Factors that motivate teachers to use ICT in teaching: A Case of Kaliua District Secondary Schools in Tanzania

John Marco Pima
Kaliua District Council, Tanzania

ABSTRACT

The purpose of this paper is to investigate the factors that motivate teachers to use Information Communication Technologies (ICT) in teaching in remotely located secondary schools in Tanzania. The research used 14 secondary schools from Kaliua District as a case study, with a sample of 111 teachers. The research used simple random sampling strategy and a standardised questionnaire as the main tool of data collection. The results show four motivating, namely, teacher's experience with the use of ICT; presence of technologies such as Internet and smartphones; expected benefits of using ICTs; and finally the need to attain satisfactions and teaching objectives. The findings suggest that teachers in remotely located schools are ready to use ICT in teaching if the afore mentioned factors are present. Therefore, this paper advances knowledge in the area of ICT for teaching in secondary schools in remotely located schools. The paper provides new insights useful for researchers in this area, and for decision makers in the Local Government Authority Management. The paper reveals that teachers are motivated and ready to use ICT in teaching.

Keywords: *ICT in Secondary Schools; Kaliua District Council; TAM; Tanzania*

INTRODUCTION

The advancement in Information and Communication Technologies (ICT) has changed the way people share information in all sectors (Pima *et al.*, 2016; Popova and Fabre 2017). In education, ICT is commonly used and has been known by different names. Some of the common names used include e-learning (Kisanjara *et al.,* 2017), online learning (Mtebe and Raphael, 2017), blended learning (Pima *et al.,* 2016) and flipped learning (Köroğlu and Çakır, 2017). However, in all cases, the use of ICT in education is common in higher education than in secondary and primary schools in Tanzania (Kisanjara *et al.,* 2017; Mtebe and Raphael, 2017; Tarimo and Kavishe, 2017; Pima and Mtui, 2017). These extant literatures show more research into ICT in higher education than in secondary education (Graham, Woodfield and Harrison, 2013; and Pima *et al.,* 2018). In secondary education, there are ongoing efforts that could enable the use of ICT in teaching (Gyamfi 2017). For instance, ICT is a subject in all Teachers Training College institutions in Tanzania. Additionally, ICT is taught and examined as a practical subject. On the other hand, college students are required to submit their assessment in softcopy and present using PowerPoint (Francis, Ngugi and Kinzi, 2017). Furthermore, college students learn to use the Internet to access online databases. Therefore, teachers in secondary schools are prepared with some soft skills to use ICT in teaching.

From the foregoing, it can be noted that the use of ICT in education requires a presence of resources. Some of the common resources needed include hardware, software, data and people (Pima *et al.,* 2016). Ngoungouo (2017) notes some of the ICT devices for educational use such as laptops, desktop computers, calculators, telephones, data storage devices, printers, cameras, overhead projectors, interactive white board, web-technologies, and other peripheral devices. All these devices are vital for the use of ICT in teaching in secondary schools.

To date, teachers in secondary schools in Tanzania, use hand-written notes, teach what is mainly found in the textbooks, and use a face-to-face pedagogical approach in their classrooms. As a result, the benefits and opportunities of ICT remain untapped. According to Francis, Ngugi, and Kinzi (2017), some of the benefits of using ICT in secondary schools include better records storage, improved school management, enhancing learning and teaching, managing time tabling and improved examinations and accountability. Other benefits of ICT in secondary schools include improved interactions between teachers and students, reduction in manual tasks and enhancing both individual and institutional productivity (Teeroovengadum, Heeraman, and Jugurnath, 2017).

From the foregoing, a teacher is the main actor towards effective ICTs adoption and use in the teaching and learning process. This paper focuses on the motivating factors, for teacher use of ICT, in remotely located secondary schools in Tanzania. The new knowledge on the factors of adoption of ICT in secondary schools in Tanzania could be useful in the development of contextual ICT adoption strategies. Therefore, the paper answers the following research question: *What are the factors that motivate teachers to use ICT in teaching in remote secondary schools in Tanzania?* The paper divulges potential opportunities for improving secondary education using ICT in the teaching process. It further advances knowledge in the area of ICT application in Tanzanian remotely located Secondary Schools and its impacts on human capital development in the 21st century.

