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EXPLORING STUDENTS' ATTITUDES TOWARDS ONLINE-BASED LEARNING SYSTEM IN THE NEW NORMAL: AN EXPLORATORY FACTOR ANALYSIS

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Abstract:
The implementation of online learning modality in the "New Normal Education" shifted the track of education institutions across the globe from conducting face-to-face classes to holding online-classes. The study presented in this paper aimed to explore students' attitude towards online-based learning system in the "New Normal" education. Specifically, it investigated the factor structure and the level of attitudes of 200 students towards online-based learning system. This study utilized a mixed method of research utilizing in-depth interview and a dimension reduction technique through Principal Component Analysis. Results revealed that, attitudes toward online-based learning system is multidimensional exploring eight dimensions namely: Engagement, Convenience, Satisfaction, Technology Acceptance, Adaptability, Interaction, Self-Regulation and Control. Moreover, the level of attitudes of students revealed a high level of convenience, technology acceptance, adaptability, interaction, assessment satisfaction, self-regulation and control and a moderate level of student engagement. Thus, the researchers recommend a training proposal for teachers as well as recalibrating the result of the study utilizing Confirmatory Factor Analysis.

Keywords: student's attitude, online-blended learning, new normal education

1. Introduction

With the outbreak of COVID-19 pandemic, many schools, colleges and universities across the globe have shifted to online learning to strictly follow health protocols. However, the implementation of this learning modality posed different risks, problems and challenges

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to students and other educational stakeholders, especially in the higher education institutions (Bao, 2020). While this could be the case, future research should consider learners' perceptions and attitudes regarding online learning to discover the difficulties faced by students (Mailizar, Almanthari, Maulina & Bruce, 2020).

Globally, most countries have temporarily closed their educational institutions which has affected more than 1.2 billion learners worldwide (UNESCO, 2020). With the adoption of online-based learning, most students get easily bored and show dissatisfaction due to several factors such as environmental influence (Wijaya, Zhou, Parnama & Hermita, 2020) lack of stable internet connectivity (Chua, Sibbaluca, Miranda, Palmario, Moreno & Solon, 2020) and financial crisis and mental pressure (Ramij & Sultana, 2020). Students from countries like Indonesia (Wijaya et al., 2020), India (Gaur, Mudgal, Kaur & Sharma, 2020) and Pakistan (Adnan & Anwar 2020) experienced similar issues in dealing with online learning up-to-date. Hence, Basilaia & Kvavadze (2020) proposed that the nature of online learning in consideration of students' attitude should be explored in future studies.

In the Philippines, the closure of schools has affected more than 28 million learners as revealed by the United Nations Educational, Scientific, and Cultural Organization (2020). With the increasing number of confirmed cases based on the Department of Health (2020) online tracker report, higher institutional education opted to utilize online learning system. However, some students have shown little to no interest learning in an online environment due to lack of resources and training. With this, colleges and universities have struggled with accommodating the abrupt change from face-to-face to online learning (Chua et al., 2020).

Locally, a study conducted at the University of Mindanao Digos College revealed that students have positive and negative experiences in their learning with regards to the asynchronous instruction (Diez et al., 2021). It is on the above context that the researchers would like to explore the attitudes of students when it comes to online learning in the new normal in the context of University of Mindanao Digos College. The findings may give insights to educational stakeholders about the dimensions of students' attitudes that influence their learning in an online environment. With this, existing policies can be assessed to address effective online learning in the new normal.

2. Objectives

This study aims to explore the attitude of students receiving online learning in the new normal. Specifically, it sought to answer the following objectives:

1) Determine the factor structure of student's attitudes towards online-based learning system in the new normal setting.
2) Determine the level of attitudes of students towards online-based learning system in the new normal.

3. Method

This study utilizes a mixed method approach using descriptive qualitative and quantitative techniques. Mixed method is an approach to inquiry that combines or associates both qualitative and quantitative forms of research (Creswell, 2009). Specifically, this study utilizes exploratory design of research. This design is a two-phase approach that begins qualitatively, for exploring a phenomenon, followed by the quantitative data collection phase. Moreover, a descriptive research was also employed to obtain information through determining the nature of a situation as it exists at the time of the study.

