

Predictive Influence of ICT Utilization on Homework Completion of Secondary School Students in Nsukka, Enugu, Nigeria

Ikusika, Bamidele Adunola

**Department of Applied Science, Federal College of Dental Technology and Therapy,
Trans-Ekulu, Enugu**

Correspondence to: Ikusika, Bamidele Adunola Email: sehindele@gmail.com

Abstract

Background: Homework completion that is guided by the use of ICT is an area of education research that is less often focused. This kind of research is especially needed at the secondary school level, as students at this level (relative to students at the elementary level) are expected to engage more with homework, since research have identified a strong association with academic achievement among secondary school students, relative to those at the elementary level.

Objective: The study aimed to investigate the predictive influences of ICT utilization on the extent of homework completion of secondary school students in Nsukka, Enugu, Nigeria. The study equally adopted the basic premises of the decomposed theory of planned behaviour to explain secondary school students' motivation for utilizing ICTs in their extent of homework completion.

Methodology: A survey research design as well as a multistage sampling approach was adopted to elicit data from 200 senior secondary school students in Nsukka Education Zone.

Results: The level of ICT literacy, students' attitude (e.g., perceived usefulness, the perceived ease of use and compatibility), subjective norms (pressures from peers and family members and teacher's supervision) and self-efficacy were important factors mediating the influence of students' ICT use and their extent of homework completion in the secondary schools that were studied. Technology (e.g., poor Internet network) and resource (e.g., lack of time) facilitating conditions were equally impactful on students' extent of homework completion in the secondary schools that were studied.

Unique Contribution: The identification of the predictors influencing the relationship between students' ICT utilization and the extent of their homework completion could point to the ICT educational need areas as well as suggest solutions to solving the identified problems.

Conclusion: The findings from the study have provided important insights into the motivations explaining why secondary students intend to use ICT for starting and completing their homework.

Keywords: ICT literacy, ICT utilization, homework completion, secondary school students

Background

Homework is an out-of-class task given to students to do at home. The importance of homework on students cannot be overemphasized. For example, by engaging in homework activities, students are taught to think independently and be self-disciplined. Students are also encouraged to become creative and take responsibility for starting and completing a task. Therefore, with the education system moving rapidly into information communication technology (ICT) adoption in knowledge building and transfer, the role of ICT is evidently becoming very important (Oliver, 2002). Oliver (2002) opines that this importance will continue to take preeminence in the 21st century. This is perhaps why empirical researches (e.g., Hashmi et al., 2019) have started to inform recommendations that students should undertake classroom activities with the aid of ICT. This recommendation is based on results from studies indicating the positive impact of ICT on student learning (e.g., Alderete & Formichella, 2018; Hussain *et al.*, 2017; Schindler *et al.*, 2017). For example, in their investigation of the effect of ICT on 9th graders' academic achievement and retention in Chemistry in a secondary school in Pakistan, Hussain *et al.* (2017) reported that ICT positively affected academic achievement and retention. The authors also found that ICT was more credible and effective in teaching Chemistry relative to other conventional teaching techniques. The authors concluded by calling on the authorities and schools with similar structure to adopt more of ICTs to schooling experience.

The observed influence of ICT on student learning experience does not exist in a vacuum. It must be learned and then utilized. In other words, ICT literacy and utilization are key aspects of learning. However, the extent to which students are ICT literate will determine the extent to which they utilize the technologies and subsequently impact on learning outcomes. In several studies, secondary school students' level of ICT literacy was found to be low and discouraging, impacting negatively on the use of the technology and learning outcomes (e.g., Mabayoje *et al.*, 2015; Minikutty & Sandhya, 2015). Many of these studies have equally linked the low ICT literacy levels to lack of access to ICT infrastructure such as computers and other technologies designed for learning. As an example, Mabayoje *et al.* (2015) found in their assessment of secondary school students in Kwara State, Nigeria that a relationship existed between inadequate ICT facilities and low literacy levels. ICT literacy levels have also been identified as predictor of technology use among students. Studies like that of Buabeng-Andoha and Issifu (2015) have found that ICT competencies were the strongest determinant of technology use among 3,380 secondary students across schools in Ghana. Therefore, poor ICT utilization could be accounted for in the low level ICT literacy among secondary school students. Such relationship was found in the study of Iyanda *et al.* (2016) which reported that a significant correlation existed between ICT literacy skill and technology usage pattern of library users in a college of education in Osun State, Nigeria.