LITERATURE REVIEW

Overview

ICT use in secondary school education has gained acceptance and recognition as the main enabler and driving force towards human knowledge development (Eligi and Mwantimwa, 2017). ICTs act as a catalyst, media, and facilitator of the pedagogical and instructional settings. In terms of inclusive learning, ICTs acts as an equalizer, by providing equal opportunities to learning and teaching by all people, the disabled, and abled (Pima, 2012; and Eligi and Mwantimwa, 2017). The extant literature reveals small effects on the motivating factors for the use of ICT for teaching in remotely located secondary schools in Tanzania. However, given the tremendous advancement in ICTs, the literature suggests that use of ICT in secondary school teaching should be placed as a top priority for all developing nations.

ICT in Secondary School Education

ICT comprises of all technologies, which are used for information creation, processing, storage and output. This means, all devices and technologies for the input, processing and output of information. Additionally, ICT includes all technologies used in the communication process. That is, the technologies that enables both synchronous and asynchronous communication. In this context, ICT use in the Secondary School Education System is expected to facilitate information processing and communication of the curriculum. In other words, ICT is vital for both administrative functions as well as the pedagogical functions of the school.

The administrative functions of the school could be facilitated by ICT using desktop computers, laptops, calculators, telephones, printers, scanners, the Internet, and video cameras. In addition, pedagogical functions of the school could be facilitated by ICT using similar devices for the administrative functions. More specifically, the pedagogical functions could be aided by ICT with overhead projectors, data storage devices, interactive white boards, Learning Management Systems (Moodle), and the Internet (Ngoungouo, 2017). Each of the above-mentioned has an important role in the achievement of the school's teaching and learning objectives.

The extant literature has further emphasized that the use of ICT in teaching requires appropriate planning and integration of ICT into the school programme, teacher readiness, and good ICT infrastructure(Junqueira, 2015; Pima *et al.,* 2016; Mtebe and Raphael, 2017; Asabere*et al,* 2017); Ngoungouo, 2017; Tondeur*et al.,* 2017). This paper concentrates on the teachers' readiness by answering the research question: *What are the factors that motivate teachers to use ICT in teaching in remote secondary schools in Tanzania?* The teachers as the main actors in the use of ICT in teaching and learning, could enjoy the benefits and thus enhance teaching and learning in secondary schools.

Benefits of Using ICT in Secondary Schools

The administrative and pedagogical functions of a secondary school could be implemented through ICTs. A summary of the benefits of using ICTs in Secondary Schools is provided in Table 1. The first column provides a list of benefits. Each of the benefit corresponds to at least one function of the school in column two and three. The second column provides the school administrative Functions abbreviated as A.F, and the third column shows the pedagogical functions abbreviated as P.F. A summary of benefits in Table 1, has been extracted from the reviewed literature (Francis, Ngugi and Kinzi, 2017; Eligi and Mwantimwa, 2017; Kisanjara *et al.,* 2017; Köroğlu and Çakır, 2017); Ngoungouo, 2017; Palts and Kalmus, 2015; Popova and Fabre, 2017; Tarimo and Kavishe, 2017; and Tondeur *et al.,* 2017).

Table 1: *A Summary of Benefits of Using ICTs in Secondary Schools*

Benefits	A.F	P.F
Facilitated teaching material preparations	✓	✓
Facilitated teaching material searching and analysis		✓
Facilitated students registration and enrolment	✓	
Increased interactions between students and teachers in classroom		✓
Increased equal access to teaching materials by all students and teachers	✓	✓
Improved both students and teachers academic performance		✓
Aided in the preparations and marking of examinations		✓
Improved the integrity and security of examination papers and other vital records	✓	
Aided in the preparation and management of the school timetable and school programmes.	✓	
Provided secure and reliable storage space	✓	
Improved school's secretarial activities	✓	
Improved teaching through Audio-Visual methods		✓
Increased students' engagement and independence in class activities home works.		✓
Enhanced communication mechanisms and postage	✓	
Improved teachers and students accountability	✓	
Increased communications between the school and parents	✓	
Increased communications between the school and higher authorities	✓	
Enhanced learning and teaching	✓	✓
Raised school reputation and ranking	✓	✓

