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Implementation of the Components of Synchronous and Asynchronous Learning as A Predictor to Students' English Achievement

Journal of Electrical Systems

Abstract: - The purpose of this study, was to find out the extent of implementing the components of synchronous and asynchronous learning in English. It was specifically designed to ascertain the profile of the respondents in terms of their gender and age, to determine the extent of implementing the components of synchronous and asynchronous learning in English subject particularly in terms of dialogue, structure, autonomy, and transactional distance, to determine the students' level of achievement in their English subject, and to find out if the implementation of the components of synchronous and asynchronous learning significantly predict the students' achievement in English.
The study surveyed ninety-five (95) students from the College of Education. The results were analyzed using Statistical Packages for Social Sciences version 20, frequency and percentage, and mean standard deviation.

The findings indicated that majority of the respondents were female and majority of them were 20 years old. Results of the study showed that all the components of synchronous and asynchronous learning were both implemented to at least a large extent. Other findings of the study revealed that with a percentage of 47.4, most of the respondents performed satisfactory in English. Additionally, the study's findings indicated that among the components of synchronous and asynchronous learning, only "Learner-Content: Flexibility" and "Learner-Content: Formality", "Learner-Interface: Visualization", and "Autonomy: Study Habits" had significantly predicted the achievement of the students in their English subject.

Keywords: Synchronous Learning, Asynchronous Learning, Achievement

INTRODUCTION

The Corona Virus (Covid-19) pandemic has brought challenges and opportunities in the world and the Philippine educational system. While there are universities that are doing online learning in the past decades, over 100 local universities and colleges are left with traditional instructions, face-to-face learning sessions. The traditional universities have no choice but to become adaptive to the "new normal" once declared by the World Health Organization. Philippine data on the effect of the pandemic suggests that the students' populace are prone to carry the virus through interaction and travelling to and from the schools. Classes cannot be delivered in traditional ways anymore, to mitigate the spread of the virus, until a vaccine is available. This study provides information on the implementation of flexible learning procedures in Isabela State University. The synchronous delivery is consists of google meet, google classroom and zoom meeting while asynchronous course delivery is consists of modules, fb messenger and social learning group. An asynchronous mode of learning has been the most prevalent form of online learning so far because of its flexible modus operandi (Hrastinski, 2008).[10] Asynchronous environments provide students with readily available material in the form of audio/video lectures, handouts, articles and power point presentations. This material is accessible anytime anywhere via Learning Management System (LMS) or other channels of the sort. LMS is a set of tools that houses course content and provides a framework for communication between students and teachers like classroom. It is the most adopted method for online education (Parsad & Lewis, 2008).[21] Because learners are not time-bound and can response at their leisure. The opportunity of delayed response allowed them to use their higher order learning skills as they can keep thinking about a problem for an extended time. And may develop divergent thinking. The spontaneity of expression is replaced by a constructed response. Therefore, asynchronous space leads to a self-paced, independent, student-centered learning (Marphy, Rodriguez-Manzanares & Barbour, 2011).[19] Hence, asynchronous learning can scaffold students' previous knowledge with new concepts (Lin, Hong & Lawrenz, 2012).[15] Synchronous learning, on the other hand, refers to learning that takes place using google meet and zoom meeting. It provides an opportunity of teacher student and student-student interaction. Synchronous mode instills a sense of community through collaborative learning (Teng, Chen, Kinshuk & Leo, 2012; Asoodar, Atai,

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Vaezi & Marandi, 2014).[29] A synchronous virtual classroom is a place for instructors and students to interact and collaborate in real time. Lessons can be recorded and students can access and replay teacher's lectures as many times as necessary to master the material. Direct interaction with teachers and students in real time is very much like a traditional face-to-face classroom. Synchronous sessions can result in high levels of motivation to stay engaged in activities due to teacher presence (Yamagata-Lynch, 2014).[32] Instant feedback and answers can help students resolve any problems they encounter in learning. Facial expressions and tones of voice can aid them to have the human feel at a broader spectrum.