Furthermore, the influence of gender on ICT literacy and utilization among students has been highlighted in several studies. Collectively, findings from these studies are inconclusive because they are mixed. While some studies have found significant gender differences in ICT literacy and use (e.g., Colley & Comber, 2003; Fraillon *et al.*, 2014; OECD, 2011), other findings have shown that gender distinctions are either negligible or non-existent (e.g., Azeta & van der Merwe, 2018; Gnams, 2021). The distinctions highlighted in many of these studies have remained unchanged in recent times (i.e., males continue to show more positive perception towards computer use relative to their female counterparts) (Gebhardt *et al.*, 2019). In their

examination of possible changes ICT perception and attitude among students (aged 11 to 15 years) in a UK school, Colley and Comber, (2003) attributed the unfavourable disposition of girls towards ICT to the culture of gender stereotyping. The importance of gender in attitude towards ICT among students is further highlighted as Colley and Comber, (2003) concluded that despite increased exposures to ICTs in schools, significant gender gap still exists. On the contrary, studies like that of Gnamb (2021) have reported negligible differences in ICT literacy between males and females across different secondary schools in Germany. The small effect size in the difference that was observed did not permit the author to conclude that girls were disadvantaged regarding ICT literacy.

In the absence of ICT facilities at schools, it has been noted that secondary school students possess portable devices such as smart phones among others. The devices are employed to meet both academic and social needs. Even though these devices can be potentially rewarding for students, unsupervised use of mobile phones could lead to undesirable outcomes. Evidences have also shown that being too young and engaging in chats that are unrelated to school activities are consequences of students non-supervision in their utilization of these devices (e.g., Aharony & Zion, 2019; Dempsey *et al.*, 2019).

Therefore, while there are numerous evidence showing that ICT literacy skills, lack of facilities in schools, gender, age, unsupervised use of ICTs, among others are predictive of academic performance, classroom activities, and other learning outcomes in schools, research is less focused on the effect of these factors on ICT use at home for school related works despite being a widespread activity in education. Research has highlighted the significant predictors of homework completion and they include learning-oriented reasons for doing homework, homework interest, and homework management (Xu, 2011). Other studies have equally suggested that gender (e.g., Harris *et al.*, 1993; Hong and Milgram, 1999; Younger & Warrington, 1996), parental influence (e.g., Patall *et al.*, 2008; Trautwein *et al.*, 2006) and students' attitude (e.g., Cooper *et al.*, 1998; Xu, 2005) towards home work play crucial role in homework completion. However, despite tons of literature as to the determinants of homework completion, there is still a huge gap with regards to what is known about how ICT utilization could impact on homework completion. In addition, empirical knowledge about the influence of ICT utilization on homework completion in the context of a developing country such as Nigeria is scanty. As a result, the present study is focused on the predictive influence of ICT utilization on homework completion of secondary school students in a Nigerian town. The study equally adopted the basic premises of the decomposed theory of planned behaviour (Taylor & Todd, 1995) to understand secondary school students' motivation for utilizing ICTs in homework completion. This kind of research is especially needed at the secondary school level, as students at this level (relative to students at the elementary level) are expected to engage more with homework (Perie *et al.*, 2005), since research have identified a strong association with academic achievement among secondary school students, relative to those at the elementary level (Cooper *et al.*, 2006; Cooper & Valentine, 2001).

Theoretical Framework

Decomposed Theory of Planned Behaviour

This study is hinged on the decomposed theory of planned behaviour. The theory was developed by Taylor and Todd (1995) as modification and an improvement on the theory of planned

behaviour which was initially proposed by Ajzen (1991). The theory attempts to describe individual behaviour using the association between beliefs, attitudes, intention, and behaviour as basis for explanation (Nyasulu & Chanwiga, 2019). In the view of Taylor and Todd (1995), attitudes, subjective norms, and perceived behavioural control are the components which help to account for variables impacting on the intentions of an individual to adopt an innovation (Nyasulu *et al.*, 2019). See also (Iyorza 2008; 2014; 2017; Iyorza, & Abu, 2020; Iyorza, & Ekwok, 2015).

As has been noted, the decomposed theory of planned behaviour was an improvement on the theory of planned behaviour by Ajzen (1991). According to Ajzen, the precursors of behavioural intentions include: attitude, subjective norm and perceived behavioural control. These fundamental drivers of intentions were further decomposed by Taylor and Todd (1995). For instance, attitude as a construct is decomposed into perceived usefulness, the perceived ease of use and compatibility. Perceived usefulness is described as the extent to which people believe that using a particular technology would improve their job performance (Davis, 1989). When placed within the context of the present study, secondary school students would most likely adopt a specific ICT if they perceive that the technology would improve their homework experience. Perceived ease of use is defined as the individual belief that using a technology would be effortless and uncomplicated (Nyasulu & Chanwiga, 2019). As a result, when secondary school students with homework responsibilities see ICT as an easy to use technology, they are likely to accept and incorporate them in their homework activities. Compatibility is defined as the degree to which technologies are suited to the existing value and experiences (Nyasulu & Chanwiga, 2019). The implication of this on secondary school students is that they are likely to adopt using technologies if they are able to incorporate them into available learning practices.