According to Davis (1989), in the Technology Acceptance Model (TAM) two dimensions could determine the motivation behind technological acceptance. The dimensions include perceived usefulness and ease of use. Naturally, an individual accepts new technology mainly when such change is anticipated to be useful and easy to use. Figure 1 illustrates the direct positive impact of Perceived Usefulness and the Ease of Use of ICT in Secondary school, on the teachers' attitude towards the actual use.
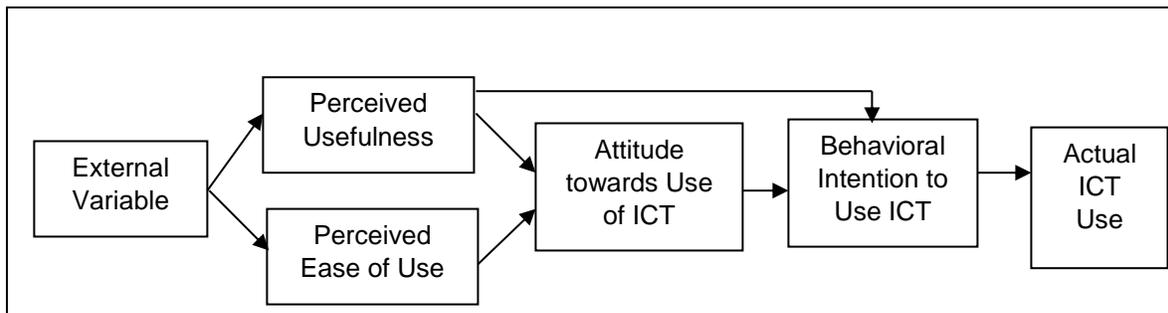
Figure 1: TAM Model for ICT use in Secondary School

When the attitude towards use of ICT has been created, the teacher builds a behavioural intention to use and finally, the actual use. As stated above, intrinsic factors are natural and personally determined. This is contrary to extrinsic, which considers time and ease of access, which may be overcome if intrinsic factors are positively related to acceptance. Moreover, in order to create a suitable environment for acceptance, teachers ought to be asked about what they believe they will be able to do that will be more productive if they use ICT. In a similar way, a better approach is required to make teachers use ICTs in teaching in secondary schools. In the context of remotely located secondary schools, a phased-approach could be the best strategy. The school management could divide the project into phases, and thereby implement each of them based on the availability of funds (Graham, Woodfield and Harrison, 2013).

METHODS

Research Design

In order to answer the research question, a case study research design was adopted, and provided an opportunity for a thorough and in-depth investigation (Creswell and Plano Clark, 2011; and Saunders, Lewis and Thornhill, 2009), into the factors that motivate teachers to use ICT in remotely located secondary schools in the Kaliua District. Additionally, the research used quantitative techniques from data collection to analysis and reporting stages.

Participants and Sampling

Participants were teachers from 14 Secondary Schools in the Kaliua District Council. In this study, simple random sampling was used to identify 111 teachers. Simple random sampling was used to provide equal opportunity for all teachers in the district. On the other hand, purposive sampling strategy was used to obtain participants from 14 Heads of School, 3 District Education Officers, and 2 Heads of department responsible for planning and finance management. Purposive sampling strategy was important to get specific participants who, according to their position and job responsibilities, had first-hand information to answer the research question.

Instruments of the Study and Data Gathering Procedures

The research used questionnaires to collect primary data from 111 teachers selected as a representative sample of the population. The questionnaire utilized a five-point Likert scale ranging from, one=Strongly Disagree to five=Strongly Agree, to test for the factors illustrated in Figure 1.