A study by Karen Swan (2001) [27] maps learners' satisfaction and perceived learning in an asynchronous mode. She finds clarity of design, interaction with instructors, and active discussions among course participants as key factors of students' satisfaction and perceived learning. Mc Brien, Cheng and Jones (2009) [16] analyze the impact of synchronous sessions on students' learning and find it a good way of reducing distance in distance education. It is important to know how students perceive their learning behavior in both media (Somenarain, Akkaraju & Gharbaran, 2010).[26]

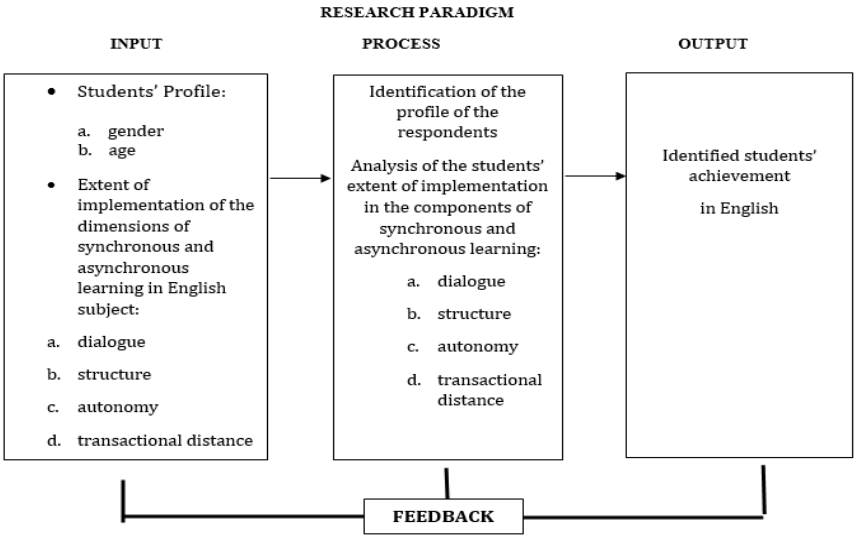
According to Wood (2005),[31] students who succeed in traditional settings may not do well in online courses. This could be attributed to student motivation, self-discipline, or any number of learner characteristics. Evaluating learner differences and how these differences affect one's academic performance is one way to understand the factors promoting success in the online learning environment.

In compliance with CHED Advisory No.6 that mentions Stringent Social Distancing Measures (SSDM) adapting flexible learning and other alternative modes of delivery instead of in-campus learning. Current online course has been prevalent today. Full online learning has been available in teaching all the academic subjects in the university. The ECQ promoted this opportunity to the university and the marginalized students will not be left behind.

However, as synchronous and asynchronous learning become the 2020 norm throughout Philippine academia especially in higher education institutions, the faculty and students have implemented synchronous and asynchronous teaching/learning. This prompted the researcher to conduct a study to provide some insights into this educational COVID 19 Pandemic. Additionally, it is intended to ascertain the extent of implementation of the components of synchronous and asynchronous learning in English.

The Study's Framework

Three frames served as a guide for the study. The first frame is the input which is the students' profile in terms of gender and age and the components of synchronous and asynchronous learning as elements affecting their achievement in English. The process of identifying the level of their academic achievement in English is critical in this study, as achievement is predicted in terms of the extent implementation of the components of synchronous and asynchronous learning in their English subject.



Objectives of the Study

The study sought to find out the extent of implementation of the components of synchronous and asynchronous learning in English. Specifically, it aimed to ascertain the profile of the respondents in terms of their gender and age, to determine the extent of implementing the components of synchronous and asynchronous learning in English subject particularly in terms of dialogue, structure, autonomy, and transactional distance, to determine the level of achievement of the students in their English subject, and to find out if the implementation of the components of synchronous and asynchronous learning had significantly predicted the students' achievement in English.

METHODOLOGY

Research Design

Quantitative research method was utilized to explore whether the extent of implementation of the components of synchronous and asynchronous learning had significantly predicted the achievement of the students in their English subject.

Participants

The study's respondents were ninety-five (95) teacher education students majoring in English responded to the online survey (google form). It included seventy-two (72) female students and twenty-three (23) male students.

Instrument for Collecting Data

The researcher utilized questionnaire answered by the respondents online through google form to gather the data needed for the study. The questionnaires were composed of two parts: The first part is the profile of the respondents and the second part is survey questionnaire adapted from Moore's Theory of Transactional Distance, a survey designed specifically to determine the extent of implementation of the components of synchronous and asynchronous learning in English subject on dialogue, structure, learner autonomy, and transactional distance. The four (4) components consist of eighty-five (85) items; twenty for dialogue, thirty-five for structure, ten for autonomy, twenty for transactional distance. The items are rated on a seven-point Likert scale ranging from "strongly agree (7) to strongly disagree (1)". It was validated by experts. Final grades were also obtained by the researcher as secondary data for the study.

Data Gathering Procedure

To collect the most critical data, the researcher followed the following phases and procedures.