This study was conducted at the University of Mindanao-Digos College, an institution located in the Southern part of the Philippines. In employing the data gathering procedure, a qualitative data collection was gathered first followed by the quantitative data. In selecting the participants of the qualitative study, the following inclusion criteria are strictly followed: (1) the participant must be officially enrolled in the institution in the SY 2020-2021; (2) that the participant is officially enrolled in the institution for at least one (1) semester; (3) has attended online classes in the institution; (4) willing to be interviewed, (5) willing to be the representative of the program being enrolled. After the rigorous process of selecting the participants, a total of 13 participants coming from different departments were selected. In-depth Interview using google meet was used in obtaining the qualitative data. In analyzing the qualitative data, Collaizi's (1978) method of analysis was used. Identified themes were taken and constructed as the questionnaires to be used in the quantitative phase. A total of 93 items were constructed and undergo reliability test to determine the factors needed in the study. These 93 items were given to 200 respondents of the study. The selection of the respondents was similar to the selection of participants in the qualitative phase, except that respondents only answer the questions using survey questionnaire via google forms.

After obtaining the data, the factorability of the items was examined prior to the extraction of the factors. Several tests were performed to assess the suitability of the respondent data for factor analysis. These tests include Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. The KMO index ranges from 0 to 1, with 0.50 considered suitable for factor analysis and the Bartlett's Test of Sphericity should be significant ($p<.05$) for factor analysis to be appropriate (Hair et al., 1995). Thus, based on the employment of these tests, the KMO measure appeared to be more than adequate with a sampling adequacy measure of 0.943. To assess the internal reliability of the data set, Cronbach's alpha was also administered and the result revealed a ratio of 0.989 which is considered to be very high. Meanwhile, Bartlett's test of sphericity measures 21975.225 and Bartlett's coefficient ($p=0.000$) is held significant. Given these overall findings, factor analysis was deemed suitable to be performed on the data.

4. Result and Discussion

Table 1 shows the factor structure of attitudes of students towards online-based learning in the context of UMDC. Using principal component analysis, the underlying dimensions of the 93 attitude-related items were identified and the questions were grouped accordingly resulting to the retained eight-factor groups. The factor pattern from the eight retained factors was then transformed through varimax rotation. In assessing the practical significance of standardized factor loadings, Tapia (1996) indicated that for a sample size of exactly or more than 200 respondents, the factor loadings must be 0.4 or higher to consider the item significant. With this, item 42 (*Some applications like Google Meet, Zoom, do not irritate me when it gets huge amount of data*) was eliminated because its load falls below 0.4 and thus, failed to meet the minimum criteria.

The reliability of the eight-factor groups was further tested by means of Cronbach's coefficient of reliability. The alphas for the first four factors represent excellent internal consistency as supported by a very high Cronbach's alpha statistics that verifies a high reliability of the attitude groups.

Table 1: Factor Analysis of the Attitude Towards Online – Based Learning System in the New Normal

Item No.	Item	Component							
		1	2	3	4	5	6	7	8
39	The tasks that we are having right now compared to the task that we've had at face to face setting are easier and not demanding.	.524							
47	I don't feel any pressure brought by other workloads.	.540							
50	Feedback in this online set-up is faster.	.507							
58	Online learning is fun.	.673							
59	I can still learn online if I just read.	.505							
60	I haven't been bored learning online.	.784							
61	I am never irritated of this online learning.	.760							
62	I can avoid cheating online.	.682							
63	I don't search answers in the Google.	.688							
64	I have relaxed because of this online class.	.776							
65	I am not stressed in learning online.	.779							
67	I can really say that online learning is conducive for learning.	.797							

68	I have showed my full potential in this online setting compared to when I was in face to face setting.	.698							
69	I feel that it is easier online compared to the face-to-face.	.830							
70	I became more independent in this online learning than before.	.715							
71	I have learned much in this online set-up.	.789							
72	In this online learning, I'm always studying.	.783							
73	In this online learning, I expected a broader learning that is not just shared learning but also self-learning.	.540							
74	I think online learning in general is not a burden to us students.	.814							
75	In online learning, I am not tempted to scroll on various applications.	.769							
76	The adjustment in online learning was never tough.	.847							
77	Online learning is not tiring.	.829							
78	My study habits haven't changed. It's just like I am attending school.	.803							
79	This whole online learning did not become teacher-centered.	.765							
80	Online learning is not frustrating especially during exam.	.752							
81	Even with an online class, I still understand something.	.585							
82	Online learning gives satisfaction in this new normal setting.	.785							
83	With this online set-up, I can really say that you will learn something.	.748							
84	There are no distractions while learning online.	.810							
85	Online learning does not make every student very lazy.	.791							
87	Online learning is manageable so students can adjust.	.672							
88	Online learning is somehow engaging and exciting because this is new to me.	.698							
89	Online learning is not stressful and not challenging as I have a stable internet connection	.726							