Subjective norm is decomposed into social pressure or influence applied by significant others (peers, family members and other close individuals or groups). According to Ajzen (1991), normative beliefs are concerned with social influences that make a person to put up a particular behaviour. As an example, secondary school students' adoption of ICT for homework completion might have been influenced by other students, friends in the neighbourhood, teachers, parents and others. Finally, perceived behaviour control is decomposed into the following: self-efficacy, resource facilitating condition and technology facilitating condition. The proponents of the theory defined self-efficacy as the acceptance and use of technology by individuals due to the fact that they are comfortable with themselves using it. In the context of the present study, secondary school students would use ICT for homework completion because they are comfortable with themselves using it. Regarding resource facilitating condition and technology facilitating condition, Nyasulu and Chanwiga, (2019) argued that students would possibly adopt innovative technologies if the conditions sustaining them are favourable. On the one hand, examples of resource facilitating condition in this context might involve the use of time (to spend in doing the homework) and money (to use in purchasing data to connect to the Internet). On the other hand, the availability and proper functioning of mobile technologies and strong Internet bandwidths (technology facilitating condition) help the students in their homework experience.

Previous researches incorporating the principles of the theory into the explanation of ICTs adoption abound in higher education and other fields (e.g., Chawinga & Zinn, 2015; Hastuti *et*

al., 2014; Mirghasemi, 2014; Shih & Fang, 2004). For example, in their investigation of the use of Web 2.0 technologies by lecturers in a University in Malawi, Chawinga and Zinn (2015) adopted the decomposed theory of planned behaviour. Following analysis of data elicited, the authors found that attitude and perceived behavioural control strongly influenced lecturers' use of technologies. The authors also found that technology facilitating condition (poor Internet access) affected the adoption of Web 2.0 by the lecturers. Similarly, Nyasulu and Chanwiga, (2019) used the decomposed theory of planned behaviour to investigate WhatsApp technology use among students in a Malawian University. The study found that the students' perceived benefits of using WhatsApp alongside their confidence in the use motivated the adoption and continued use of the technology. According to the findings, problems associated with WhatsApp technology adoption include costs of ICT gadgets, frequent electricity outages and unreliable Internet connection from mobile network service providers. Kanimozhi and Sundar's (2017) study was conducted in an entirely different context different from the education sector in India. According to the findings, attitude, subjective norm and perceived behavioural control significantly impacted on consumer's decision to adopt 4G mobile services.

Based on the literature reviewed above, the following hypotheses were raised:

1. **H₁**: Secondary school students' level of ICT literacy will mediate the influence of ICT utilization on the extent of their homework completion.
2. **H₁**: Gender of secondary school students will moderate the influence of ICT utilization on the extent of homework completion.
3. **H₁**: The age of secondary school students will mediate the influence of ICT utilization on their extent of homework completion.
4. **H₁**: The attitudes of secondary school students (e.g., perceived usefulness, the perceived ease of use and compatibility) will mediate the influence of ICT utilization on their extent of homework completion.
5. **H₁**: The subjective norms of students (e.g., pressures from peers and family members and teacher's supervision) will mediate the influence of ICT utilization on their extent of homework completion.
6. **H₁**: Self-efficacy of students will mediate the influence of ICT utilization on their extent of homework completion.
7. **H₁**: Technology facilitating condition and resource facilitating condition will predict students' extent of homework completion.

Methods

Participants

A survey method was used in the study. Participants were 200 senior secondary school students (SS1-3) from four secondary schools in Nsukka Education Zone, Southeastern Nigeria. Schools that were selected for the study include: Nsukka High School, Model Secondary School, Federal Government Girls' College and St. Teresa' College (all boys). Demographic distribution of the students suggests that 53.9% were male, and 46.1% were female. The mean age of the boys was 16.2 years, while the mean age for the female respondents was 15.8 years. Regardless of the gender difference, the mean age for all students in the sample was 16 years.

Procedure

A multistage sampling approach was adopted. At the first stage, the researcher employed a simple random sampling technique to select four secondary schools from the list of schools in the education zone. Furthermore, the researcher began the next stage by randomly selecting classes (e.g., SSII A, SSIII B, etc). From the classes that were selected, the researcher adopted a convenience sampling technique to approach students who showed willingness. Copies of the questionnaire were administered with the help of four research assistants who were recruited from the University of Nigeria, Nsukka campus and trained intensively for 2 weeks on how to carry out the exercise. Prior to the commencement of the study, the researcher obtained an ethical clearance from the Research Ethics Committee in the University of Nigeria Nsukka, Enugu State. Verbal consent was then sought from the study respondents after the committee reviewed and approved the study.

Materials and Measures

For the purpose of this study, ICT(s) was operationalized as a set of electronic tools, including applications (program or software) used by secondary school students to store, create, manage, store and store data or information relating to their homework. Examples of these technological tools include computer, tablet device, smart mobile phones, Internet and social media applications. Therefore, ICT literacy level was regarded as the extent to which students indicate competence and knowledge of ICT. ICT literacy level was measured using 12 different items. Respondents were asked to indicate the level of their competence and knowledge about ICT by ticking appropriate response category ranging from '1' (a very low extent) to '4' (a very high extent). For example, the first item in the scale was worded thus: "I can navigate and search the Internet". A reliable Cronbach's alpha (α) of .74 was obtained for the scale. For the present study, ICT utilization is regarded as the extent of the use of ICT for the purpose of doing class works, assignments and or homework. ICT utilization was measured on a three item scale. Response options ranged from '1' (strongly disagree) to 4 (strongly agree). An example of the items was worded like this: "I use ICTs (computer, tablet device, smart mobile phones, Internet and social media applications) to attend to my homework". Result of reliability analysis conducted on the scale showed that responses were highly consistent ($\alpha = .78$).