1. Permission was obtained from the management of the College of Education to serve as the study's focal point.

2. Administered questionnaires to respondents through google forms, which include the following:

a. Respondents characteristics

b. An 85-item questionnaires on student's perception of online and offline courses

3. Retrieved responses of questionnaires.

The following mean and interpretation were used to determine the respondents' extent of implementation of the components of synchronous and asynchronous learning in relation to the elements specified in the questionnaire.

Mean	Description
1.00 to 1.49	To an extremely small extent
1.50 to 2.49	To a very small extent

2.50 to 3.49 To a small extent

3.50 to 4.49 To a moderate extent

4.50 to 5.49 To a large extent

5.50 to 6.49 To a very large extent

6.50 to 7.00 To an extremely large extent

Statistical Analysis

Statistical Packages for Social Sciences version 20 was used to analyze the data gathered. Frequency and percent were used to determine the frequency distribution of the respondents as to gender and age and their institutional grades. Mean and Standard Deviation were used to gauge the students' perception of the extent of the implementation of the components of synchronous and asynchronous learning in their English subject. Based on the 7-point scale instrument, the Mean scores which represent the extent of implementation were interpreted as follows: 1.00 to 1.49 was "To an extremely small extent"; 1.50 to 2.49 was "To a very small extent"; 2.50 to 3.49 was "To a small extent"; 3.50 to 4.49 was "To a moderate extent"; 4.50 to 5.49 was "To a large extent"; 5.50 to 6.49 was "To a very large extent"; while 6.50 to 7.00 was "To an extremely large extent".

Prior to the conduct of a regression analysis, the institutional grades were converted into percent using the formula Percent Grade = –12(Institutional Grade) + 111, and all the data were assessed whether they met normality assumption. The two-step data transformation technique introduced by Templeton (2011) was used to normalize all the data. The results of the data normalization are displayed in **Table 2**. Both Kolmogorov-Smirnov and Shapiro-Wilk tests confirmed that all the data entered into the regression function were approximately normally distributed.

RESULTS AND DISCUSSION

Table 1: ***Frequency and Percentage Distribution of Respondents Based on their Profile***

Profile	Categories	*Frequency (N=95)*	*Percentage*
Gender	Male	28	29.5
	Female	67	70.5
Age	19 y/o	8	8.4
	20 y/o	44	46.3
	21 y/o	34	35.8
	22 or above	9	9.5

Table 1 summarizes the respondents' characteristics in terms of their gender and age. As revealed, majority of the respondents are female (67 or 70.5%) and male (28 or 29.5%). This indicates that female respondents outnumber male ones in terms of their age, which is also listed in table 1, the majority of them were 20 years old (44 or 46.3%). This is followed by 21 years old (34 or 35.8%), students who were 22 years old or above (9 or 9.5%) and 19 years old (8 or 8.4%). The results indicated that a sizable portion of them were 20 years old (44 or 46.3%).

A study conducted by Colorado and Eberle (2010) [6] entitled "Student Demographics and Success in Online Learning Environment" asserted that Understanding the role of student demographics in the online learning environment can assist institutions to make decisions regarding online programs. These decisions go beyond the initial question of whether to invest in online programs or whether to increase or decrease online course availability. This article discusses the relationship between student demographics and success in online learning environments as it relates to academic performance and the possession of self-regulated learning characteristics. Understanding the role of student demographics in the online learning environment also would help institutions

understand what resources need to be allocated toward support of online learning programs in the form of online advising and technical support for students, course development support for faculty, and investing in learning-management software or collaboration software.

Table 2: ***Test of Normality After the 2-step Data Transformation Technique***

Variables	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Learner-Instructor Interaction	.056	89	.200*	.996	89	.992
Learner-Learner Interaction	.050	89	.200*	.987	89	.494
DIALOGUE	.034	89	.200*	.997	89	.998
STRUCTURE	.020	89	.200*	.998	89	1.000
Learner-Content	.029	89	.200*	.998	89	1.000
Learner-Content: Flexibility	.038	89	.200*	.997	89	.999
Learner-Content: Formality	.049	89	.200*	.992	89	.863
Learner-Interface	.050	89	.200*	.993	89	.898
Knowledge of Media Use	.052	89	.200*	.971	89	.073
Choice of Media	.062	89	.200*	.975	89	.089
Visualization	.080	89	.200*	.959	89	.066
Functionality	.091	89	.200*	.968	89	.075
Usability	.087	89	.200*	.966	89	.059
AUTONOMY	.041	89	.200*	.995	89	.982
Independence of Learning	.055	89	.200*	.989	89	.659
Study Habits	.084	89	.164	.987	89	.520
TRANSACTIONAL DISTANCE	.026	89	.200*	.998	89	1.000
Learner-Instructor Transactional Distance	.042	89	.200*	.997	89	.999
Learner-Learner Transactional Distance	.055	89	.200*	.986	89	.489
OVERALL	.024	89	.200*	.997	89	1.000
Percent Grades	.024	89	.200*	.998	89	1.000

