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E-Learning Engagements of Pre-Service Education Students

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Abstract

This study aimed to ascertain the e-learning engagements of selected Pre-service Education students and determined whether the e-learning engagements vary based on the students' profile variables. The study group of the survey comprised 275 first to third-year students of BSED-Sciences, BTVTED and BSED-Mathematics enrolled at Surigao State College of Technology (SSCT), City Campus. A researchers-made questionnaire was used, validated and tested for reliability using Cronbach Alpha internal consistency coefficient with (α=0.85) for the entire scale (20 items). Distribution of web-based questionnaires thru Google forms followed. The data collected were treated using frequency, percentage count, mean, standard deviation, and analysis of variance (ANOVA). A descriptive survey research design was also employed. Study results indicated that behavioral, social, cognitive and technological engagements of the students were generally positive. Particularly, social engagement rated very high with a mean score of 2.97 (SD=0.53) indicating a significantly higher influence towards the learner's online engagement meanwhile, technological engagement rated a lowest mean value of 2.71 (SD=0.55) signifying that students' e-learning engagements is lesser as unstable internet connection found to be the main technological problem which caused students to get frequent absences during online classes. Additionally, mobile phone devices revealed to be the most useful ICT tool to assist students' in managing the online learning system. Moreover, the e-learning engagements were

found not to vary based on students' sex and family income. However, students' age, year level, program and specialization and gadgets used in modular and online classes made a significant difference which shows that the profile differences of Pre-service education students contribute a direct effect towards their online learning engagement. Implications from the results recommend a need to sustain social interaction between stakeholders, increased students' online resources and community support by provision of learners' online learning demands.

Keywords: *E-Learning Engagements, Pre-service Education students, Descriptive Study*

A. INTRODUCTION

Due to the threat of COVID-19 pandemic, distance education has becoming popular and the need to continue learning in the Philippines have resorted the Higher Educational Institutions (HEIs) to adopt online classes or E-learning classrooms to deliver the content of their curriculum in various platforms (Chua et al., 2020).

With the full adoption of e-learning, challenges and issues more specifically in students' engagements have surfaced. Based from early studies, student engagement defined as a single dimension of the behavioral aspect. Meanwhile, Robinson (2012) emphasized student engagement as the active involvement of students, as a collective, regarding matters related to students' experience.

The fact that students made adjustments in the online learning system, students' engagement could possibly be affected as the abrupt change from face-to-face to online learning reveals difficulty with accessing technological resources of faculty members and students (Chua et al., 2020). In point of fact, a change in instruction has also changed the student engagement as online learning is a very challenging environment for developing self-regulated capacities (Dabbagh & Kitsantas, 2004).

Identification of student engagement in e-learning has been attracting increasing amounts of attention. As suggested by Dixon (2015) the factors

of engagement in online learning include skills, emotion, participation and performance. In the same line, Reading (2008) discussed some student engagement indicators group by behavioral, emotional and cognitive engagement in the ICT-rich learning environments. The same basis of indicators in measuring e-learning engagements used by Lee et al., (2019) which are composed of behavioral, cognitive and emotional factors.

Although there have been many studies regarding the student engagement, few studies have been dedicated to delving into the e-learning engagement of higher education students, particularly in the Philippine educational context. Moreover, several studies were limited in that the level of student engagement is mostly measured by behavioral, cognitive and emotional indicators.

To fill in this gap, the researchers identified four e-learning engagements which are the behavioral, social, cognitive and technological and sought to determine the significant difference between the engagement's indicators and the learners' profile variables.

The cited engagement indicators were adopted from various student engagement researches. Specifically, behavioral and cognitive engagement were determined from the study led by Lee et al., (2019). Also, social engagement was anchored from the study conducted by Elumala et al., (2020) and technological engagement was identified from the research study of Gunuc & Kuzu (2014) on the factors influencing student engagement and the role of technology in student engagement in Higher Education: Campus-Class-Technology Theory.