91	Online learning is more convenient depending on the factors.	.656							
92	The school provides print outs or fact sheets that we can read everytime we are not using gadgets.	.633							
01	In this online learning, my teachers are really understanding.		.578						
02	The meeting with the teachers is done everyday.		.491						
03	All course facilitators in this online learning religiously teach.		.626						
04	The teachers have fun and engaging strategies and techniques while teaching online.		.601						
05	Discussion in online learning is engaging		.684						
06	The course facilitators exert an effort in reaching out to us in this online set-up.		.698						
07	Teachers are really trying their best so we can understand.		.792						
08	Teachers give the right grade that I deserve while doing my tasks.		.676						
09	Teachers deliver their lessons through the use of the technology and various applications.		.724						
10	The delivery of instruction from the course facilitators is good.		.739						
11	All instructors are easy to understand whether in the group chat or in the Google meet.		.685						
12	Teachers are doing their best somehow to cope with the problems that we are experiencing when it comes to the platform.		.811						
13	I expected that the LMS has no problems at all.		.614						
14	I expected that there are no glitches in using the LMS.		.600						
15	The LMS is effective in starting this online set-up.		.650						
16	It is just easy once we understand how the software works.		.663						
17	Quipper is really satisfactory.		.562						
18	The Quipper has no limitations and there is no need to be developed about the software		.543						

19	Letters in the Powerpoint uploaded in Quipper are legible.		.687						
20	The LMS is convenient.		.620						
21	I understand the materials that are being uploaded online.		.700						
22	The flow and the instructions are organized so the students easily catch up.		.678						
23	I can still learn through the support of the uploaded materials if I have the reliable internet		.581						
24	It is not annoying when teachers send us video tutorials which just also came from Youtube.		.598						
25	I expected psychomotor activities rather than cognitive assessments.		.575						
26	I expected a lot of performance activity to be different not just essays and other very basic tasks.		.610						
28	The assessment is not tough.			.557					
29	The assessment online is not stressful.			.513					
30	I can manage my time well since the assessment posted by my teachers online has deadlines.			.521					
31	Activities are interesting because it's always different.			.540					
32	The assessment is easier because almost everything is available online.			.544					
33	I'm not pressured because of time limit while answering my assessments.			.657					
34	The teachers thoroughly discuss the question that has been given in the Quipper.			.595					
35	The ideas given by the teacher are all in the exam.			.657					
36	The exams were discussed by the teacher.			.672					
37	The assessment is never exhausting because the teachers provide sufficient time.			.639					
49	I have received a feedback from the instructors since the start of this online-based learning.			.490					
52	The topic of my classmates and I does not revolve on the frustrations from our professors			.429					

	and the hassle of all the works which need to be done.								
38	I need to be more independent and responsible in doing the tasks given by the teacher.				.490				
40	I am now expert in using the technologies.				.646				
41	There's no problem with the applications since all are working or are compatible in other devices.				.553				
43	Technologies can transform learning into a more fun, engaging and meaningful one.				.624				
44	Technology is useful in this new normal.				.805				
45	Technology in this whole online set-up contributes to my learning progress.				.763				
46	Technology is somehow helpful, engaging, purposeful and meaningful.				.777				
48	I have expected that the teachers will give feedback.				.510				
51	I believe that feedback really plays an important role in shaping the progress of the students in this online set-up.				.603				
53	I think my classmates and I have resonated with each other now that we are receiving online learning.				.435				
66	I'm trying my best to learn something and explore out of this technology learning.					.539			
86	Before the online class started, we were briefed during the orientation about the learning portals that we will be using.					.553			
93	Face-to-face is better because teachers can still teach even without internet connection.					.709			
54	In terms of the connection with the classmates, it's better now in this online set-up.						.547		
55	Our teamwork is getting stronger this time.						.499		
57	I have a good communication with my friends.						.670		

90	Online learning system allows student to be independent in exploring new ideas online.							.418	
56	My classmates and I are not copying because it's strict.								.406
27	The class assessment in the online setting is strict and hard and is not easy to cheat on.								.510
Eigenvalue		46.702	7.305	3.594	3.147	1.890	1.644	1.519	1.197
% Variance		50.22	7.86	3.86	3.38	2.03	1.77	1.63	1.29
Reliability by Cronbach α		0.984	0.973	0.958	0.932	0.700	0.781	-	0.777
Cronbach $\alpha = 0.989$									
KMO = 0.943									
Bartlett's Test of Sphericity Chisquare = .000									

Meanwhile, the alphas for the next factors were considered to have good internal reliability showing values above 0.7 (Cronbach, 1951). It can be noted that Factor 7 did not indicate a reliability value since this factor only has 1 item and running a reliability test was deemed not possible. Furthermore, the eigenvalues and percentage of variance were also identified to guarantee the appropriateness of the items as indicators of the factors. The eigenvalues should be greater than one (eigenvalues > 1) as those eigenvalues less than one accounts for less variability and thus, are not retained in the analysis (Girden, 2001).