Results and Discussion

The data collected were all-primary and answered the research question on the motivating factors for the use of ICT in teaching in secondary schools. The collected data was analysed and tabulated for a wider readability and understanding. The results are summarised into three themes: Perceived Usefulness, Perceived Ease of Use, and Attitude towards use of ICT in teaching in secondary schools.

Perceived Ease of Use

The perceived ease of use was a factor used to predict the degree to which a teacher believes that using ICT in teaching could be easy, requiring very little effort. A set of five statements was designed using a five-point likert scale.

The first statement required teachers to indicate their view on the following: *I understand that my past experiences on ICT could help me to use ICT in teaching.* The results show that 44 teachers Strongly Agreed while 58 Agreed This means, 102 of 111 (92%) respondents agreed that their past experience in using ICTs is a motivating factor towards the use of ICT to teach in Secondary Schools. On the other hand, 9 (8%) respondents did not agree that their past ICT experiences was not a motivating factor towards the use of ICT in teaching in Secondary Schools.

The second statement required teachers to indicate their view on the following: *I believe that my past experiences in ICT motivates me to use ICT in teaching.* The results show that 55 of 111 respondents strongly agreed, and 44 of 111 respondents agreed; that is, 89% of all respondents. On the other hand, 10 respondents were neutral, and 2 disagreed, making a total of 12 respondents (11%).

On the third statement, respondents were asked to indicate their veiw on: *I confirm that I have used at least one of the following: Smart Phone, Feature Phone, laptop, or desktop in the past.* The five-point likert scale responses show that 71 respondents strongly agreed, and 34 agreed. This makes a total of 105 of 111 (95%) respondents. On the other hand, 4 of the respondents were neutral, and 2 disagreed, equivalent to 5% of all respondents.

Likewise, the responses on the fourth statement: *I believe that the available ICT resources at my school could help in teaching*, resulted in 42 respondents strongly agreeing and 31 respondents agreeing, accounting for 73 (66%) of all respondents. On the other hand, 10 respondents were neutral, 21 disagreed, and 7 strongly disagreed, equivalent to 38 (34%) of all respondents.

The last statement in this category required respondents to indicate *I believe that I have the ability to buy at least one of the following: Smart Phone, Laptop, or desktop computer.* The response show that 55 respondents strongly agreed and 46 respondents agreed, making a total of 101 (91%). On the other hand, 7 respondents were neutral, 1 respondent disagreed, and 2 respondents strongly disagreed.

The results suggest that the past experiences of teachers in ICT is an important factor that may affect the decision to use ICT in teaching in secondary schools. The experience could aid in the actual use without difficulties. Additionally, experience could be a motivating factor since the teacher is confident and believes that the use of ICT would not be difficult. The experience aspect is vital towards the decision to use ICT especially for teachers who are teaching in remotely located secondary schools in Tanzania

Ownership of any device that is Internet enabled is an important factor that could motivate a teacher to use ICT in teaching. The device could be mobile or standalone. The results suggest that the availability of ICT resources such as computers, printers, scanners, the Internet, and mobile devices is an important factor that could affect the decision of teachers towards the acceptance and use of ICT in teaching in secondary schools. Furthermore, the results, indicate that with the available ICT resources for teaching, it can be perceived as easy to use since the devices are known and probably are already in use.

Moreover, the results above indicates that 91% of all respondents strongly agree that they have the ability to buy at least one device that is capable of connecting to the Internet and this can be interpreted as having the potential for use in teaching in secondary schools in Tanzania. In other words, teachers in secondary school view ICT devices for teaching, as an important tool that could aid their teaching and increase personal productivity and students' performance.

Perceived Usefulness

The perceived usefulness was the second factor in the model to be examined in this paper using three statements. Perceived Usefulness was used to predict the degree to which a teacher believes that using ICT in teaching could help in producing better teaching outcomes. The number of respondents was 111 from teachers group.

The first statement required respondents to indicate their views on: *I understand that the new technologies available could be used to improve teaching in secondary schools.* The results show that 64 respondents strongly agreed and 38 agreed, equal to 102 (92%) of respondents. Additionally, 7 respondents were neutral and 2 strongly disagreed, equivalent to 8% of all respondents.