Finally, a linear standard regression analysis was conducted in order to assess the predictive ability of the extent of implementation of synchronous and asynchronous learning in terms of dialogue, structure, autonomy, and transactional distance, on students' academic achievement in English.

This study was guided by Moore's (1997) [17] transactional distance theory, which was created in response to the growing field of distance education. The theory states that transactional distance in online learning is a function of dialogue, structure and learner autonomy.

Table 3: ***Extent of Implementation of the Dimensions of Synchronous and Asynchronous Learning in English Subject***

Components	*M*	*SD*	Description
DIALOGUE	5.59	.958	To a very large extent
a) Learner-Instructor Interaction	5.43	1.000	To a large extent
b) Learner-Learner Interaction	5.74	1.029	To a very large extent
STRUCTURE	5.47	.992	To a large extent
a) Learner-Content	5.50	1.007	To a very large extent
• Flexibility	5.48	1.013	To a large extent
• Formality	5.54	1.094	To a very large extent
b) Learner Interface	5.41	1.037	To a large extent
• Knowledge of Media Use	5.60	1.141	To a very large extent
• Choice of media	5.49	1.098	To a large extent
• Visualization	5.41	1.050	To a large extent

• Functionality	5.22	1.211	To a large extent
• Usability	5.20	1.175	To a large extent
AUTONOMY	5.33	.935	To a large extent
a) Independence of Learning	5.40	1.021	To a large extent
b) Study Habits	5.23	1.008	To a large extent
TRANSACTIONAL DISTANCE	5.14	.879	To a large extent
a) Learner-Instructor Transactional Distance	5.09	.919	To a large extent
b) Learner-Learner Transactional Distance	5.24	.950	To a large extent
Overall	5.40	.899	To a large extent

Table 3 shows the extent of implementation of the dimensions of synchronous and asynchronous learning in English subject. Particularly, there was a very large extent of implementation for the dialogue component (*M* = 5.59; *SD* = .958) and a large extent of implementation for the other three major components of flexible teaching and learning modalities; namely, structure (*M* = 5.47; *SD* = .992), autonomy (*M* = 5.33; *SD* = .935), and transactional distance (*M* = 5.14; *SD* = .879). Further analysis revealed that all the components of the synchronous and asynchronous learning were both implemented to at least a large extent.

Berry (2017) [5] found out in her study entitled "Educational Outcomes of Synchronous and Asynchronous High School Students: A Quantitative Causal – Comparative Study of Online Algebra 1" that there was extremely low response rate on the survey. Findings did support Moore's (1993) [18] theory of transactional distance. According to Moore's theory, courses with high dialogue and less structure, like a synchronous format, should have lower transactional distance than courses with low dialogue and high structure. Synchronous courses also require less autonomy, which increases the overall transactional distance felt. The converse is true for asynchronous courses – less dialogue, more structure, and more autonomy – which may have led to the similar mean transactional distance scores between the two groups.

Table 4: ***Achievement Level of the Students in their English Subject***

Grade	Institutional Remark	*Frequency (N=95)*	*Percentage*
1.75 or above	Very Satisfactory	11	11.6
2.00	Satisfactory	45	47.4
2.25	Good	30	31.6
2.50	Fairly Good	9	9.4

With a percentage of 47.4 as indicated in table 4, most of the respondents performed satisfactory in English, 31.6 percent are good, followed by 11.5 percent who are very satisfactory and 9.4 percent are fairly good. The results indicated that the majority of respondents performed satisfactory in English.

