinay (2018) also found that users tend to lack sufficient information on Edmodo's content system. In another study, few of the participants discontinued using Edmodo due to the lack of knowledge but overall agreed that all functions are employed easily and quickly after the training [31]. Teachers believe that it is very motivating for learners and it supports their teaching work [32].

3. SIGNIFICANCE OF THE STUDY

The trajectory of Negros Oriental State University in the next decade will be the full implementation of blended instruction and the findings of the study will help cement the need for this shift.

As one of the Centers of Development for Teacher Training, the College of Teacher Education can also utilize results of this study to improve its instructional delivery especially with the direction of developing 21st century skills among pre-service teachers. This will enable the department to produce multi-literate and multi-skilled teachers who are ready to take on the challenges of teaching in the 21st century. The College of Teacher Education can partner and link with other teacher training institutions from other state colleges and universities across the nation to share its best practices in blended instruction.

Results of this current study will also be of significant help to the researchers who are users of this platform. Qualitative findings will help them improve their utilization of EDMODO so they can best maximize the platform's features.

4. METHODOLOGY

Research Design

The study utilized the explanatory sequential mixed methods design. The explanatory sequential mixed methods design utilized data from both the initial quantitative phase via questionnaire and the subsequent qualitative phase through focus group discussions. The said combination of quantitative and qualitative methods utilizes the strengths of both methods to help explain significant findings better than each method alone. Specifically, the qualitative data may shed light on why the significant or non-significant quantitative data occurred [33].

Sampling Technique

Purposive sampling was employed to determine the number of respondents. This sampling technique was utilized to ensure that respondents/participants met the pre-determined criteria set for this study.

Data Gathering Procedure

For the quantitative phase, data was gathered with the use of two sets of questionnaires. Set A was utilized by student respondents and most items for this questionnaire are adopted from several sources [6,30,15,22]. Set B was used in gathering data from teacher respondents. This is a researcher-made questionnaire that aims to gather information on Edmodo's effectiveness regarding its various features. Both questionnaires underwent content validation by three experts of the Edmodo platform.

The qualitative phase followed and for this phase, information was gathered through Focus Group Discussion. Focus group discussions are a method of gathering qualitative data from a predetermined set of people who share experience with Edmodo, by a trained moderator, intending to incite greater spontaneity from respondents usually stifled by one-on-one interviews. Data to be gathered from the participants would be their various perspectives of the research topic [34]. Guide questions in interviewing the student/teacher participants were adopted from S.S. Oyerele et al.

Statistical Treatment of Data

The following statistical tools will be utilized in this study:
Mean. This will be used to determine the extent of Edmodo utilization in terms of frequency of use; amount of time spent per use; and purpose.

Weighted Mean. This will be utilized to identify Edmodo's effectiveness in the development of the 21st century skills based on the student respondents' perception and the teacher respondents' perception regarding Edmodo's various features. This will also be used to determine the extent of challenges met by both student and teacher respondents in the utilization of Edmodo.

PRESENTATION OF DATA

Table 1.1
Respondents' Extent of EDMODO utilization in terms of Frequency of Use

Frequency of Use	Student Respondents		Teacher Respondents	
	Frequency	Percentage	Frequency	Percentage
Once a Week	42	14.0	1	14.3
Twice a Week	58	19.3	0	0
Thrice a Week	30	10.0	0	0
Four Times a Week	10	3.3	1	14.3
Five Times a Week	15	5.0	2	28.6
No Definite Number of Times	145	48.3	3	42.9
TOTAL	**300**	**100**	**7**	**100**

Table 1.1 shows the data on the student and teacher respondents' extent of EDMODO utilization in terms of frequency of use. It can be noted that both the student and teacher respondents utilize Edmodo only when needed, with a percentage of 48.3 and 42.9 respectively. Edmodo is an online platform that lets students use it at their own pace whenever and wherever they want. However, many academic activities undertaken by the students do not motivate them to utilize Edmodo all the time [21]. According to a study by Jamal & Shanaah (2011) [40], opening discussion topics on a learning management system (LMS) depends on the structure of the course and this will increase the administrative work of the teachers. Teachers were not interested since the usage of LMS added more workload for them.

Table 1.2.1: Student Respondents' Extent of EDMODO utilization in terms of Amount of Time Spent Per Use

Amount of Time Spent Per Use	Student Respondents	
	Frequency	Percentage
1 – 15 Minutes	18	6.0
16 – 30 Minutes	40	13.3
31 – 45 Minutes	8	2.7
46 Minutes – 1 Hour	179	59.7
More Than 1 Hour	55	18.3
TOTAL	**300**	**100**

Table 1.2.1
Teacher Respondents' Extent of EDMODO utilization in terms of Amount of Time Spent Per Use

Amount of Time Spent Per Use	Teacher Respondents	
	Frequency	Percentage
Less Than 5 Hours	4	57.1
More than 5 Hours	3	42.9
TOTAL	**7**	**100**

Table 1.2.1 reflects the student and teacher respondents' extent of Edmodo utilization in terms of amount of time spent per use. It is shown that most of the students use Edmodo approximately for 46 minutes to an hour. On the other hand, teachers utilize Edmodo for less than 5 hours. In line with the studies of Ngo & Ngadiman [41] and Oyelere, S., Paliktzoglou, V. & Suhonen, J. [21], this study validates that Edmodo provides responsible learning and active learning engagement in which students access and use Edmodo very often that provides a safe and easy means for them. Moreover, teachers opt to use Edmodo since it can automate some routine tasks and offers a host of features that aid online teaching and learning in a convenient manner.