Furthermore, attitude towards ICT was measured on a three item scale (perceived usefulness, perceived ease of use and compatibility). Response category ranged from '1' (strongly disagree) to 4 (strongly agree). For example one of the items of the scale was worded like this: "I believe that by using ICT properly, my homework will be adequately completed to the extent that it would warrant a good grade". A reliable Cronbach's alpha (α) of .93 was obtained for the scale. Subjective norms were measured on a three item scale. They were further asked to state the extent to which they agreed that peer, family members or parents, home lesson instructors and school teacher instruction or advice influence on their ability to complete homework tasks. A Cronbach's alpha (α) of .85 was obtained for the scale and was regarded as highly reliable. Perceived behavioural control was measured alongside self-efficacy, technology facilitating condition and resource facilitating condition. Examples of the statement that was used was: "I believe that I am capable of using ICT effectively to address the concerns or issues with my homework", "power supply impacts on the way I use the ICT to effectively do my homework", "lack of money deter me from using the right ICT tool for my assignment" and "poor Internet network is an obstacle to my use of the ICT for class work and homework". A reliable

Cronbach’s alpha (α) of .92 was obtained for the scale. Finally, the extent of homework completion was measured using two items. The scale on the extent of homework completion was adapted from the study of Xu (2011) (Cronbach’s $\alpha = .71$). In the present study, secondary school students were asked to indicate how much of the homework they usually complete and the how often they come to class with their homework. The Cronbach’s alpha’s result for this scale was found to be highly reliable ($\alpha = .92$).

Data Analysis

The researcher analysed elicited data using SPSS version 23.0. A descriptive statistic, particularly percentage, mean and standard deviation were used to describe data on demographic characteristics of the students in the sample. Similarly, a series of regression analyses were carried out to investigate whether the observed effect of ICT utilization on the extent of their homework completion was mediated by the following variables: level of ICT literacy, attitude towards ICT, subjective norms and self-efficacy. The researcher employed a Macro Process in SPSS 23 to perform the mediation analyses. According to Baron and Kenny (1986), mediation would be observed when the effect of the independent variable on the dependent variable is less when the mediating variable is imputed in the regression equation compared to when the independent variable is keyed in alone. A moderation analysis was equally used, applying the same Macro Process in SPSS 23, to test whether the relationship between ICT utilization and extent of homework completion is influenced by gender and age. Finally, a simple regression analysis was conducted to ascertain the effect of technology facilitating and resources facilitating conditions on students’ extent of homework completion. The researcher employed a 1% significance level during the analysis.

Results

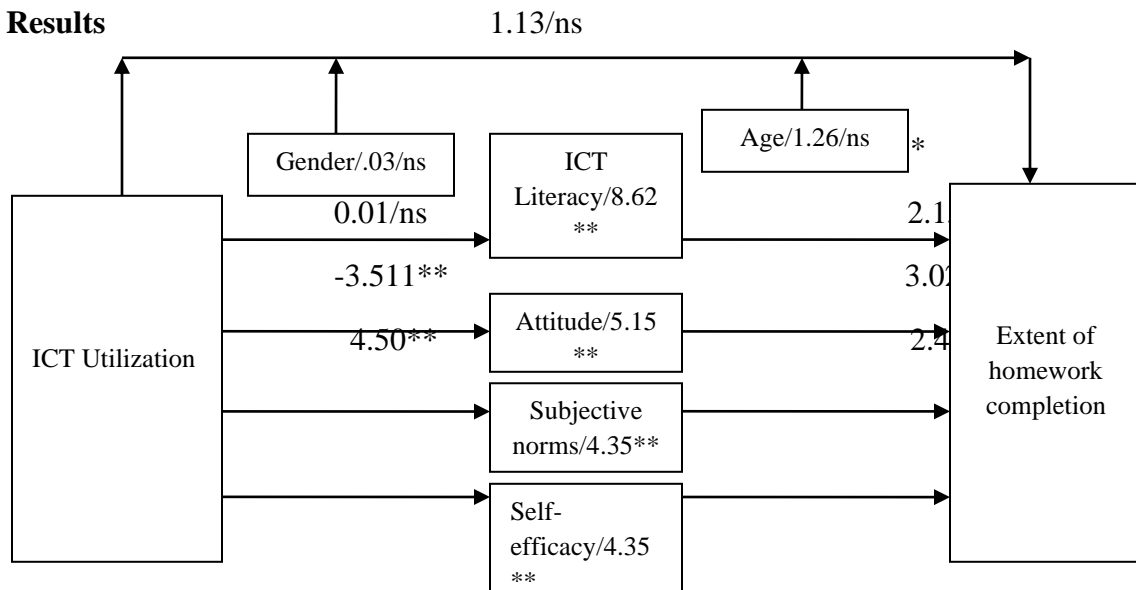


Figure 1. Mediation and moderation analyses outcomes for the effects of ICT utilization on extent of homework completion among students as mediated by ICT literacy, attitude, subjective

norms and self-efficacy and as moderated by gender and age of students. Note. ** $p < .01$, ns= not significant