In this paper, engagement indicators were defined as behavioral refers to the preparedness, efforts and positive qualities exhibited by students in learning meanwhile, cognitive entails students' acquisition of knowledge, application of learning and how they are able to generate further knowledge based from what they have learned in online discussions. Furthermore,

social engagement refers to the sustained interaction of students to significant others and technological factor points out the student's ability to have full access to e-learning materials, have the necessary technological resources and also encompasses their ability to manipulate technologies used in their e-learning.

Hence, identification of engagements' indicators may help determine whether their total involvement in the online learning system is positive or negative.

B. METODH

A descriptive survey research design was utilized in this study to describe the significant difference between the indicators and the students' profile variables. The identified indicators of this research which includes the behavioral, social, cognitive and technological were adopted from various student engagement researches. Specifically, behavioral and cognitive indicators were determined from the study led by Lee et al., (2019). Also, social engagement was anchored from the study conducted by Elumala et al., (2020) and technological engagement was identified from the research study of Gunuc & Kuzu (2014) on the factors influencing student engagement and the role of technology in student engagement in Higher Education: Campus-Class-Technology Theory.

The research respondents were drawn from three specializations under Teacher Education Program namely the Bachelor of Technical-Vocational Teacher Education (BTVTED), Bachelor of Secondary Education Major in Sciences (BSED-Sciences) and Bachelor of Secondary Education Major in Mathematics (BSED-Mathematics) students who were officially enrolled for the school year 2020-2021 at Surigao State College of Technology, City Campus.

Table 1
Distribution of the Respondents

PROGRAMS	Actual (N)	Sample (n)	Actual x %
BSED-SCIENCES			
1st	30	24	80.00
2nd	33	27	81.82
3rd	31	25	80.65
N=	94	n= 76	80.85
BSED-MATHEMATICS			
1st	39	30	76.92
2nd	35	26	74.29
3rd	49	37	75.51
N=	123	n= 93	75.61
BTVTED			
1st	31	22	70.97
2nd	38	28	73.68
3rd	77	56	72.73
N=	146	n= 106	72.60
Overall N=	363	n= 275	75.76

There were 363 total populations across all year levels and specializations. Computing the representatives of the population, Krejcie and Morgan's (1970) sample size calculation was utilized and determined 275 students to partake in the study. Moreover, random sampling method was applied to accurately determine the respondents' chances of being selected in the sample.

The researchers-made questionnaire consisted of the demographic profile of the respondents (Part I) and the four factors affecting their e-learning engagements (Part II) which composed of five items per factor (Appendix A). Prior to distribution, the survey questionnaire was validated by research experts and tested for reliability. Using Cronbach Alpha internal

consistency coefficient with (α=0.85) for the entire scale (20 items) suggests that the items in the survey instrument have high internal consistency value and are highly correlated (Appendix E). Therefore, it is appropriate for use in this longitudinal research.

The researchers asked permission from the Vice-President of the Academic Affairs in conducting the said study (Appendix B). Moreover, the researchers wrote a letter addressing to the Dean of Teacher Education to ask a soft copy of the officially enrolled BTVTED, BSED-Sciences and BSED-Mathematics students from first to third year in this academic year 2020-2021 (Appendix C). Upon the approval of the person in authority, the researchers administered the web-based survey questionnaires over the social media in particular to Facebook and contact respondents to answer the Google forms.

The data collected from the students' responses in the Google forms was tallied and analyzed by the researchers using frequency count and percent distribution to describe the respondents' profile as to sex, program and specialization, year level, family income, and gadgets used in modular and online classes; weighted mean and standard deviation were used to determine the factors affecting the e-learning engagements of the students; analysis of variance (ANOVA) was utilized to treat the significant difference on the engagement indicators as to the learners' profile variables.

C. RESULT AND DISCUSSIONS

On the Profile of the Respondents

Table 2 presents the profile of the respondents in terms of age, year level, program and specialization, sex, family income and gadgets used in modular and online classes.