Table 1.3.1
Student Respondents' Extent of EDMODO utilization in terms of Purpose

Indicators	SD	Mean	Extent of Utilization
Take quizzes.	0.732	4.597	Always
Check/verify scores for quizzes taken.	0.791	4.420	Always
Check on updates for the class.	0.743	4.500	Always
Communicates with groupmates/teachers when the need arises.	1.228	3.417	Seldom
Submit assignments.	0.601	4.630	Always
Check/verify scores for submitted assignments.	0.793	4.437	Always
Submit group outputs.	0.799	4.383	Always
Upload resources/outputs for the class (PPT presentations, video clips, rubrics, etc.)	0.980	4.173	Frequently
Download resources shared by the teacher.	0.899	4.220	Frequently
Average Mean		**4.309**	**Always**

Legend: 1 – 1.8 (Never), 1.9 – 2.6 (Rarely), 2.7 – 3.4 (Seldom), 3.5 – 4.2 (Frequently), 4.3 – 5 (Always)

As reflected in the data, when using Edmodo, students at all times take quizzes, check their scores for quizzes taken and updates for the class, submit assignments, check and verify scores for submitted assignments and submit group outputs. Frequently, they upload resources and outputs for the class and download resources shared by the teacher in Edmodo. On the other hand, students seldom communicate with groupmates and teachers when the need arises. Table 1.3.1 shows that the average mean of the students' extent of Edmodo utilization in terms of purpose is 4.309 which falls

under the category of always. This is supported by a study of Ngo and Ngadiman (2019) [41] that through Edmodo, students became more determined to study the materials before classes and accomplish their assignments and quizzes as assigned. The active participation of students was denoted by the high percentage of the students who downloaded the class materials before the class. Edmodo offers learner-centered method and learner-content interaction which refers to any interactive activities between the students and lesson materials uploaded in an online learning environment. Communicating with groupmates and teachers when the need arises has a lowest mean among all the indicators. Students were to follow up with class activities while handling their time to interact with friends and the teacher. The discussion among group members facilitated by text and social interaction can increase comprehension, thinking skills and self-directed response of students participating in the social network [15].

Table 1.3.2
Teacher Respondents' Extent of EDMODO utilization in terms of Purpose

Indicators	SD	Mean	Extent of Utilization
QUIZZES			
Prepare quizzes.	0.900	4.143	Frequently
Check quizzes.	0.900	4.143	Frequently
NOTIFICATIONS			
Check on updates for the class.	0.976	3.429	Seldom
Communicates with students.	1.000	3.000	Seldom
Collaborate/connect with other teachers in the Edmodo community	1.397	2.429	Rarely
ASSIGNMENTS/OUTPUTS			
Prepare assignments.	0.756	3.714	Frequently
Check assignments/outputs submitted by students.	0.900	4.143	Frequently
POSTS			
Upload resources for the class (PPT presentations, video clips, rubrics, etc.)	1.069	3.857	Frequently
Download resources shared by the teacher.	0.976	3.571	Frequently
Average Mean		**3.603**	**Frequently**

Legend: 1 – 1.8 (Never), 1.9 – 2.6 (Rarely), 2.7 – 3.4 (Seldom), 3.5 – 4.2 (Frequently), 4.3 – 5 (Always)

Table 1.3.2 represents the teachers' extent of Edmodo utilization in terms of purpose. Majority of the indicators show that teachers prepare and check quizzes, prepare and check assignments and outputs submitted by students, upload resources for the class and download resources shared by

other teachers in a frequent manner. In checking on updates for the class and communicating with students, teacher respondents' extent of utilization is seldom. Lastly, collaborating or connecting with other teachers in the Edmodo community has a lowest mean of 2.429 which can be categorized as rarely. The results from the table shows the average mean of 3.603 which can be signified that teacher respondents use Edmodo frequently. Edmodo has a better approach of administration of huge class, easier method of giving homework, convenient way of giving a test and preliminary courses [24]. In addition, it is a social learning platform that offers teachers to connect, collaborate, assess homework, grades and other school stuff. Teachers find Edmodo's effectiveness in collaboration where the teacher themselves can respond to the students immediately and interaction with other teachers, students and professionals all over the world is possible [30] which opposes the result of the study indicating that teachers hardly interact with the students and other teachers in the Edmodo community. Teachers should be active participants in the Edmodo network and strengthen professional development of others by equipping fellow teachers with needed skills in using Edmodo for teaching and learning, thus, promoting networking and collaboration.

Table 2.1
Student Respondents' Perception of EDMODO's Effectiveness in the Development of Creativity

Indicators	SD	Mean	Perception
The student is exposed to new and innovative approaches to teaching and learning (i.e. incorporation of technology in education, blended instruction, etc.).	1.036	3.770	Effective
The student is able to integrate innovative ideas when he/she prepare for teaching demonstrations and other performance-based outputs such as adding video clips and illustrations in his/her PowerPoint presentation.	1.144	3.637	Effective
The student is able to try out new learning strategies that he/she learn from the resources shared in Edmodo.	1.211	3.527	Effective
Average Mean		**3.644**	**Effective**

Legend: 1 – 1.8 (Undecided), 1.9 – 2.6 (Least Effective), 2.7 – 3.4 (Less Effective), 3.5 – 4.2 (Effective), 4.3 – 5 (Highly Effective)

Table 2.1 shows the data on student respondents' perception of EDMODO's effectiveness in the development of creativity. Overall, the indicators have an average mean of 3.644, which is categorized to be perceived as effective. This is in line with Widyaningrum, et al.'s (2020) [43] and Hadjarati et al.'s (2020) [39] studies which found that the use of EDMODO has a positive effect on students' creative thinking in English and Science subjects, respectively.