Leshea (2013) [14] in her study "The Effects of Synchronous Class Sessions on Student's Academic Achievement and Levels of Satisfaction in an Online Introduction to Computer Course", results showed that non-synchronous group of students scored higher than the synchronous group on the final exam. One such related study conducted by Jung, Choi, Lim, and Leem (2002), investigated the effects of three types of interaction on learner achievement, satisfaction, participation, and attitude toward online learning in a Web-based Internet (WBI) environment. The researchers looked at three different types of interaction: academic, collaborative and social. Social interaction involves the use of strategies to promote interpersonal encouragement or social integration. The results indicated that the social interaction group outperformed the other groups in terms of student achievement (Jung et al., 2002). The researchers concluded that social interaction with instructors is important in enhancing learning and active participation in online discussion. In regards to academic achievement, the differences between these three groups was significant, with the mean score of the Academic Interaction group at 67.35, the Social 74 Interaction group at 87.30, and the Collaborative at 75.09 (Jung et al., 2002). Unlike the current study, the differences in these groups were greater than a full letter grade for academic achievement. This clearly indicates that social interaction positively impacted students' levels of achievement.

Table 5 *Predictive ability of the extent of implementation of synchronous and asynchronous learning on English performance*

Model	Standardized Coefficients Beta	t	Sig.
(Constant)		94.315	.000
DIALOGUE	0.006	.961	.340
Learner-Instructor Interaction	0.008	-1.094	.278
Learner-Learner Interaction	0.013	-1.351	.181
STRUCTURE	0.001	.637	.526
Learner-Content	0.042	1.940	.056
• Flexibility	0.094*	-2.186	.032
• Formality	0.105*	-2.279	.026
Learner Interface	0.003	.832	.408
• Knowledge of Media Use	0.002	.785	.435
• Choice of Media	0.002	-.822	.414
• Visualization	0.231**	-2.871	.005
• Functionality	0.001	-.720	.474
• Usability	0.008	-1.071	.288
AUTONOMY	0.068	-1.962	.054
Independence of Learning	0.046	1.779	.080
Study Habits	0.109*	2.312	.024
TRANSACTIONAL DISTANCE	0.009	-1.236	.221
Learner-Instructor Transactional Distance	0.046	1.776	.080
Learner-Learner Transactional	0.011	1.286	.203
OVERALL	0.00	-.165	.870

Note. * means significant at .05 level

** means significant at .01 level

The summary of regression analysis on the effect of the extent of implementing synchronous and asynchronous learning components on students' achievement in English is shown in table 5. It is illustrated that among the components of synchronous and asynchronous learning, only "Learner-Content: Flexibility" and "Learner-Content: Formality", "Learner-Interface: Visualization", and "Autonomy: Study Habits" had significantly predicted the students' achievement in their English subject.

Leshea (2013) [14] concluded that social interaction involves dialogue, and dialogue is one of the three main components of the Transactional Distance Theory which served as the foundation for this study. The Transactional Distance Theory was developed by Michael Moore, who argued "One of the major determinants of the extent to which transactional distance will be overcome is whether dialogue between learners and instructors is possible, and the extent to which it is achieved" (as cited in Gorsky & Caspi, 2005, p. 3). The three main components of The Transactional Distance Theory are dialogue, structure, and learner autonomy (Gorsky & Caspi, 2005, p. 3). Moore described dialogue as the process of each contributor building on the contributions of the other party. He further explained that the direction or purpose of the dialogue should be to move toward the improved understanding of the student (Gorsky & Caspi, 2005, p.3). Moore's third component, learner autonomy, should also be an area of focus for further research. In regards to learner autonomy, Moore emphasizes that it is the learner who is playing the active role in determining the goals, learning experiences, and evaluation decisions (Gorsky & Caspi, 2005, p. 3). According to Moore and Kearsley (1996), students enrolled in courses that incorporate high levels of dialogue, including ongoing dialogue from the instructor, experience less transactional distance (Moore & Kearsley, 1996, p. 27). [18]

CONCLUSIONS

Based on the result of the study, it is revealed that the majority of the respondents are female and majority of them were 20 years old. All the components of synchronous and asynchronous learning were both implemented to at least a large extent. With a percentage of 47.4, most of the respondents performed satisfactory in English. Among the components of synchronous and asynchronous learning, only "Learner-Content: Flexibility" and "Learner-Content: Formality", "Learner-Interface: Visualization", and "Autonomy: Study Habits" had significantly predicted the achievement of the students in their English subject.

RECOMMENDATIONS

To improve students' achievement in English the College must use the following measures: enhancement of instructional resources such as modules, provide students with readily available material in the form of audio/video lectures, handouts, articles and power point presentations, teaching students to self-regulate their learning, better measures for student readiness in synchronous and asynchronous classes, better learning management systems to track students learning. More chances for teachers to participate in trainings, webinars and workshops should be provided to help them develop their teaching abilities using synchronous and asynchronous teaching modalities. Additional study is also needed in conjunction with these findings.

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