Table 2
Frequency and Percent Distribution of the Respondents According to their Profile

Profile Variables (n=275)		Frequency	Percentage (%)
Age	18-21 years old	219	79.6
	22-25 years old	51	18.6
	26-29 years old	3	1.1
	30 years old above	2	0.7
Year Level	1st Year	76	27.6
	2nd Year	78	28.4
	3rd Year	121	44.0
Program & Specialization	BSED Sciences	76	27.6
	BSED Mathematics	93	33.8
	BTVTED	106	38.6
Sex	Male	89	32.4
	Female	186	67.6
Family Income	3,000 and below	107	38.9
	3,001-7,000	93	33.8
	7001-10,000	44	16.0
	10,001 and above	31	11.3
Gadgets Used	Mobile Phone	247	89.8
	Laptop	24	8.7
	Personal Computer	1	0.4
	Ipad	1	0.4
	Mobile Phone & Laptop	2	0.7

In terms of age, it can be gleaned that out of 275 individuals, the majority (219 or 79.6%) were among the age group of 18-21 years old meanwhile, age brackets of 26-29 years old and 30 years old above had the least number of respondents, 3 and 2 (1.1% and 0.7%), respectively. As to the year level, there were more students coming from the third-year level which comprises 121 (44.0%) of the total respondents, compared to second year and first year levels which had only 78 and 76 (28.4% and 27.6%), distributively.

The same Table shows that BTVTED program outnumbered the other programs across year levels, where 106 respondents corresponded to 38.6% of the total population. Meanwhile, the remaining 33.8% and 27.6& were covered by the BSED-Mathematics and BSED-Sciences, correspondingly. Furthermore, on the base of sex that out of 275 respondents, 186 (67.6%) were females and 89 (32.4%) were males.

With respect to the family income, majority of the respondents (107 or 38.9%) belonged to the range of 3,000 and below indicating that most of the students came from low-income households. The reason for this may have been that Surigao State College of Technology is a public tertiary institution offering tuition-free education hence, may help students from low-income families to continue their higher education despite of pandemic. Perna et al., (2017) supported the result that free college help improve affordability, increase educational attainment and support student financial aid.

Lastly, as to gadgets used in modular and online classes, 247 (89.8%) respondents out of 275 used mobile phones which imply that majority of the population utilized this ICT learning tool in their e-learning engagements and an indicative that this type of gadget was the most useful device to assist them in their online learning. This finding was supported by Ally and Wark (2018) that mobile devices can enhance learning with clear benefits such as affordability and portability. Moreover, one of their research findings showed that 539 respondents out of 695 indicated that they used mobile devices for learning. Meanwhile, laptop was the second most used by the respondents, which accounted 8.7% and usage of personal computer (PC) and Ipad scored the same frequency count of 1 (0.4%) which entailed that these gadgets were not likely used by the students.

On the Students' E-Learning Engagements

Table 3 indicates the students' e-learning engagements in terms of behavioral, social, cognitive and technological.

Table 3

Students' E-Learning Engagements

ENGAGEMENT INDICATORS	Mean	SD	Verbal Interpretation
BEHAVIORAL ENGAGEMENT	2.81	0.50	Agree
Show up confidently to every class on time.	2.70	0.62	Agree
Attend both synchronous and asynchronous classes with motivation and preparedness.	2.78	0.61	Agree
Plan ahead and manage my time to meet school-related deadlines.	2.88	0.69	Agree
Approach new learning tasks with confidence and a positive attitude.	2.85	0.62	Agree
Demonstrate interest in learning and participate in class discussions.	2.90	0.60	Agree
SOCIAL ENGAGEMENT	2.97	0.53	Agree
Contribute to the team effort by sharing information, resources, and expertise.	3.09	0.60	Agree
Work well with classmates on online projects or assignments.	3.03	0.69	Agree
Interact with the instructors during the online learning engagements and ask clarification on difficult lessons.	2.83	0.68	Agree
Ask classmates for help when I can't understand a concept taught.	3.09	0.72	Agree
Communicate openly with parents or relatives on all academic-related concerns.	2.81	0.82	Agree
COGNITIVE ENGAGEMENT	2.89	0.50	Agree
Deeply analyze thoughts, experiences and theories about the knowledge I have learned in my online classes.	2.87	0.54	Agree
Derive new interpretations and ideas from the knowledge I have learned in courses discussions.	2.91	0.58	Agree
Evaluate the value of information related to the knowledge learned in my online classes.	2.93	0.57	Agree
Apply the knowledge gained from online discussions to real problems or new situations.	2.90	0.66	Agree
Answer religiously all activities by studying the concepts and generating further knowledge.	2.88	0.62	Agree