Upon reviewing the items and examining the result, the first factor has indicated 35 items which consist of Item_39, Item_47, Item_50, Item_58, Item_59, Item_60, Item_61, Item_62, Item_63, Item_64, Item_65, Item_67, Item_68, Item_69, Item_70, Item_71, Item_72, Item_73, Item_74, Item_75, Item_76, Item_77, Item_78, Item_79, Item_80, Item_81, Item_82, Item_83, Item_84, Item_85, Item_87, Item_88, Item_89, Item_91 and Item_92 with a very high internal consistency of 0.984 and a high level of importance as it revealed 50.22% of the total variance and has an eigenvalue of 46.702. This factor involves the general experiences of students towards online learning from attitudes, reflection, to management of their own learning. Thus, this dimension was named *Engagement*.

The second factor consisted of 26 items in the data set. It has a very high reliability of 0.973 and accounts for the total variance of 7.86% and an eigenvalue of 7.305. Included in the items are Item_1, Item_2, Item_3, Item_4, Item_5, Item_6, Item_7, Item_8, Item_9, Item_10, Item_11, Item_12, Item_13, Item_14, Item_15, Item_16, Item_17, Item_18, Item_19, Item_20, Item_21, Item_22, Item_23, Item_24, Item_25 and Item_26. This factor discusses how students were able to perform tasks through the aid of various modes of instruction. Thus, this factor was named *Convenience.* Meanwhile, the third factor has a total variance of 3.86% and an eigenvalue of 3.594. Upon the inspection of the items, 12 items were included which displayed a reliability of 0.954. These items are Item_28, Item_29, Item_30, Item_31, Item_32, Item_33, Item_34, Item_35, Item_36, Item_37, Item_49 and Item_52. This factor involves the feelings and attitudes of students regarding

their assessment stating that the assessment is not tough and stressful and emphasizing the role of feedback, among others. Thus, this dimension was named *Satisfaction*.

The fourth factor indicated 10 items which displayed a very high reliability of 0.932. These items include Item_38, Item_40, Item_41, Item_43, Item_44, Item_45, Item_46, Item_48, Item_51 and Item_53. The total variance accounts for 3.38% and has an eigenvalue of 3.147. This factor involves students' acknowledgement of the use of technology in this online learning. Thus, this dimension was named *Technology Acceptance***.**

The fifth factor contained 3 items from the data set which consist of Item_66, Item_86 and Item_93 and has an internal reliability of 0.700. It has 2.03% of the total variance and an eigenvalue of 1.890. This factor involves adjusting to online learning by trying their best and learning how this modality will be accessed. Thus, this dimension was named *Adaptability.*

Going further, the sixth factor included 3 items in the data set. Items include Item_54, Item_55 and Item_57. It has a good reliability of 0.781 and accounts for the total variance of 1.77% and eigenvalue of 1.644. This factor involves the connection and communication of students over their peers while learning online. Thus, this dimension was named *Interaction*.

The seventh factor with only Item_90 has a total variance of 1.63% and an eigenvalue of 1.519. This factor involves management of learning through independently exploring ideas online. Thus, this dimension was named *Self-regulation.*

Lastly, the eighth factor included 2 items in the data set particularly Item_56 and Item_27. It has a good reliability of 0.777 and has a total variance of 1.29% and an eigenvalue of 1.197. This factor involves control of students towards their actions in the learning environment particularly with regards to their assessment. Thus, this dimension was named *Control.*

Table 2: Level of Attitude towards Online – Based Learning System in the New Normal by Factor

Factor	**Mean**	**SD**
Engagement	3.14	0.90
Convenience	3.73	0.70
Satisfaction	3.45	0.84
Technology Acceptance	3.80	0.69
Adaptability	3.84	0.76
Interaction	3.57	0.85
Self-regulation	3.45	0.96
Control	3.50	0.96
Overall	3.56	0.83

Based on the result of the conducted factor analysis, it can be revealed that the grouping of the attitude items into various factors is statistically justified. Table 2 shows the level of attitude of students towards online-based learning system in the new normal. Attitude of students explored eight factors namely: engagement, convenience, assessment

satisfaction, technology acceptance, adaptability, interaction, self-regulation and control. The results showed that the level of attitude of students obtained an overall mean of 3.56 (SD=0.83) with a descriptive level "high". This indicates that the attitude of students towards online-based learning system in the new normal is satisfactory.