Table 2.2
Student Respondents' Perception of EDMODO's Effectiveness in the Development of Critical Thinking

Indicators	SD	Mean	Perception
Activities and quizzes given via Edmodo develop the student's higher order thinking skills (analysis, synthesis, etc.).	1.140	3.643	Effective
Projects given to the student via Edmodo provide opportunities for him/her to exercise analytical and evaluative skills.	1.138	3.577	Effective
Assignments, quizzes and other online tasks given by the teacher in Edmodo helped the student improve his/her learning and comprehension skills about the course.	1.087	3.713	Effective
The reference materials (e.g. internet articles, online videos, PowerPoint files, etc.) posted by the student's teacher are useful in understanding the contents/topics of the course better.	1.006	3.927	Effective
The Edmodo environment supported the student to connect concepts with cases and examples.	1.336	3.247	Less Effective
The Edmodo environment facilitated personal reflection.	1.317	3.267	Less Effective
The Edmodo environment supported the student to capture his/her thoughts on what he/she was learning.	1.166	3.550	Effective
Average Mean		**3.561**	**Effective**

Table 2.2 shows the data on student respondents' perception of EDMODO's effectiveness in the development of critical thinking. Overall, the indicators have an average mean of 3.561, which is categorized as effective. It is of note thought that two indicators are categorized as less effective. The student respondents found EDMODO to be less effective at supporting them to connect concepts with cases and examples. They also found it less effective at facilitating personal reflection. Kim, et al. (2020) [45] found that students' learning effort impacts their perceived higher order thinking skills because the learning effort drives them to spend more time learning. However, as stated in the interpretation of Table 1, many academic activities undertaken by the students do not motivate them to utilize Edmodo all the time (Oyelere, Paliktzoglou & Suhonen, 2014) [21]. In addition to this, Akatsuka (2020) [46] found that a resistance towards tackling questions that required higher-order thinking was observed among low English proficiency level students compared to a face-to-face classroom setting, which may also be a probable cause.

Table 2.3
Student Respondents' Perception of EDMODO's Effectiveness in the Development of Communication

Indicators	SD	Mean	Perception
The Edmodo environment supported the student to discuss course concepts with others in the course.	1.302	3.267	Less Effective
The Edmodo environment supported the student to get more information or support from the instructor.	1.069	3.630	Effective
Edmodo allows the student to easily interact/participate with his/her classmates and teacher about assignments, group tasks, and other course activities.	1.178	3.400	Less Effective
The student can master the skills for online discussion.	1.274	3.163	Less Effective
Average Mean		**3.365**	**Less Effective**

Legend: 1 – 1.8 (Undecided), 1.9 – 2.6 (Least Effective), 2.7 – 3.4 (Less Effective), 3.5 – 4.2 (Effective), 4.3 – 5 (Highly Effective)

Table 2.3 shows the data on student respondent's perception of EDMODO's effectiveness in the development of communication. Overall, the indicators have an average mean of 3.365 which is categorized as less effective. Information gained from the focus group discussions point to the student respondents' preference for Facebook for communication. Duncan and Barczyk's (2016) [38] research findings show that students in the Facebook-enhanced courses experienced a somewhat more positive community of practice, sense of learning and sense of connectedness compared to students in non-Facebook-enhanced courses which is clearly reflected in the students' perception of Edmodo's effectiveness for communication and collaboration, as its usage is not free nor as easy to access as that of Facebook's.

Table 2.4
Student Respondents' Perception of EDMODO's Effectiveness in the Development of Collaboration

Indicators	SD	Mean	Perception
The Edmodo environment supported the student to get to know others in the course and/or create a sense of comfort and community.	1.234	3.283	Less Effective
The Edmodo environment facilitated the student's participation in the course.	1.076	3.593	Effective
The Edmodo environment supported the student to work with others in the course, building on ideas or resources together.	1.252	3.283	Less Effective
The student feels as a part of the group.	1.147	3.663	Effective
There is a sense of belonging in a group.	1.523	3.613	Effective
Edmodo supports group learning.	1.198	3.507	Effective
The program is good for cooperative learning.	1.290	3.367	Less Effective
The student learns the skill for collaborative problem solving.	1.338	3.183	Less Effective
Edmodo helps the student in solving problems.	1.371	3.050	Less Effective
Average Mean		**3.394**	**Less Effective**

Legend: 1 – 1.8 (Undecided), 1.9 – 2.6 (Least Effective), 2.7 – 3.4 (Less Effective), 3.5 – 4.2 (Effective), 4.3 – 5 (Highly Effective)

Table 2.4 shows the data on student respondent's perception of EDMODO's effectiveness in the development of collaboration. Overall, the indicators have an average mean of 3.394 which is categorized as less effective. Though individual indicators point out that EDMODO enabled students to feel as part of a group, fostered a sense of belonging in a group, and supported group learning, they still point out their preference for Facebook as their main means of collaboration as gathered from the focus group discussions.

Table 2.5
Student Respondents' Perception of EDMODO's Effectiveness in the Development of Information, Media and Literacy Skills

Indicators	SD	Mean	Perception
Edmodo allows the student to easily access reference materials on the course provided by the teacher.	0.958	3.893	Effective
The student can easily access the required files (syllabus, handouts, PPT slides, videos) from Edmodo.	0.986	3.878	Effective
The student can easily access the suggested supplementary references (internet articles, videos, etc.).	1.139	3.673	Effective
Reference materials posted by the student's teachers are easy to access and useful in understanding the contents/topics of the course better.	1.057	3.810	Effective
Being able to share and access other students' comments or feedback helps the student improve his/her learning.	0.954	3.850	Effective
Average Mean		**3.821**	**Effective**

Legend: 1 – 1.8 (Undecided), 1.9 – 2.6 (Least Effective), 2.7 – 3.4 (Less Effective), 3.5 – 4.2 (Effective), 4.3 – 5 (Highly Effective)

Table 2.5 shows the data on student respondent's perception of EDMODO's effectiveness in the development of information, media and literacy skills. Overall, the indicators have an average mean of 3.821 which is categorized as effective with all individual indicators being categorized as

effective as well. As stated in Table 1.3.2 earlier, Edmodo has a better approach of administration of huge class, easier method of giving homework, convenient way of giving a test and preliminary courses [24]. Students finding that their classmates' feedback improves their learning is in line with Chung and Yunus' (2021) [36] study where significant improvement in student performance was found after conducting peer feedback with EDMODO.