The second statement was: *I believe that my teaching performce could be improved through the use of ICT in classroom.* The results show that 68 respondents strongly agreed and 35 agreed, making a total of 103 (93%) of all respondents. On the other hand, 4 respondents were neutral, 1 respondent disagreed and 3 respondents strongly disagreed.

The third statement was: *I understand that there are varieties of internet connection options in my area that could make me acess the internet.* The results show that 24 of 109 respondents strongly agreed and 34 respondents agreed, for a total of 58 (53%) of 109 respondents.
On the other hand, 14 (13%) of respondents were neutral, 18 disagreed and 19 strongly disagreed; for a total of 37 (34%) of all respondents.

In assessing the perceived usefulness, the results indicate that 92% of the participating teachers perceive that the new technologies are useful to improve teaching in secondary schools in Tanzania. This can be interpreted to mean that teachers are ready to use ICT in teaching because it can improve their performance and productivity in secondary schools. Likewise, about 93% of teachers perceived that their performance could be improved through the use of ICT. These results suggest that the use of ICT could strongly improve the teaching process, including class notes preparations, actual teaching and coaching, class activities and assessments, examination setting, printing and marking; communicating results to students, results analysis and reporting, and finally review of individual work and the curriculum. All these processes could be facilitated by the use of ICT. Therefore, the presence of ICT resources is an important factor for the use of ICT in teaching.

The results also indicate that 52% of participating teachers agree that there are several Internet connection options that enable them to access the Internet. The knowledge of available Internet connection options provides an individual with a positive mindset that will be useful for teaching with ICT. However, 35% of teachers surveyed disagreed that the available Internet connection

options iin their areas could make them use ICT in teaching. That is, Internet connection is a problem in many areas in remotely located secondary schools and could impact the decision to use ICT in teaching.

Attitude towards use of ICT

In this theme, the perceived usefulness and perceived ease of use was found to influence the attitude of secondary school teachers towards the use of ICT in teaching. The attitude towards the use of ICT was measured using three statements on a five-point Likert scale.

The first statement required respondents to indicate their views on: *I will feel more satisfied to use ICT in teaching than traditional classroom teaching.* The results show that 58 respondents (n=110) strongly agreed and 41 agreed, for a total of 99 (90%) respondents. On the other hand, 6 of respondents were neutral, 3 disagreed, and 2 strongly disagreed for a total of 11 (10%) respondents.

The second statement was: *I believe that I can make my lesson more interesting when I incorporate ICT in teaching.* The results show that 65 of 110 respondents strongly agreed and 39 respondents agreed for a total of 104 (95%) respondents (n=110). On the other hand, 4 of respondents were neutral and 2 disagreed.

The third statement was: *I believe that teaching with ICT could increase students motivation to learn.* The results show that 81 of 109 respondents strongly agreed and 28 respondents agreed. This makes a total of 109 (100%) respondents who agreed.

The results indicate that 90% of teachers agree that they would feel more satisfied to use ICT in teaching than traditional classroom teaching. This means that teachers' attitude is positive towards the use of ICT in teaching in secondary schools in Tanzania. Further, over 95% of teachers agreed that they can make their lesson more interesting when they incorporate ICT in teaching. This is a fundamental point that suggests that teachers are ready to use ICT in teaching. Markedly, teachers responses indicated interest in using ICT over a traditional face-to-face pedagogical approach. 100% of the teachers agreed that teaching with ICT could increase students' motivation to learn. The combination of face-to-face and technology-enabled models could offset the disadvantages of each other.

Behavioural Intention to Use

The behavioural intention to use ICT is an outcome of the attutude of teachers as it is influenced by perceived usefulness and ease of use of the expected ICT. This factor was measured using three statements on the five-point Likert scale.

The first statement required respondents to indicate their views on: *I believe that the use of ICT in teaching could improve presentation of materials in classroom.* The results show that 65 of 110 respondents strongly agreed and 42 respondents agreed. On the other hand, 1 respondent was neutral and 2 respondents disagreed. From this data, 107 (97%) respondents agreed and only 3 3% respondents disagreed.