TECHNOLOGICAL ENGAGEMENT	2.71	0.55	Agree
Able to manipulate e-learning platforms such as google meet, zoom, edmodo, google classroom and etc.	3.00	0.65	Agree
Access to any technological learning resources such as mobile phones, laptops, tablets, wifi, etc.	2.83	0.70	Agree
Manage my own learning using the online system.	2.66	0.69	Agree
Able to take online classes with stable internet connection.	2.27	0.78	Disagree
Complete tasks creatively using ICT gadgets such as laptops, tablets and etc.	2.78	0.72	Agree

As shown in the Table, all of the items expressing the behavioral aspect of student obtained a uniform response which verbally interpreted as Agree indicating that the students' behavior shows influence into his or her e-learning engagement. The behavioral engagement drawn an average mean value of 2.81 (SD=0.50) and was verbally described as Agree.

The statement "Demonstrate interest in learning and participate in class discussions" got the highest mean value of 2.81 (SD=0.60) with a verbal interpretation as Agree, which means that students displayed willingness to be engaged in e-learning courses discussions and established a positive level of effort that is dedicated to learning and invested energy for task completion. On the other hand, both statements "Attend both synchronous and asynchronous classes with motivation and preparedness" and "Show up confidently to every class on time" scored lower obtaining a mean value of 2.78 (SD=0.61) and 2.70 (SD=0.61), distributively and were verbally described as Agree. This implies that students still elicit persistence, participatory behavior and attitudes which result a positive demonstration towards learning in an ICT-rich environment despite scoring low.

This result was supported by Lee et al. (2019) that learning management emphasizes behavioral engagement in which learners manage their own learning during active learning participation in online courses. Similarly,

Parkes et al. (2013) claimed that engagement in the e-learning environment can appear as behavior characteristics, such as eliminating distractions in the environment during the online class, managing learning using the online system, and managing the learning schedule by taking a lecture plan when taking the online class.

It can be gleaned in the same Table, where the social engagement obtained an average mean value of 2.97 (SD=0.93) and was verbally described as Agree. Particularly, each item under such indicator was verbally interpreted as Agree. This result implies that social interaction encourages greater e-learning engagement of students. Both statements "Ask classmate for help when I can't understand a concept taught" and "Contribute to the team effort by sharing information, resources, and expertise" got the highest mean value of 3.09 (SD=0.72 and SD=0.60), correspondingly and were verbally interpreted as Agree. These indicated that fostering interaction with classmates such as requesting extra help and communicating openly can be considered as an important predictor of student engagement in e-learning. The same results revealed from the study of Kolloff (2011) that student to student interaction is vital to building community in an online environment, which supports productive and satisfying learning and helps students develop problem-solving and critical thinking skills.

On the other hand, items "Communicate openly with parents or relatives on all academic-related concerns" and "Interact with the instructors during the online learning engagements and ask clarifications in difficult lessons" obtained a respective mean value of 2.81 (SD=0.82) and 2.83 (SD=0.68) with verbal interpretation, Agree. Despite scoring low, among of all items of social engagement, it had still proved that communicating with the instructors and family members helped learners to be motivated in their academic endeavors. This result was supported by Jung and Lee (2018)

that in the e-learning environment, the level of engagement is higher when the learners sense a teaching presence that they feel in the actual learning field with the professor. Additionally, Borup et al., (2015) investigation of parental engagement in online instruction found parents working with the child to help develop perseverance, locus of control, organizational and time management skills, and overall parental guidance through online learning activities.

As to the cognitive indicator, it obtained an average mean value of 2.89 (SD=0.50) and was verbally interpreted as Agree. This result delineated that cognitive factor is an important indicator which affects students' learning engagement as it represents the process of acquiring, evaluating and utilizing knowledge. Both statements, "Evaluate the value of information related to the knowledge learned in my online classes" and "Derive new interpretations and ideas from the knowledge I have learned in courses discussions" have closer mean values of 2.93 (SD=0.57) and 2.91 (SD=0.58) and were described as Agree. These can be attributed that the respondents were determined to learn and try to put in practice what they have learned in their online classes.