H₁: Secondary school students' level of ICT literacy will mediate the influence of ICT utilization on the extent of their homework completion

Findings showed that the direct relationship between ICT utilization and homework completion was not statistically significant ($b = 1.131, t = 0.282, p = .071$). On the other hand, a positive correlation was observed between ICT utilization and extent of ICT literacy ($b = 5.145, t = 4.318, p = .001$) and literacy and the extent of homework completion ($b = 3.332, t = 5.124, p = .001$). Nevertheless, when the mediating variable (extent of ICT literacy) was included in the equation, it was revealed that the level of ICT literacy was a strong mediating factor between ICT utilization and the extent of homework completion ($b = 8.620, t = 5.206, p = .001$). This is an indication showing the significance of ICT literacy in students' utilization of ICT to complete their homework.

H₁: Gender of secondary school students will moderate the influence of ICT utilization on the extent of homework completion

Following analysis, finding reveals that gender did not significantly moderate the relationship between ICT utilization and the extent of homework completion ($b = 0.03, t = 0.073, p = .31$). This is an indication the hypothesis was not supported since being male or female did not interact between students' ICT utilization and their extent of homework completion.

H₁: The age of secondary school students will moderate the influence of ICT utilization on their extent of homework completion

Based on the analysis of this hypothesis, finding shows that age did not significantly moderate the relationship between ICT utilization and the extent of homework completion ($b = 0.15, t = 1.261, p = .089$). This suggests that the hypothesis was unsupported as a result of the absence of interaction effect of age on the relationship between students' ICT utilization and their extent of homework completion.

H₁: The attitudes of secondary school students (e.g., perceived usefulness, the perceived ease of use and compatibility) will mediate the influence of ICT utilization on their extent of homework completion

Results from the hypothesis shows that while ICT utilization did not have a significant direct effect on students' attitude (e.g., perceived usefulness, the perceived ease of use and compatibility) towards ICT ($b = 0.013, t = 0.210, p = .082$), a direct effect of attitude was found on homework completion ($b = 2.145, t = 3.211, p = .001$). Also, a mediating effect of attitude was observed on the relationship between ICT utilization and homework completion ($b = 5.153, t = 4.310, p = .000$). This result highlights the importance of students' attitude toward ICT in attending to homework activities.

H₁: The subjective norms of students (e.g., pressures from peers and family members and teacher's supervision) will mediate the influence of ICT utilization on their extent of homework completion

Findings on the fifth hypothesis reveals that a negative direct relationship exists between ICT utilization and subjective norms (pressures from peers and family members and teacher's supervision) ($b = -3.511, t = -6.214, p = .001$). This is an indication that an increase in ICT use might be leading to a decrease in pressure from peers and family members as well as teacher's supervision and vice-versa. A direct influence of subjective norms was equally observed on the extent of students' homework completion ($b = 3.021, t = 3.110, p = .001$). Subjective norms also mediated the influence of ICT use on extent of homework completion when it was added to the model ($b = 8.412, t = 6.512, p = .001$).

H₁: Self-efficacy of students will mediate the influence of ICT utilization on their extent of homework completion

Analysis of the sixth hypothesis shows that there is a positive direct correlation between ICT utilization and self-efficacy ($b = 4.503, t = 5.146, p = .000$). This result suggests that an increase in ICT utilization might lead to a corresponding increase in self-efficacy and vice-versa. Also, a direct influence of self-efficacy was noted on the extent of students' homework completion ($b = 2.421, t = 3.320, p = .001$). When self-efficacy was added to the model, the relationship between ICT utilization and students' extent of homework completion reached statistical significance ($b = 4.353, t = 5.231, p = .001$).

H₁: Technology facilitating condition and resource facilitating condition will predict students' extent of homework completion

Result of the analysis of the seventh hypothesis reached statistical significance [$F(1, 200) = 572.110, p < 0.001$]. The predictive factors accounted for 57.2% of the variation in the students' extent of homework completion. Technology facilitating condition (e.g., poor Internet network) ($b = 3.173, t = 4.215, p = .000$) and resources facilitating condition (e.g., time and or money constraints) ($b = 5.131, t = 7.313, p = .001$) were positively correlated with students' extent of homework completion.