Table 3
Teacher Respondents' Perception of EDMODO's Effectiveness Considering Its Various Features

Indicators: Edmodo allows the teacher to	SD	Mean	Perception
create/post tests and quizzes.	0.690	4.143	Effective
create/post assignments and similar tasks.	0.488	4.286	Highly Effective
organize his/her teaching resources for better curriculum delivery.	1.254	3.714	Effective
prepare quizzes/tests/activities in advance.	1.414	4.000	Effective
store resources for future use (Library feature).	0.488	4.286	Highly Effective
track/retrieve student assignments/outputs.	0.535	4.429	Highly Effective
share resources from other applications (i.e., Slide Share, YouTube).	0.378	4.143	Effective
review graded quizzes, outputs, and/or assignments.	0.535	4.429	Highly Effective
identify items in given quizzes that students find difficult/easy.	1.345	3.857	Effective
track students' progress.	0.535	4.429	Highly Effective
gain a holistic view on how students are learning in the teacher's class.	1.345	3.857	Effective
create small groups within a class for easier monitoring and supervision.	1.574	3.143	Less Effective
feedback individually on students' outputs/assignments/other class requirements.	0.577	4.000	Effective
message students individually on matters concerning their progress.	1.272	3.571	Effective
provide students with rewards/acknowledgment for their class performance (i.e, badges).	1.604	3.286	Less Effective
export raw scores from quizzes/assignments/outputs to other software/program.	1.604	3.286	Less Effective
communicates easily with students on updates/notifications and feedback their class performances.	0.690	3.857	Effective
creates linkages with other professionals in the Edmodo community.	1.512	2.571	Least Effective
share best practices with other professionals in the Edmodo community.	1.773	2.857	Less Effective
Average Mean		**3.797**	**Effective**

Legend: 1 – 1.8 (Undecided), 1.9 – 2.6 (Least Effective), 2.7 – 3.4 (Less Effective), 3.5 – 4.2 (Effective), 4.3 – 5 (Highly Effective)

A comparison of the mean ratings of teacher respondents' perception of EDMODO's effectiveness considering its various features revealed highly effective in creating/posting assignments and similar tasks; storing resources for future use (Library feature); tracking/retrieving student assignments/outputs; reviewing graded quizzes, outputs, and/or assignments; and tracking students' progress, effective in creating/posting tests and quizzes; organizing his/her teaching resources for better curriculum delivery; preparing quizzes/tests/activities in advance; sharing resources from other applications (i.e., Slide Share, YouTube); identifying items in given quizzes that students find difficult/easy; gaining a holistic view on how students are learning in the teacher's class; giving feedback individually on students' outputs/assignments/other class requirements; messaging students individually on matters concerning their progress; and communicating easily with students on updates/notifications and feedback their class performances, less effective in creating small groups within a class for easier monitoring and supervision; providing students with rewards/acknowledgment for their class performance (i.e, badges); exporting raw scores from quizzes/assignments/outputs to other software/program; and sharing best practices with other professionals in the Edmodo community, and least effective in creating linkages with other professionals in the Edmodo community.

There may be various possible explanations in these differences in teacher respondents' perception of EDMODO's effectiveness considering its various features. One possibility is that the teachers are new to EDMDO. Another possible reason is that teacher respondents are not updated to the new features of EDMDO. This is supported by research that has been done by H Yanti et al 2018 [44], saying that more than a half of teacher reported positive perception about the use of E-Learning/Edmodo in overall.

Table 4.1
Challenges Met by the Student Respondents in the Utilization of EDMODO

Indicators	SD	Mean	Perception
Quizzes, assignments and other activities in Edmodo take a lot of time to answer.	0.994	3.167	Neutral
Online activities and uploading of submission are frequently interrupted by poor internet connectivity.	0.944	4.237	Agree
It is easy to cheat with Edmodo.	0.953	2.167	Disagree
Edmodo is difficult to use.	0.876	2.430	Disagree
Edmodo is frequently affected by technical problems (i.e., unable to take the quiz, answers were not reflected after submission of quiz/assignment, limited file size upload, etc.).	0.984	3.790	Agree
Edmodo makes learning difficult.	0.820	2.583	Disagree
Edmodo runs slowly on my device.	1.075	3.207	Neutral
Average Mean		**3.083**	**Neutral**

Legend: 1 – 1.8 (Strongly Disagree), 1.9 – 2.6 (Disagree), 2.7 – 3.4 (Neutral), 3.5 – 4.2 (Agree), 4.3 – 5 (Strongly Agree)

Table 5 shows that the respondents **agreed on challenges in terms of** internet connectivity and technical problems. Moreover, they are neutral that activities in Edmodo take a lot of time to answer and Edmodo runs slowly on their device. Lastly, the respondents disagreed that they can easily cheat in Edmodo and that Edmodo is difficult to use. As a result, the mean of the questionnaire data is 3.083 which is neutral. This is supported by research that has been done by Mark Angelo S. Enriquez 2014, saying that Edmodo appears to be a wonderful learning platform which is so simple that observations and data show a high level of acceptance and response by the participants. There are also some disadvantages using Edmodo such as time consuming, difficulty in following the procedures of Edmodo, plagiarism of other works and not all students have access to the internet.

Table 4.2
Challenges Met by the Teacher Respondents in the Utilization of EDMODO

Indicators	SD	Mean	Perception
Preparing quizzes, assignments, and other activities in Edmodo takes a lot of time to prepare.	1.380	3.286	Neutral
Preparation of online activities and uploading of resources are interrupted by poor internet connection.	1.000	4.000	Agree
It is easy for students to cheat with Edmodo.	1.113	3.286	Neutral
Edmodo is difficult to use.	1.215	2.857	Neutral
Edmodo is affected by technical problems (i.e., unable to take the quiz, answers were not reflected after submission of quiz/assignment, limited file size upload, etc.).	0.976	3.571	Agree
Edmodo makes teaching difficult.	0.488	2.286	Disagree
Edmodo runs slowly on my device.	1.155	3.000	Neutral
Average Mean		**3.184**	**Neutral**

Legend: 1 – 1.8 (Strongly Disagree), 1.9 – 2.6 (Disagree), 2.7 – 3.4 (Neutral), 3.5 – 4.2 (Agree), 4.3 – 5 (Strongly Agree)

The results of this analysis suggest that majority of the respondents encountered poor internet connection and technical problems. Moreover, the respondents are neutral that activities in Edmodo takes a lot of time to prepare; students can cheat in Edmodo; Edmodo is difficult to use; and Edmodo runs slowly on their device. Lastly, the respondents disagreed that Edmodo makes teaching difficult. As a result, the mean of the questionnaire data is 3.184 which is neutral. These findings clarified H Yanti et al 2018 [44] research

result indicating that the teachers perceived that e-learning/ Edmodo is a useful and also easy to use technology. It was found out that the teachers are satisfied with advantages of the use of this new technology in their LMS.