Finally, the technological engagement obtained an average mean value of 2.71 (SD=0.55) and was verbally described as Agree. Specifically for item, "Able to manipulate e-learning platforms such as goggle meet, zoom, edmodo, goggle classroom and etc." got the highest mean value of 3.00 (SD=0.65) indicating that students have the knowledge to utilize such platforms recommended by the administration and instructors may be because they have enough experience to use such tools since they were already using the technology since last semester as the institution gradually adopting to e-learning system. However, indicator "Able to take online classes with stable internet connection" scored the lowest mean value of 2.27 (SD=0.78) and was verbally described as Disagree. This result implies

that most of the students have difficulty in attending online classes both synchronous and asynchronous due to the reason of weak internet reception especially those students situated at far flung areas. Also, students owned mobile devices and other ICT gadgets have no internet connection due to high cost and the unavailability of Internet services at their homes. In fact, similar findings from the study led by Jibrin et al., (2017) that 21% of the respondents reported that they encountered the problem of slow internet speed which results to low academic engagement and which hindered students' online learning. Similarly, slow Internet connections or limited access from homes in rural areas can contribute to students falling behind academically, according to a new report from Michigan State University's Quello Center.

On the Significant Difference between Factors and Students' Profile Variables

Table 4 reveals the difference between behavioral factor according to students' profile variables.

Table 4

Difference between E-Learning Engagements and Students' Age

Engagement	F-value	p-value	Decision to Ho	Interpretation
BEHAVIORAL	0.83	0.477	Not Rejected	Not Significant
SOCIAL	2.08	0.103	Not Rejected	Not Significant
COGNITIVE	3.04	0.029	Rejected	Significant
TECHNOLOGICAL	0.53	0.664	Not Rejected	Not Significant

Legend: $\alpha < 0.05$ Significant; $\alpha > 0.05$ Not Significant

As shown from the results in Table 4, students when clustered in terms of age, analyses showed that it made no significant difference with the e-learning engagements namely the behavioral, social and technological

where its p-values obtained were greater than 0.05 level of significance which were strong predictors that the null hypothesis is accepted thus, qualitatively described as "Not Rejected".

On the contrary, students' age revealed a significant difference on the cognitive engagement ($p < 0.05$) along with an F-value of 3.04. This implies that age variable has main effect on the cognitive aspect of the students towards their engagement in e-learning. This can be attributed that younger or older students may vary on their cognitive approach to become academically engaged in online discussions. This finding was supported by Al-Mutairi (2011) that younger students had a tendency to perform better than mature students in a college setting. As learning strategies and mental investments are particularly what students employed to be cognitively engaged, experts have found out that learning preferences in online have posed relationship to students age, where younger students preferred interactive online learning activities while, older students preferred to learn from recorded tapes (Simonds & Brock, 2014a). Additionally, Simonds and Brock (2014b) claimed that age, experience and exposure toward different online activities have a significant influence on students' participation and choices of activities.

Similar results revealed from the study of Dibiase and Kidwai (2010) on adult professionals (ages 22-65) and undergraduate students (ages 19-30) taking an online geography course that the adult professionals, on average, scored much higher on quizzes than the undergraduate students. These were strong indicators that students at certain age brackets differ on how they use self-regulating strategies, metacognitive approach on contents and learning tasks particularly in achieving desired learning goals and outcomes.

Table 5
Difference between E-Learning Engagements and Students' Year Level

Engagement	F-value	p-value	Decision to Ho	Interpretation
BEHAVIORAL	5.80	0.003	Rejected	Significant
SOCIAL	0.17	0.843	Not Rejected	Not Significant
COGNITIVE	2.14	0.120	Not Rejected	Not Significant
TECHNOLOGICAL	0.22	0.805	Not Rejected	Not Significant

Legend: $\alpha < 0.05$ Significant; $\alpha > 0.05$ Not Significant

Table 5 shows the difference between the four engagement indicators of the students' e-learning engagements and their year level. The analysis revealed that learners' year level did not cause a difference in social, cognitive and technological indicators ($p > 0.05$); while a significant difference was found between Pre-service education students' year level and behavioral factor ($p < 0.05$). This implies that educational level has contributed a direct effect on the behavioral aspect of the students towards their academic engagement in e-learning. This can be attributed that learners with varying educational year levels display different behavioral approach which draws the idea of participation, self-regulation, online academic involvement and positive level of effort.