Discussion

The study aimed to investigate the predictive influences of ICT utilization on the extent of homework completion of secondary school students in Nsukka, Enugu, Nigeria. The study equally adopted the basic premises of the decomposed theory of planned behaviour (Taylor & Todd, 1995) to explain secondary school students' motivation for utilizing ICTs in their extent of homework completion. Six hypotheses were raised to achieve these objectives. The first hypothesis was confirmed as ICT literacy was found to have influenced ICT utilization as well as the extent of homework completion among the senior secondary school students in the study. ICT literacy was also found to be of greater importance due to its mediating influence on the relationship between ICT utilization and the extent of homework completion. This finding is consistent with related studies highlighting the significance of ICT literacy on students' academic performance (e.g., Santos *et al.*, 2019). For example, Santos *et al.*'s (2019) study revealed that ICT literacy was undoubtedly a factor in the use of the Internet and school

performance among students of the 3rd cycle of basic education and secondary education (7th to 12th grades) in the district of Vila Real, Portugal. The finding from the present extends previous studies in that it focused on an important line of research (homework completion) that has often been neglected in the field of education.

The second and third hypotheses of the study stating that gender and age would moderate the influence of ICT utilization of students' extent of homework completion were not confirmed. The finding on the non-significant effect of gender and age is congruent with extant findings indicating that gender (e.g., Azeta & van der Merwe, 2018; Gnambs, 2021) and age (e.g., Voyles, 2011) distinctions in students' educational achievement are either negligible or non-existent.

Furthermore, the fourth hypothesis of the study was supported as it shows the statistical significance of attitude (perceived usefulness, perceived ease of use and compatibility) on homework completion and its mediating influence on the relationship between ICT utilization and homework completion. This finding is consistent with results of previous studies (e.g., Chawinga & Zinn, 2015; Hastuti *et al.*, 2014; Mirghasemi, 2014; Nyasulu & Chawinga, 2019; Shih & Fang, 2004) highlighting the importance of these three decomposed attitude (perceived usefulness, perceived ease of use and compatibility) on utilization of technologies in education and other fields. The finding from the present study serve as an extension of previous researches that have been conducted on various educational outcomes of students and teachers in that it looked at an unexplored area of research: homework completion. This finding is also regarded as a revalidation of a basic principle of decomposed theory of planned behaviour (Taylor & Todd, 1995). This finding has implication for education and teaching practice. By encouraging teachers (who are planning to use ICT or already adopting ICT to give out homework to secondary school students) to focus on these three factors (perceived usefulness, perceived ease of use and compatibility), they might begin to identify students who are weak and start to motivate the students them to use ICT effectively.

Findings from the fifth hypothesis were equally supported. First, it was discovered that high use of ICT led to reduced pressures from peers and family members and teacher's supervision concerning homework completion and vice versa. However, a direct effect of subjective norms was observed on the extent of students' homework completion. Subjective norms were also found to be influential on the relationship between ICT use and extent of homework completion. These findings are related to those reported in the study of Choi and Park (2020). According to the authors, subjective norms are found to have a significant effect on both desire and behavioural intention among online duty-free shop users. Nonetheless, the result of the negative relationship between ICT use and subjective norms shows that these norms could also have negative effect on ICT use if it becomes counter-productive on the students attempting to successfully complete their homework. However, the researcher believes that other factors that were not captured could help to explain the relationship between subjective norms and ICT utilization.

The sixth hypothesis stating that self-efficacy of students will mediate the influence of ICT utilization on their extent of homework completion was supported by the result. Self-efficacy was also directly impactful on ICT utilization and homework completion in the study sample. Similar effects of self-efficacy have been noted in previous studies (e.g., Chawinga & Zinn, 2015; Hastuti *et al.*, 2014; Mirghasemi, 2014; Nyasulu & Chawinga, 2019; Shih & Fang, 2004).

However, these findings could help to explain how self-efficacy as a principle of the decomposed theory of planned behaviour applies to homework completion, an unexplored area of educational research. This result has important implication for teaching practices in secondary schools. Put differently, teachers could use the understanding of this theory on ICT adoption on homework to help vulnerable students believe in themselves. They could provide support by demystifying some of the misconception about ICT utilization in education and help students to take responsibility in starting and completing school activities.

Finally, the seventh hypothesis stating that technology facilitating condition and resource facilitating condition will predict students' extent of homework completion was confirmed. Factors such as poor Internet network, time and or money constraints, etc. were found to have a significant influence on students' extent of homework completion. Previous studies with related outcomes exist (e.g., Kanimozhi & Sundar, 2017; Nyasulu & Chanwiga, 2019). For example, Nyasulu and Chanwiga, (2019) used the decomposed theory of planned behaviour to investigate WhatsApp technology use among students in a Malawian University. They found that problems associated with WhatsApp technology adoption include costs of ICT gadgets, frequent electricity outages and unreliable Internet connection from mobile network service providers. These problems are common challenges associated with effective utilization of ICT among students in developing countries. Therefore, efforts must be synergized towards addressing these fundamental issues in schools in these areas.

Study Limitation

Like any other studies, the study is limited in a number of ways. The present study only focused on a few schools in only one education zone in the state, despite the several education zones available. As a result, the findings run into a problem of generalization to students from other education zones I the state or even outside the state. Future research could address this gap by extending focus to other education zones around the state. Similarly, the number of respondents included in the study is low and this also tends to limit the study's generalization. The study is also limited in the sense that it only employed a quantitative approach into the understanding of the phenomena under study. The powerful potential of a qualitative method to uncover in-depth findings on ICT use and homework completion was not explored. Future research efforts should capture the identified lapses in the study.