The second statement was: *I believe that ICT could make teaching and learning more enjoyable.* The results show that 70 of 111 respondents strongly agreed and 38 respondents agreed. This is equivalent to 97% of all respondents. On the other hand, 3 (3%) respondents were neutral.

The third statement required respondents to indicate their views on: *I believe that using ICT in teaching could make the lessons more interesting for the teacher.* The results show that 68 of 111

respondents strongly agreed, 35 agreed for a total of 103 (93%) of all respondents. On the other hand, 6 respondents were neutral and 2 disagreed, for a total of 8 (7%) respondents.

In the category of Behavioural Intention to Use ICT, the results show that 97% of teachers agreed that the use of ICT in teaching could improve presentation of materials in classroom. Additionally, ICT could be used in the teaching process from material search and material preparations to classroom interactions and feedback. In addition 97% of teachers agreed that ICT could make teaching and learning more enjoyable. This means that the efforts and behaviour of teachers could be impacted by the use of ICT and could make teaching more enjoyable. Finally, the results show that 93% of teachers believe that using ICT in teaching could make the lessons more interesting. Feeling interested in teaching means developing behaviour that would positively impact the decision to use ICT in teaching in secondary schools.

Overall. the results suggest that teachers in secondary schools are ready to use ICT in the teaching and learning process. The results show four major factors that motivated teachers. These include teacher's past experiences on the use of ICT; presence of technologies such as the Internet and smart phones; expected benefits of using ICTs; and finally the need to attain satisfaction and teaching objectives. From the foregoing, the results show that there is a direct positive relationship between the four dimensions of the model and the level of acceptance to use ICT in teaching in secondary schools in Tanzania.

Further, the results show that teachers are ready to use ICT in teaching in secondary schools. The four motivating factors discussed above suggest that teaching using ICT in secondary schools is possible. For instance, the results show that the majority of teachers in secondary schools have past experiences that enable them to use ICT in teaching. The sources of past experience could be through formal school and college curricula or from personal initiative to use ICT. Teachers would require "user training" to use ICT in teaching. In other words, teachers have the ability and experience to use ICT in teaching. The second motivating factor discussed above is the presence of technologies such as the Internet and smartphones. The new technologies have enabled teachers, just like other professional groups, to use smartphones for social and formal purposes. Some of the common uses include chatting through social media, online transactions, and access to online government services. The use of new technologies creates abundant experiences that form a baseline for future use of ICT in teaching.

The third finding discussed above is the teacher's expected benefits of using ICTs. If we refer to the summary of benefits shown in Table 1, we note that teachers could be highly motivated to use ICT in teaching if they anticipate benefits such as those mentioned in the table. Further, the fourth motivating factor is the need to attain satisfaction and teaching objectives. Both personal and job satisfaction could motivate teachers to use ICT in secondary schools for teaching purposes. Overall, the discussion above makes a contribution to research on use of ICT for teaching in secondary schools in remote areas. Finally, the above discussions form a central argument that there are factors that motivate teachers to use ICT in teaching in secondary schools.

CONCLUSIONS

Conclusively, the factors that motivate teachers to use ICT in teaching in remotely located secondary schools in Tanzania were investigated using a survey of 14 secondary schools in Kaliua District. The major findings indicate the readiness and need for ICT in secondary schools. The current literature shows the benefits that teachers and students could derive when ICTs are used in the teaching process. The paper provides new insights useful for researchers in this area, and for decision makers in the Local Government Authority Management. It reveals that teachers are motivated and ready to use ICT in teaching. The future research could be on the adoption strategy. That is, this paper submits that the adoption of and use of ICT in secondary schools require a

phased approach. The approach would include dividing the ICT adoption project into phases, and then implementing each phase based on the funds available. The results show that there is a direct positive relationship between the four dimensions of the model and the level of acceptance to use ICT in teaching in secondary schools in Tanzania. This being a case study, the findings can be generalized to similar contexts in Tanzania and elsewhere.