This was supported from the findings of Yu (2021) that post graduates and undergraduates reported varying preferences for online learning approach as they thought e-learning could provide freedom for their self-regulated capacities in learning. Similarly, Evans (2014) proved that the postgraduates have higher stronger self-regulation and could keep their learning behaviors under control than those of undergraduates.

Table 6
Difference between E-Learning Engagements and Students' Program & Specialization

Engagement	F-value	p-value	Decision to Ho	Interpretation
BEHAVIORAL	4.36	0.014	Rejected	Significant
SOCIAL	0.07	0.932	Not Rejected	Not Significant
COGNITIVE	1.35	0.261	Not Rejected	Not Significant
TECHNOLOGICAL	0.22	0.802	Not Rejected	Not Significant

Legend: $\alpha < 0.05$ Significant; $\alpha > 0.05$ Not Significant

It can be gleaned in the Table 6 that of the e-learning engagements, only behavioral component revealed a significant difference on the students' program and specialization where its p-value scored 0.014 below the determined 5% margin of error. This shows that the online programs taken by students made impact on their behavioral engagement. It could be signified that BSED-Sciences, BSED-Mathematics and BTVTED exhibited varying level of online participation, confidence and sustained effort which are predictors of student behavior and attitude in their online learning approach. Recent research has indicated that student engagement varies from one learning situation to another Poysa et al., (2019) which means that the behavioral engagement differs from the type of programs a student is enrolled into. This lend support from the research of Garcia et al., (2021) that basic and intermediate Vocational Education and Training (VET) students in Spain which are enrolled in different types of programs and qualifications revealed differences in behavioral engagement where students in IVET had greater behavioral engagement than BVET students.

Table 7
Difference between E-Learning Engagements and Students' Family Income

Engagement	F-value	p-value	Decision to Ho	Interpretation
BEHAVIORAL	1.12	0.342	Not Rejected	Not Significant
SOCIAL	0.72	0.540	Not Rejected	Not Significant
COGNITIVE	0.55	0.649	Not Rejected	Not Significant
TECHNOLOGICAL	0.54	0.658	Not Rejected	Not Significant

Legend: $\alpha < 0.05$ Significant; $\alpha > 0.05$ Not Significant

The Table shows the difference between e-learning engagements and students' family income. It can be viewed that there were no significant differences existed between behavioral, social, cognitive and technological indicators and financial status when students were clustered to ($p > 0.05$). It was also described as "Not Rejected" indicating that the null hypothesis is accepted which also showed that ranges of household income of students had equal levels of perceived engagements in digital learning. Moreover, it can be suggested that it did not influence the total student engagements in the online learning system. This determined that students elicit involvements in online discussions, communicate with significant people when facing learning difficulties, incorporate willingness to exert effort in mastering concepts or developing skills and able to use online platforms, improve technical skills and could manage online learning system without the direct influence of students' financial income backgrounds. It can be supported that, as student engagement positively predicts academic achievement (Lei & Cui, 2018), Adzido et al., (2016) posited that though family income affects students' performance to some extent, but it is not an essential predictor of higher academic performance. In one of their findings, a good number of student respondents indicated that low family income does not necessarily lower their academic achievement for the responsible and serious students; low family income must not be an excuse for poor performance.