A. Adaptability

The adaptability dimension of attitude towards online-based learning system in the new normal obtained the highest mean score of 3.84 (SD=0.76) among all factors. As indicated in the data, the overall mean for the level of adaptability of students was verbally described as high. Based on the responses, the respondents perceived that they were briefed during implementation of the new modality of learning. They were oriented about the learning portals and they are trying their best to learn something and explore out of this technology learning.

B. Technology Acceptance

The technology acceptance dimension of attitude towards online-based learning system in the new normal obtained a mean of 3.80 (SD=0.69). As indicated in the data, the overall mean for the level of technology acceptance of students was high. Based on the result the respondents acknowledged the usefulness of technology-based learning.

C. Convenience

The convenience dimension of attitude towards online-based learning system in the new normal obtained a mean of 3.73 (SD=0.70). As indicated in the data, the overall mean for the level of satisfaction was high. The respondents displayed favorable responses among sub-items.

D. Interaction

The interaction dimension of attitude towards online-based learning system in the new normal obtained a mean of 3.57 (SD=0.85). As indicated in the data, the overall mean score for the level of interaction was high. Based on the result, the respondents have felt a strong bond among their peers. These include: have a good communication with friends; teamwork is getting stronger this time; and the connection with the classmates is better in online set-up.

E. Control

The control dimension of attitude towards online-based learning system in the new normal obtained a mean of 3.50 (SD=0.96). As indicated in the data, the overall mean for the level of control was high. Based on the result, respondents have showed good management over their own learning particularly with regards to dealing with their assessment. Respondents perceived that class assessment in the online setting is strict and hard and is not easy to cheat on and that they were not copying due to strict assessment implementation.

F. Satisfaction

The satisfaction dimension of attitude towards online-based learning system in the new normal obtained a mean of 3.45 (SD=0.84). Respondents perceived that the assessment is easier because almost everything is available online, the exams were discussed by the teacher, the ideas given by the teacher are all in the exam, they have received a feedback from the instructors since the start of this online-based learning, the teachers thoroughly discuss the question that has been given in the Learning Management System (LMS), the assessment is not tough, they are not pressured because of time limit while answering assessments and the assessment online is not stressful.

G. Self-regulation

The self-regulation dimension of attitude towards online-based learning system in the new normal obtained a mean of 3.45, (SD=0.96). As indicated in the data, the overall mean for the level of self-regulation of students was high. Based on the result, respondents perceived that online learning allowed them to be independent in exploring new ideas online. It can be concluded that they were able to monitor their progress as they receive online education.

H. Engagement

The engagement dimension of attitude towards online-based learning system in the new normal obtained the lowest mean score of 3.14 (SD=0.90) among all factors. As indicated in the data, the overall mean for the level of engagement of students was moderate. Students have identified their experiences while receiving online learning. Interpretation of the result shows that attitude of students towards online learning is moderately satisfactory.

Based on the result of the study, the finding was found to be significantly below the threshold. Moreover, the level of students' engagement towards online-based learning system in the new normal is moderate obtaining the lowest mean score among all present factors.

5. Conclusion

Based on the findings of the study, the authors concluded that: The attitude of students towards online-based learning system in the new normal is multidimensional. The factor structure revealed eight factors, namely: Engagement, Convenience, Assessment Satisfaction, Technology Acceptance, Adaptability, Interaction, Competence and Control. Moreover, the level of attitude of students towards online-based learning system in the new normal in the context of the University of Mindanao Digos College is of a high level of convenience, technology acceptance, adaptability, interaction, satisfaction, self-regulation and control and a moderate level of engagement.

6. Recommendation

The researchers recognized that the implications of their findings are only confined to the limits at which they interpret the results, and that these limitations must be addressed. Thus, in the light of foregoing findings and conclusions, the following recommendations are offered:

1) The study found out a moderate level of engagement among respondents of all academic departments. The researchers therefore recommend that administrators may evaluate and improve the effectiveness of existing policies and may implement necessary actions in addressing effective online learning in the new normal.
2) Training and workshop may be proposed to the faculty particularly on discussing interventions to improve their management, pedagogical and technical skills.
3) Based on the responses of the participants which revealed their educational needs, a focused-group discussion can be conducted to students to further discuss their learning struggles and difficulties while receiving online learning.
4) The researchers also recommend to further recalibrate the result of this study to address the limitations of this research. A confirmatory factor analysis can be done by future researchers to confirm the dimensionality of attitudes toward online-based learning system. Factor analysis can be utilized to validate the existing and present factors which served as dimensions of attitude towards online learning.

Conflict of Interest Statement
The authors declare no conflicts of interests.

About the Authors

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