Table 5.1
Relationship of the Student Respondents' Extent of EDMODO Utilization and their Perception on Its Effectiveness in the Development of their 21st Century Skills

Variables Considered in the Study	Chi-Square	P-Value	Interpretation
Students' Extent of EDMODO Utilization in terms of Frequency of Use VS their Perception on EDMODO's Effectiveness in the Development of the 21st Century Skills			
Students' extent of EDMODO utilization in terms of **frequency of use** VS their perception on EDMODO's effectiveness in the development of **creativity**	12.698	0.123	Non-significant
Students' extent of EDMODO utilization in terms of **frequency of use** and their perception on EDMODO's effectiveness in the development of **critical thinking**	16.889	0.010	Significant
Students' extent of EDMODO utilization in terms of **frequency of use** and their perception on EDMODO's effectiveness in the development of **communication**	18.457	0.018	Significant
Students' extent of EDMODO utilization in terms of **frequency of use** and their perception on EDMODO's effectiveness in the development of **collaboration**	20.459	0.009	Significant
Students' extent of EDMODO utilization in terms of **frequency of use** and their perception on EDMODO's effectiveness in the development of **information, media and literacy skills**	18.194	0.018	Significant
Students' Extent of EDMODO Utilization in terms of Amount of Time Spent Per Use VS their Perception on EDMODO's Effectiveness in the Development of the 21st Century Skills			
Students' extent of EDMODO utilization in terms of **amount of time spent per use** and their perception on EDMODO's	11.835	0.159	Non-significant

effectiveness in the development of **creativity**			
Students' extent of EDMODO utilization in terms of **amount of time spent per use** and their perception on EDMODO's effectiveness in the development of **critical thinking**	14.899	0.021	Significant
Students' extent of EDMODO utilization in terms of **amount of time spent per use** and their perception on EDMODO's effectiveness in the development of **communication**	12.039	0.149	Non-significant
Students' extent of EDMODO utilization in terms of **amount of time spent per use** and their perception on EDMODO's effectiveness in the development of **collaboration**	8.026	0.431	Non-significant
Students' extent of EDMODO utilization in terms of **amount of time spent per use** and their perception on EDMODO's effectiveness in the development of **information, media and literacy skills**	21.040	0.007	Significant
Students' Extent of EDMODO Utilization in terms of Purpose VS their Perception on EDMODO's Effectiveness in the Development of the 21st Century Skills			
Students' extent of EDMODO utilization in terms of **purpose** and their perception on EDMODO's effectiveness in the development of **creativity**	5.104	0.277	Non-significant
Students' extent of EDMODO utilization in terms of **purpose** and their perception on EDMODO's effectiveness in the development of **critical thinking**	17.279	0.001	Significant
Students' extent of EDMODO utilization in terms of **purpose** and	21.504	0.000	Significant

their perception on EDMODO's effectiveness in the development of **communication**			
Students' extent of EDMODO utilization in terms of **purpose** and their perception on EDMODO's effectiveness in the development of **collaboration**	13.773	0.008	Significant
Students' extent of EDMODO utilization in terms of **purpose** and their perception on EDMODO's effectiveness in the development of **information, media and literacy skills**	10.345	0.035	Significant
Students' Extent of EDMODO Utilization VS their Perception on EDMODO's Effectiveness in the Development of the 21st Century Skills			
Students' extent of EDMODO utilization in general and their perception of the EDMODO's effectiveness in the development of the 21st century skills in general	9.472	0.050	Significant

Table 5.1 shows the relationship between the student respondents' extent of EDMODO utilization and their perception on its effectiveness in the development of their 21st Century Skills. The following are the interpretations of each item shown in the table above.

1. There is no significant relationship between the student respondents' extent of frequency of use of Edmodo and their extent of perception of its effectiveness in the development of creativity as a 21st century skill. This means that the students' frequency of use of Edmodo could not be related to the development of their creativity.

2. There is a significant relationship between the student respondents' extent of frequency of use of Edmodo and their extent of perception of its effectiveness in the development of critical thinking as a 21st century skill. This means that the students' frequency of use of Edmodo could be related to the development of their critical thinking.

3. There is a significant relationship between the student respondents' extent of frequency of use of Edmodo and their extent of perception of its effectiveness in the development of communication as a 21st century skill. This means that the students' frequency of use of Edmodo could be related to the development of their communication.

4. There is a significant relationship between the student respondents' extent of frequency of use of Edmodo and their extent of perception of its effectiveness in the development of collaboration as a 21st century skill. This means that the students' frequency of use of Edmodo could be related to the development of their collaboration.

5. There is a significant relationship between the student respondents' extent of frequency of use of Edmodo and their extent of perception of its effectiveness in the development of information, media and literacy skills as a 21st century skill. This means that the students' frequency of use of Edmodo could be related to the development of their information, media and literacy skills.

6. There is no significant relationship between the student respondents' extent of amount of time spent per use of Edmodo and their extent of perception of its effectiveness in the development of creativity as a 21st century skill. This means that the students' amount of time spent per use of Edmodo could not be related to the development of their creativity.

7. There is a significant relationship between the student respondents' extent of amount of time spent per use of Edmodo and their extent of perception of its effectiveness in the development of critical thinking as a 21st century skill. This means that the students' amount of time spent per use of Edmodo could be related to the development of their critical thinking.

8. There is no significant relationship between the student respondents' extent of amount of time spent per use of Edmodo and their extent of perception of its effectiveness in the development of communication as a 21st century skill. This means that the students' amount of time spent per use of Edmodo could not be related to the development of their communication.