Table 8
Difference between E-Learning Engagements and Students' Sex

Engagement	F-value	p-value	Decision to Ho	Interpretation
BEHAVIORAL	0.09	0.33	Not Rejected	Not Significant
SOCIAL	0.41	0.523	Not Rejected	Not Significant
COGNITIVE	0.03	0.874	Not Rejected	Not Significant
TECHNOLOGICAL	1.01	0.315	Not Rejected	Not Significant

Legend: $\alpha < 0.05$ Significant; $\alpha > 0.05$ Not Significant

It can be gleaned in Table 8, the difference between four indicators of e-learning engagements and student sex as profile variable. Findings revealed that there were no significant differences existed between variables ($p > 0005$) which are an indicative that males and females showed equal e-learning engagements when grouped according to sex. This result was supported by Korlat et al., (2021) where boys and girls in competencies beliefs showed no differences indicating equal levels of perceived abilities towards in digital learning. Similarly, Vekiri and Chronaki (2008) showed equality between boys and girls with respect to managing digital learning, using technologies and technical equipment to complete school-related tasks performed in digital learning format. Research finding of Nistor (2013) suggested that were no gender significant differences in learning outcomes because males were more stable in attitudes, while females performed well in engagement. Furthermore, no significant gender differences in learning outcomes were found based on learning styles. There were also no significant gender differences in the learning satisfaction of online millennial learners (Harvey et al., 2017).

Table 9
Difference between E-Learning Engagements and Students' Gadgets Used

Engagement	F-value	p-value	Decision to Ho	Interpretation
BEHAVIORAL	3.93	0.004	Rejected	Significant
SOCIAL	3.74	0.006	Rejected	Significant
COGNITIVE	5.66	0.000	Rejected	Significant
TECHNOLOGICAL	4.33	0.002	Rejected	Significant

Legend: $\alpha < 0.05$ Significant; $\alpha > 0.05$ Not Significant

Table 9 reveals the difference between the e-learning engagements and students' gadgets used in modular and online classes. ANOVA results indicated that there were significant differences found when students were grouped according to what gadgets they used in managing the digital system towards each factor ($p > 0.05$). However, social engagement highly differed significantly (p-value= 0.06) among other factors and cognitive component rated the lowest difference score of 0.000. This implies that gadgets used contribute an effect on the determined factors which measured the e-learning engagements of students. Usage of mobile phones, laptops and other ICT tools impact how students elicit academic involvement in the online setting which includes the means to use them for activities and engagements.

This result was supported by Gunuc & Kuzu (2014) that majority of the students reported that technology use helped increase engagement if effectively use into class meanwhile, could decrease engagement when not appropriately integrated from the class. In this respect, the role and influence of the factor of technology contribute to the participatory behavior and students' motivation in their classes when it is used appropriately. Hence, students feel motivated through the use of specific technology whether it be for pedagogical purposes or for accommodations (Francis, 2017). Additionally, Darko (2019) claimed that a positive usefulness of the use

smartphones in the students learning activities such as easy sharing and accessing of lectures materials online, easy communication with colleagues and course masters, and etc.

Moreover, mobile gadgets found to improve maximum proficiency levels and have shown significant factor in education (Fauzi, n.d.).

D. CONCLUSIONS

Based on the findings, several conclusions were drawn: (1) with the adoption of online learning system, mobile phone devices revealed to be the most useful ICT tool to assist students' in managing the online learning system (2) the e-learning engagements of Pre-service Education students which include the behavioral, social, cognitive and technological were positive, particularly, social engagement rated very high which shows that the student interaction among stakeholders helped establish good e-learning engagements of students. However, technological issues pertaining to unstable internet connection found to negatively affect the students which may cause them to get absences during online classes and learners' drop outs are foreseeable with this outcome and lastly, (3) there were significant differences found between the factors and the students' profile variables specifically in students' age, year level, sex, program and specialization and gadgets used in modular and online classes indicating that the profile differences of Pre-service education students contribute an effect to their e-learning engagements. However, no significant differences existed between the factors and the students' sex and family income signifying that they display similar e-learning engagements without getting affected with their gender differences and financial status when grouped into.

In this study, it is recommended that the students' parents, instructors and classmates must continue to establish social interaction so that the learner

may get motivated and could rightly seek help to significant people when facing learning difficulties. Furthermore, the government, the institution and the community should partner in establishing learning avenues where students have full access to quality internet connectivity and has the basic tools in e-learning that could motivate the students to become academically engaged, lowering the probability of frequent absences which may lead to students' drop outs. Maximizing student engagement would be extremely helpful in providing meaningful online learning experiences among the students.

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