REFERENCES

Asabere, N., Togo, G., Acakpovi, A., Torgby, W., & Ampadu, K. (2017). AIDS:
An ICT model for integrating teaching, learning and research in Technical University Education in Ghana. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 3, pp.162-183.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and Conductiong Mixed Methods Research* (2nd ed.). London: SAGE Publications, Inc.

Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly,* vol. 13, no. 3, p. 319.

Eligi, I., & Mwantimwa, K. (2017). ICT accessibility and usability to support learning of visually-impaired students in Tanzania. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 2, pp. 87-102.

Francis, N. N., Ngugi, M., & Kinzi, J. (2017). Influence of selected factors on the implementation of information and communication technology policy in public secondary schools in Naivasha Sub-county, Kenya. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 2, pp. 70-86.

Graham, C. R., Woodfield, W., & Harrison, B. J. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *The Internet and Higher Education, 18*, vol. 18, pp. 4-14.

Gyamfi, S. A. (2017). Informal tools in formal context: Adoption of web 2.0 technologies among geography student teachers in Ghana. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 3, pp.24-40.

Junqueira, E. (2015). The Cyberculture Theories and Teacher Preparation at the LIFE-UFC Project in Brazil. *International Journal of Education and Development using Information and Communication Technology,* vol. 11, no. 3, pp. 109-116.

Kisanjara, S. B., Tossy, T. M., Sife, A. S., & Msanjila, S. S. (2017). An integrated model for measuring the impacts of e-learning on students' achievement in developing countries. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 3, pp.109-127.

Köroğlu, Z. Ç., & Çakır, A. (2017). Implementation of flipped instruction in language classrooms: An alternative way to develop speaking skills of pre-service English language teachers. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 2, pp. 42-55.

Mtebe, J. S., & Raphael, C. (2017). A decade of technology enhanced learning at the University of Dar es Salaam, Tanzania: Challenges, achievements, and opportunities. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 2, pp.103-115.

Ngoungouo, A. (2017). The use of ICTs in the Cameroonian school system: A case study of some primary and secondary schools in Yaoundé. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 1, pp. 153-159.

Palts, K., & Kalmus, V. (2015). Digital channels in teacher-parent communication: The case of Estonia. *International Journal of Education and Development using Information and Communication Technology,* vol. 11, no. 3, pp. 65-81.

Pima, J. M. (2012). Conformance to Web Accessibility Guidelines by E-Learning Systems used in Open and Distance Learning Institutions. *The Accountancy and Business Review.*

Pima, J. M., & Mtui, J. (2017). Investigating the lecturers' challenges to embrace Collaborative Web Technologies in Higher Education Institutions. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 3, pp. 80-97.

Pima, J. M., Odetayo, M., Iqbal, R., & Sedoyeka, E. (2016). Assessing the available ICT infrastructure for collaborative web technologies in a blended learning environment in Tanzania: A mixed methods research. *International Journal of Education and Development using Information and Communication Technology,* vol. 12, no. 1, pp. 37-52.

Popova, I., & Fabre, G. (2017). Digital inclusion of secondary schools' subject teachers in Bolivia. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 3, pp. 41-56.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Edinburgh: Pearson Education Limited.

Tarimo, R., & Kavishe, G. (2017). Internet access and usage by secondary school students in Morogoro Municipality, Tanzania. *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 2, pp. 56-69.

Teeroovengadum, V., Heeraman, N., & Jugurnath, J. B. (2017). xamining the antecedents of ICT adoption in education using an Extended Technology Acceptance Model (TAM). *International Journal of Education and Development using Information and Communication Technology,* vol. 13, no. 3, pp. 4-23.

Tondeur, J., Aesaert, K., Pynoo, B., Braak, J., Fraeyman, N., & Erstad, O. (2017). Developing a validated instrument to measure preservice teachers' ICT competencies: Meeting the demands of the 21st century. *British Journal of Educational Technology,* vol. 48, no. 2, pp. 462-464.

_____