9. There is no significant relationship between the student respondents' extent of amount of time spent per use of Edmodo and their extent of perception of its effectiveness in the development of collaboration as a 21st century skill. This means that the students' amount of time spent per use of Edmodo could not be related to the development of their collaboration.

10. There is a significant relationship between the student respondents' extent of amount of time spent per use of Edmodo and their extent of perception of its effectiveness in the development of information, media and literacy skills as a 21st century skill. This means that the students' amount of time spent per use of Edmodo could be related to the development of their information, media and literacy skills.

11. There is no significant relationship between the student respondents' extent of purpose of use of Edmodo and their extent of perception of its effectiveness in the development of creativity as a 21st century skill. This means that the students' purpose of use of Edmodo could not be related to the development of their creativity.

12. There is a significant relationship between the student respondents' extent of purpose of use of Edmodo and their extent of perception of its effectiveness in the development of critical thinking as a 21st century skill. This means that the students' purpose of use of Edmodo could be related to the development of their critical thinking.

13. There is a significant relationship between the student respondents' extent of purpose of use of Edmodo and their extent of perception of its effectiveness in the development of communication as a 21st century skill. This means that the students' purpose of use of Edmodo could be related to the development of their communication.

14. There is a significant relationship between the student respondents' extent of purpose of use of Edmodo and their extent of perception of its effectiveness in the development of collaboration as a 21st century skill. This means that the students' frequency of use of Edmodo could be related to the development of their collaboration.

15. There is a significant relationship between the student respondents' extent of purpose of use of Edmodo and their extent of perception of its effectiveness in the development of information, media and literacy skills as a 21st century skill. This means that the students' purpose of use of Edmodo could be related to the development of their information, media and literacy skills.

16. In general, there is a significant relationship between the student respondents' extent of utilization of Edmodo and their extent of perception of its effectiveness to the development of their 21st century skills. This means that the students' utilization of Edmodo could be related to the development of their 21st century skills.

The interpretations aforementioned is a sufficient evidence that the frequency of use, amount of time spent per use, and purpose of use of Edmodo affect the 21st century skills of the student respondents of this study. The use of Edmodo is effective for the development of the 21st century skills of the student respondents. This implies that the use of Edmodo may be effective for the development of the 21st century skills of college and university students.

Didem Inel Ekici (2017), in his article "The Use of Edmodo in Creating an Online Learning Community of Practice for Learning to Teach Science", published at Malaysian Online Journal of Educational Sciences, opined that the results obtained from the data analysis showed that pre-service primary teachers generally had positive views about the use of Edmodo in teacher education programmes. He further added that Edmodo can be used to create an online community of practice in teacher education programmes.

Erna Basania Siahaan (2020) [42], in her article entitled "Students' Perception of Edmodo Use as a Learning Tool", published at the Journal of English Teaching, disclosed that the results of her study showed that the participants perceived Edmodo use improved their language skills, developed interaction and communication, enhanced the freedom to share ideas, and promoted their vocabulary and creativity.

Abdullah S. Alqanhtani (2019), in his article entitled "The Use of Edmodo: Its Impact on Learning and Students' Attitudes Toward It", published in the Journal of Information Technology Education: Research", disclosed that his findings show that using Edmodo leads to a statistically significant improvement in learning skills among higher-education students. The results also illustrates that students have positive attitudes toward the use of Edmodo in their courses.

Parlindungan Pardede (2015), in his article entitled "Current Studies on the Use of Edmodo in EFL Learning: A Review", published at Research Gate, revealed that Edmodo is effective to improve the students' four language skills and grammar. Edmodo use significantly enhanced students' learning motivation, autonomy, and responsibility; increased students' engagement in learning activities; improved their interaction with peers and teacher; and developed the classroom dynamics. The participants had a positive

perception towards Edmodo. The participants viewed Edmodo user-friendly, flexible, and easy to adapt to various learning approach, and these made students enjoy learning through it.

Mark Angelo Enriquez, in his paper entitled Students' Perceptions on the Effectiveness of the Use of Edmodo as a Supplementary Tool for Learning", presented at the DLSU Research Congress 2014, concluded that overall, the finding of his study affirmed that majority of participants considered Edmodo as an effective supplementary tool for their learning.

Table 5.2
Relationship of the Student Respondents' Extent of EDMODO Utilization and the Challenges They Met in the Utilization of EDMODO

Variables Considered in the Study	Chi-Square Value	P-Value	Interpretation
Teachers' extent of EDMODO utilization in terms of **frequency of use** and the **challenges** they met in the utilization of EDMODO	22.743	0.004	Significant
Teachers' extent of EDMODO utilization in terms of **amount of time spent per use** and the **challenges** they met in the utilization of EDMODO	13.173	0.106	Non-significant
Teachers' extent of EDMODO utilization in terms of **purpose** and the **challenges** they met in the utilization of EDMODO	21.675	0.000	Significant
Teachers' extent of EDMODO utilization **in general** and the **challenges** they met in the utilization of EDMODO	10.406	0.034	Significant

Table 5.2 presents the relationship of the student respondents' extent of utilization of Edmodo and the challenges that they met during the utilization of Edmodo. The following are the interpretations of the results shown in the table.
1. There is a significant relationship between the student respondents' extent of frequency of use of Edmodo and the challenges that they met in the utilization of Edmodo. This means that the students' frequency of use of Edmodo could be related to the challenges that they met during their use of Edmodo.
2. There is no significant relationship between the student respondents' extent of amount of time per use of Edmodo and the challenges that they met in the utilization of Edmodo. This means that the students' amount of time per use of Edmodo could not be related to the challenges that they met during their use of Edmodo.
3. There is a significant relationship between the student respondents' extent of purpose of use of Edmodo and the challenges that they met in the utilization of Edmodo. This means that the students' purpose of use of Edmodo could be

related to the challenges that they met during their use of Edmodo.
4. In general, there is a significant relationship between the student respondents' extent of amount of time per use of Edmodo and the challenges that they met in the utilization of Edmodo. This means that the students' amount of time per use of Edmodo could be related to the challenges that they met during their use of Edmodo.