Conclusion

Based on the findings of the study, it was established that level of ICT literacy, students' attitude (e.g., perceived usefulness, the perceived ease of use and compatibility), subjective norms (pressures from peers and family members and teacher's supervision) and self-efficacy were important factors mediating the influence of students' ICT use and their extent of homework completion in the secondary schools that were studied. Technology and resource facilitating conditions were equally impactful on students' extent of homework completion in the secondary schools that were studied. It was also established that the identification of these predictors could point to the ICT educational need areas as well as suggest solutions to solving the identified problems.

References

- Aharony, N., & Zion, A. (2019). Effects of WhatsApp's use on working memory performance among youth. *J. Educ. Comput. Res*, *57*, 226–245.
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, *50*(3), 179–211.
- Alderete, M. V., & Formichella, M. M. (2018). The effect of ICTs on academic achievement: the Conectar Igualdad programme in Argentina. *Cepal Review*, *119*, 83-90.
- Azeta, A., & van der Merwe, M. (2018). Gender differences and technology usage amongst postgraduate students in a Christian University. Retrieved from <http://eprints.covenantuniversity.edu.ng/12483/1/Gender.pdf>
- Baron, R. M. & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.
- Buabeng-Andoha, C., & Issifu, Y. (2015). Implementation of ICT in learning: A study of students in Ghanaian secondary schools. *Procedia - Social and Behavioral Sciences*, *191*, 1282 – 1287.
- Chawinga, W. D., & Zinn, S. (2015). Lecturers' use of Web 2.0 in the Faculty of Information Science and Communications at Mzuzu University, Malawi. Mousaion. *South African Journal of Information Studies*, *33*(4), 62–85.
- Choi, Y., & Park, J. (2020). Investigating factors influencing the behavioral intention of online duty-free shop users. *Sustainability*, *12*, 7108. <https://doi.org/10.3390/su12177108>
- Colley, A., & Comber, C. (2003). Age and gender differences in computer use and attitudes among secondary school students: what has changed? *Educational Research*, *45*(2), 155–165. <https://doi.org/10.1080/0013188032000103235>
- Cooper, H., Lindsay, J. J., Nye, B., & Greathouse, S. (1998). Relationships among attitudes about homework, amount of homework assigned and completed, and student achievement. *Journal of Educational Psychology*, *90*, 70–83.
- Cooper, H., & Valentine, J. C. (2001). Using research to answer practical questions about homework. *Educational Psychologist*, *36*, 143–153.
- Dempsey, S., Lyons, S., & McCoy, S. (2019). Later is better: Mobile phone ownership and child academic development: Evidence from a longitudinal study. *Econ. Innov. New Technol*, *28*, 798–815.
- Frailon, J., Ainley, J., Schulz, W., Friedman, T. & Gebhardt, E. (2014). *Preparing for Life in a Digital Age* // . , *10.1007/978-3-319-14222-7*(), -. doi:10.1007/978-3-319-14222-7

- Gebhardt, E., Thomson, S., Ainley, J., & Hillman K. (2019). Introduction to gender differences in computer and information literacy. In *Gender differences in computer and information literacy, IEA Research for Education (A Series of In-depth Analyses Based on Data of the International Association for the Evaluation of Educational Achievement (IEA))*, Springer, Cham. https://doi.org/10.1007/978-3-030-26203-7_1
- Gnambs, T. (2021). The development of gender differences in information and communication technology (ICT) literacy in middle adolescence. *Computers in Human Behavior*, 114, 106533. doi:10.1016/j.chb.2020.106533
- Harris, S., Nixon, J., & Rudduck, J. (1993). School work, homework and gender. *Gender and Education*, 5, 3–14.
- Hastuti, S., Suryaningrum, D. H. L., & Susilowati, M. (2014). Implementation of decomposed theory of planned behavior on the adoption of e-filing systems taxation policy in Indonesia. *Expert Journal of Business and Management*, 2, 1-8.
- Hong, E., & Milgram, R. M. (1999). Preferred and actual homework style: A cross-cultural examination. *Educational Research*, 41, 251–265.
- Hashmi, Z. F., Dahar, M. A., & Sharif, A. (2019). Role of Information and Communication Technology in motivating university undergraduate students towards a learning task in public sector universities of Rawalpindi City. *Social Criminol*, 7, 196. <https://doi.org/10.35248/2375-4435.19.7.196>
- Hussein, I., Suleman, Q., & ud Din, M. N. (2017). Effects of Information and Communication Technology (ICT) on students' academic achievement and retention in chemistry at secondary level. *Journal of Education and Educational Development*, 4(1), 74-93.
- Iyanda, D. F., Okpele, J. K., & Akintunde, B. O. (2016). A study of ICT literacy skills and internet usage pattern of library users in Osun State College of Education, Ilaorangun, Nigeria. *FUTA Journal of Management and Technology, Maiden Edition*, 137-149.
- Iyorza, S. (2008) Media Imperative for Globalization of Nigerian Culture. *West African Association for Common Wealth Literature and Language Studies*, 2 (2)79-96.
- Iyorza, S & Ekwok, L. (2015) Audio-Visual Media Education and Oral English Teaching in Nigerian Secondary Schools, *Journal of Global Research in Education and Social Science*, 136-141.
- Iyorza, S (2014). Global media and cultural hybridization in the 21st Century in Nigeria. *Journal of Social Sciences (COES&RJ-JSS)* 3(3),408-416
- Iyorza, S. (2017). Nollywood in Diversity. *University of Nigeria Interdisciplinary Journal of communication Studies*, 21, 12-