The aforementioned interpretations support to the existing knowledge that extent of utilization can be affected by the challenges that the students' have met during the utilization. Students who were having more challenges in using Edmodo may have lesser extent of utilization of Edmodo, and students who were having lesser challenges in using Edmodo may have higher extent of utilization of Edmodo.

Didem Inel Ekici (2017), in his article "The Use of Edmodo in Creating an Online Learning Community of Practice for Learning to Teach Science", published at Malaysian Online Journal of Educational Sciences, disclosed that most pre-service primary teachers stated that Edmodo provides the possibility of sharing knowledge, experiences, and views. However, some pre-service teachers stated that Edmodo has some limitations; for example, the fact that it requires the user to have internet access.

CONCLUSIONS
SOP 1. Both student and teacher respondents express that they utilize the platform with no definite number of times. Students use the platform between 30 minutes to 1 hour while teacher respondents spend less than 5 hours per use. Students always use the platform for a variety of reasons but mostly because they want to submit assignments for the class. Teachers on the other hand use the platform frequently for purposes of preparing and checking assignments and quizzes.
SOP 2. Respondents perceive the platform as an effective means in the development of their creativity, critical thinking and information, media and literacy skills. However, they look at it as less effective in the development of communication and collaboration. This is largely because tasks/outputs assigned to students during the pandemic are mainly done individually which provide very little avenue for the development of both communication and collaboration.
SOP 3. Teacher respondents find the platform's features effective specially in tracking student progress and reviewing graded quizzes, outputs, and or assignments.
SOP 4. Among the challenges met in the use of Edmodo, both students and teachers are neutral in their perspective of whether the said challenges can be considered as problems. However, both agree that they often encounter technical problems when using Edmodo. Students also agree that their poor connectivity is also contributory to their interrupted taking of online quizzes and submission of outputs. Teachers also find this as a hindrance in their preparation and uploading of online activities/resources.
SOP 5. In general, the students' extent of Edmodo utilization is significantly related to their perception of the platform's effectiveness in the development of their 21st century skills which consist of creativity, critical thinking, communication, collaboration and information, media and literacy skills. The more they utilize the platform regardless of the amount of

time spent per use and regardless of their purpose in accessing it, they perceive it as an effective means to develop the above-mentioned 21st century skills which are requisites for all pre-service teachers.

SOP 6. The teacher respondent's extent of utilization in general is significantly related to the challenges they encountered in using the platform. The more they use the platform for varied reasons regardless of the amount of time spent per use, the more they encounter challenges in its use.

RECOMMENDATIONS

1. Teachers utilizing Edmodo must provide tasks and activities that will provide sufficient means to enhance students' communication and collaboration. While quizzes are largely assigned to individual students, assignments and other tasks can be re-designed to allow the practice of oral communication skills and team work. Outputs may include video clips of oral presentations, interpretations, role-play, simulation and other group activities to encourage students to work with others.

2. Schools can look into the provision of stable internet connectivity since Edmodo can only be accessed online. The platform's amazing features may not be fully utilized by its users simply because of connectivity problems.

REFERENCES

[1] Urbani, Jacqueline et.al Teacher Education Quarterly Vol. 44, No. 4 pp.27-20, 2017

[2] Darling-Hammond, L. (2016). *Research on Teaching and Teacher Education and Its Influences on Policy and Practice*. Sage Journals.

[3] Sapta, A., & Maulana, C. (2017). *USE OF EDMODO IN IMPROVING SELF-EFFICACY*. INA-Rxiv Papers.

[4] Kongchan, C. (2012). How a Non-Digital Native Teacher Makes Use of Edmodo. International Conference, ICT for   Language Learning.

[5] Balasubramanian, K., V, J., & Nitin Fukey, L. (2014). *A study on "Student preference towards the use of Edmodo as a learning platform to create responsible learning environment*. 5th Asia Euro Conference 2014.

[6] Enriquez, M. (2014) Students' Perception of the Effectiveness of the Use of Edmodo as a Supplementary Tool for Learning. Paper Presented at the DLSU Research Congress 2014: Philippines. De La Salle University, Manila, Philippines. March 6- 8, 2014.

[7] Ali, Z. (2015, May). *A Case Study of Tertiary Students" Experiences Using Edmodo in Language   Learning*. International Journal of Language Education and Applied Linguistics (IJLEAL)

[8] Cavanaugh, J. (2005). Teaching Online_A Time Comparison. Online Journal of   Distance Learning Administration.

[9] Cook, J., & Jenkins, V. (2010). *Getting Started with Assessment*. University of Bath.

[10] Reasoner, C. (2017). ELEMENTARY TEACHERS' PARTICIPATION IN EDMODO AS A COMMUNITY OF PRACTICE: A PHENOMENOLOGY. Liberty University.

[11] Picciano, Anthony G., Dziuban, C., & Graham, C. (2013). Blended learning: Research perspectives. Vol.2. Routledge.

[12] Garrison, D.R. & Kanuka H. (2004) Blended Learning: Uncovering Its Transformative Potential in Higher Education.

[13] Rooney, J.E. (2003) Blended Learning Opportunities to Enhance Educational Programming and Meetings. Association Management, 55, 26-32.   Scientific Research Publishing

[14] Brady, K. P. et al., 2010. "The use of alternative social networking sites in higher educational settings: A case study of the e-learning benefits of Ning in education", Journal of Interactive Online Learning, Vol. 9, No. 2, pp. 151-170.

[15] Charoenwet, S. (2016). The Effect of Edmodo Learning Network on Students' Perception, Self-Regulated Learning Behaviors and Learning Performance. Proceedings of the 10th International Multi-Conference on Society, Cybernetics and Informatics (IMSCI 2016).

[16] Karaman, S., Yıldırım, S., & Kaban, A. (2008). Learning 2.0 is becoming widespread:Web 2.0   researches and results related to the use of educational applications in education. XIII.   Internet Conference Proceedings in Turkey

[17] Gruzd, A., Paulin, D. & Haythornthwaite, C. (2016) Analyzing Social Media and Learning Through Content and Social Network Analysis: A Faceted Methodological Approach ,3, 46-71.

[18] Bonk, C. J. & Graham, C. R. (2004). Handbook of blended learning: Global Perspectives, local designs. San Francisco, CA: Pfeiffer Publishing.

[19] Hockly, N. (2011) The digital generation. *(*Volume 65, Issue 3, pp.322–325). ELT Journal.

[20] Thongmak, M. (2013) Social Network System in Classroom: Antecedents of Edmodo (Volume 2013, Article ID 657749). Journal of e-Learning and Higher Education.

[21] Oyelere, S., Paliktzoglou, V. & Suhonen, J. (2016) M learning in Nigerian higher education: an experimental study with Edmodo. International Journal of Social Media and Interactive Learning Environments.

[22] Pardede, P. (2015). Pre-Service EFL Teachers' Perception of Edmodo Use as a Complementary Learning Tool. EFL Theory and Practice: Voice of EED UKI (Proceeding of EED Collegiate Forum 2015-2018), Edition: 1, Chapter: 3, pp.29-41. Publisher: UKI Press

[23] Colorado, J. T., & Eberle, J. (2010). Student Demographic and Success in Online Learning Environments. Emporia State Research Studies, 40 (1), 4-10.

[24] Giang, T.N. & Minh N.V. (2014). Edmodo - A new and effective blended learning solution. Paper Presented at the 2014 International Conference, Leadership and Management in Higher Education and Sustainable Development:Vietnam. Ho Minh City.July 24-25,2014.

[25] Witherspoon, A. (2011) Edmodo… A Learning Management System.

[26] Mills, K., & Chandra, V. (2011). Microblogging as a Literacy Practice for Educational Communities. Journal of Adolescent & Adult Literacy, 55(1), 35-45.

[27] Candelaria, S. & Wernicke, A. (2013) Edmodo.

[28] Paliktzoglou, V. and Suhonen, J. (2014a) 'Facebook as an assisted learning tool in problem-basedlearning: the Bahrain case',International Journal of Social Media and InteractiveLeaerning Environments, Vol. 2, No. 1, pp.85 - 100

[29] Ekici, D. I. (2017). The Use of Edmodo in Creating an Online Learning Community of Practicefor Learning to Teach Science. Malaysian Online Journal of Educational Sciences, v5 n2 p91-106 2017

[30] Yin Yin, K. , Zakariya, Z., Peng Lok, S. Y.,& Wai Bing, K. (2018). An exploratory study: collaborative problem solving with Edmodo among economics students. Sci. Int.(Lahore),30(4),619-623,2018.

[31] Tanduklangi ,A., Amrand , D. & Amri, C. (2018). Vol. 2, Issue. 3, (2018). pp. 14-24. International Journal of Information Technology and Language Studies (IJITLS).

[32] Batsila, M., Tsihoudiris, Ch., Vavougios, D. (2014). Entering the web-2 Edmodo world   to   support learning: tracing teachers' opinion after using it in their classes. iJET, 9(1), 53-60

[33] Creswell, J. W., & Plano Clark, V. L. (2018). Designing and conducting mixed methods research (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

[34] Hennink, M. M. (2007). International focus group research: a handbook for the health and social sciences. Cambridge: Cambridge University Press.

[35] Beyath, O. Altinay, F. & Altinay, Z. (2018). Evaluation of the Users of Edmodo Content Management System in Secondary Education. EURASIA J. Math., Sci Tech. Ed 2018;14(7):3191–3195

[36] Chung, Aderlin & Yunus, Melor. (2021). Using Peer Modo Feedback at the Pre-   Writing Stage to Improve Year 4 Pupils' Writing Performance. Journal of Education and e-Learning Research. 8. 116-124.10.20448/journal.509.2021.81.116.124.

[37] College of Teacher Education Faculty Manual. (2019). Negros Oriental State University.

[38] Duncan, D. G., & Barczyk, C. C. (2016). Facebook's Effect on Learning in Higher Education: An Empirical Investigation. Information Systems Education Journal, 14(3), 14–28.

[39] Hadjarati, Yeyen & Arota, A & Salim, Mursalin & Odja, Abdul. (2020). Effectiveness of edmodo to improve senior high school students' creative thinking skills in momentum and impulse topics. Journal of Physics: Conference Series. 1521. 022065. 10.1088/1742-6596/1521/2/022065.

[40] Jamal, H., & Shanaah, A. (2011). The role of Learning Management Systems in Educational Environments: An Exploratory Case Study. Linnaeus University School of Computer Science, Physics and Mathematics

[41] Ngo, J. & Ngadiman, A. (2019). The Impacts of Edmodo on Students' Performance in ESP Classrooms. International Seminar on Language, Education, and Culture.

[42] Siahaan, E. B. (2020). Students' Perception of Edmodo Use as a Learning Tool. *Journal of English Teaching*, 6(n1), 12–30.

[43] Widyaningrum, Heny & Hasanudin, Cahyo & Fitrianingsih, Ayu & Novianti, Dwi & Saddhono, Kundharu & Supratmi, Nunung. (2020). The Use of Edmodo Apps in Flipped Classroom Learning. How is the Students' Creative, Thinking Ability?. Ingénierie des systèmes d information. 25. 69-74.10.18280/isi.250109.

[44] Yanti, H., Setiawan, A.W., Nurhabibah, & Yannuar (2018). Teacher's Perception about the Use of E Learning/Edmodo in Educational Activities. *IOP C Conference Series:Materials Science and Engineering, 306*.

[45] Kim, H. J., Yi, P., & Hong, J. I. (2020). Students' Academic Use of Mobile Technology and Higher-Order Thinking Skills: The Role of Active Engagement. Education Sciences, 10(3), 47. MDPI AG.

[46] Akatsuka, Y. (2020). Promoting Critical Thinking Skills in an Online EFL Environment. *Journal of Pan-] Pacific Association of Applied Linguistics*, *24*(2), 95–113.