- Iyorza, S. & Abu, P. (2020). Nigerian Television Drama Series and Audience Reactions: A Seismology Evaluation. *Journal Sosialisasi: Jurnal Hasil Pemikiran, Penelitian dan Pengembangan Keilmuan Sosiologi Pendidikan*, 1, 47-54.
- Kanimozhi, S., & Sundar, S. (2017). Adoption of 4G mobile services in India: an explanation through decomposed theory of planned behaviour. *Journal of Emerging Technologies and Innovative Research*, 4(11), 23-17.
- Mabayoje, M.A., Isah, A., Bajeh, A. O., & Oyekunle, R. A. (2015). An assessment of ICT literacy among secondary school students in a rural area of Kwara State, Nigeria: A community advocacy approach. *Covenant Journal of Informatics and Communication Technology*, 3(1), 40-53.
- Minikutty, A., & Sandhya, R. M. (2015). ICT literacy: A study among higher secondary school students. *Indian Journal of Research*, 4(4), 4-6.
- Mirghasemi, F. (2014). *Factors affecting post graduate students' attitude and behavioral intention toward online shopping* (Unpublished master's thesis). Universiti Teknologi Malaysia.
- Nyasulu, C., & Chawinga, D. W. (2019). Using the decomposed theory of planned behaviour to understand university students' adoption of WhatsApp in learning. *E-Learning and Digital Media*, 204275301983590. doi:10.1177/2042753019835906
- OECD. (2011). *PISA 2009 results: Students on line. Digital technologies and performance (Volume VI)*. Paris, France: OECD Publishing. <http://dx.doi.org/10.1787/9789264112995-en>.
- Ogwo, E., Maidoh, N. E., & Onwe, C. E. (2015). Computer studies and its impact in secondary schools in Umuahia-North Local Government Area of Abia State, Nigeria. *I.J. Modern Education and Computer Science*, 6, 16-23.
- Oliver, R. (2002). The role of ICT in higher education for the 21st century: ICT as a change agent for education. [file:///C:/Users/USER'S PC/Downloads/The role of ICT in higher education for the 21st c.pdf](file:///C:/Users/USER'S PC/Downloads/The%20role%20of%20ICT%20in%20higher%20education%20for%20the%2021st%20c.pdf)
- Patall, E. A., Cooper, H., & Robinson, J. C. (2008). Parent involvement in homework: A research synthesis. *Review of Educational Research*, 78, 1039–1101.
- Perie, M., Moran, R., & Lutkus, A. D. (2005). *NEAP 2004 trends in academic progress: Three decades of student performance in reading and mathematics (NCES 2005–464)*. Washington, DC: U.S. Department of Education.
- Santos, G., Ramos, E., Escola, J., & Reis, M. (2019). ICT literacy and school performance. *TOJET: The Turkish Online Journal of Educational Technology*, 18(2), 19-39.
- Schindler, L. A., Burkholder, G. J., Morad, O. A., & Marsh, C. (2017). Computer-based technology and student engagement: a critical review of the literature. *International*

Journal of Educational Technology in Higher Education, 14(1),
???. <https://doi.org/10.1186/s41239-017-0063-0>

- Shih, Y., & Fang, K. (2004). The use of a decomposed theory of planned behavior to study Internet banking in Taiwan. *Internet Research* 14(3): 213–223. <https://doi.org/10.1108/10662240410542643>
- Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, 6(2), 144–176.
- Trautwein, U., Ludtke, O., Schnyder, I., & Niggli, A. (2006). Predicting homework effort: Support for a domain-specific, multilevel homework model. *Journal of Educational Psychology*, 98, 438–456.
- Voyles, M. J. (2011). *Student academic success as related to student age and gender* (Unpublished doctoral dissertation). The University of Tennessee at Chattanooga Chattanooga, Tennessee.
- Xu, J. (2005). Purposes for doing homework reported by middle and high school students. *The Journal of Educational Research*, 99, 46–55.
- Xu, J. (2011). Homework completion at the secondary school level: A multilevel analysis. *The Journal of Educational Research*, 104(3), 171–182. <https://doi.org/10.1080/00220671003636752>
- Younger, M., & Warrington, M. (1996). Differential achievement of girls and boys at GCSE: Some observations from the perspective of one school. *British Journal of Sociology of Education*, 17, 299–313.