Research Article

Stakeholders' Perceptions on Adoption of Blended Learning Approach in Tanzania Secondary Schools

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Integrating information communication technologies in education goes with many digital learning applications. Blended learning Approach (BLA) has been an important strategy that facilitates students' learning. This study investigated stakeholders' perceptions of the adoption of a blended learning approach (BLA) in Tanzania secondary schools. Specifically, the study identifies stakeholders' conception of the adoption of BLA in secondary schools; examines the learning environments that support the adoption of BLA in Tanzania secondary schools, and assesses the extent to which the BLA is used in selected secondary schools as well. The study adopted a case study design with a sample of 76 respondents. Interview, participant observation, questionnaire and documentary review methods were used to collect data. The results showed positive attitudes towards the contributions of BLA to students' learning. It was further noted in this study that BLA motivated students' learning with audio-visual materials. Likewise, the learning environments in the studied schools were supportive of the adoption of BLA. The environment facilitated the networking of teachers, improved the teaching approaches, and students were able to follow and enjoy lessons. The application level of BLA was high. However, poor infrastructure, lack of institutional support and insufficient hardware and software facilities impinged the use of BLA. In conclusion, BLA is well perceived; thus, the resolution to the challenges would promote its application in the classroom.

Introduction

Learning technologies are the whole shebang in modernised education systems, which are claimed to provide students with the most labour needed in 21st-century job skills. Schools and companies struggle to adopt user-friendly, supportive, communicative, individual-owned, accessible and flexible learning approaches (Siew-Eng & Muuk, 2015). As such, in both the teaching and working worlds, the blended learning approach (BLA) is a promising strategy, and it seems that society is expecting it as it looks at digital learning and working capacities. Typically, BLA encompasses collaborative platforms, webinars, interactive audiovisual and online learning coupled with face-to-face interaction to support student learning (Zhu, 2017; Ustun, 2019). According to van Laer and Elen

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(2018), blended learning occurs in an instructional context and is distinguished by the intentional use of online and classroom-based interventions to initiate and support learning. However, it is also the case that one definition is yet to be achieved (Graham, 2013; blended learning in learning institutions and explicitly in developing countries is arguably influenced by the increased comprehensive adoption of Information Communication Technologies (ICTs) and learning technologies (Machumu, Almasi & Zhu, 2017; Van Laer, 2020).

As it stands, blended learning refers to the use of computer-assisted learning combined with contact moments whereby interaction between students, teachers, internet-based devices, and learning management systems influence active teaching and learning (Machumu et al., 2017). Blended learning focuses on improving the quality of learning time without restrictions as well as enabling active learning and interaction between learners and teachers; learners and learners; and learners and tools. Scholars are always intrinsically to find out the best means to reposition schools as premium sources of knowledge and capacity building for students based on current trends of employability which is a daunting issue (Lynch et al., 2018). The application of the teaching and learning models that integrate teachers and students in an interconnected way while each finds its part to play was sought to be best by blending the traditional and modern delivery modes within the realm of information technologies (Zhoa, 2012; Uzunboylu & Karagozlu, 2015).

It is argued that blended learning exposes students and teachers to the outer and higher horizons, which are far beyond the traditional hook of the book-teacher model where learning should be necessarily limited to the classroom (Siew-Eng & Muuk, 2015). This entails that BL is much more flexible in representing content through the use of different styles that can enhance learning. Due to its effectiveness, different countries have adopted BLAs in their curricula. Countries like the USA, Chile and Malaysia have adopted the model and integrated it into the education curriculum for lower schools.In Malaysia, for instance, teachers are provided with many new technologies that are believed to be able to help them perform their jobs better. Over the past two decades, the government has invested millions of dollars in equipping all 10,000 public schools with not only computer labs but also the Frog Virtual Learning Environment (VLE) (Bushko, 2017; Cheok et al., 2017). Malaysia puts attention on e-learning in schools as a segment of the government's vision for 2020 (Siew-Eng & Muuk, 2015; Thah, 2014). The analysis of Malaysian teachers was able to integrate e-learning into their teaching practices (Cheok et al., 2017).

In Tanzania, SEDP (2004-2009) emphasised ICT-based information management in primary, secondary and teacher training colleges (URT, 2010). The development of the Information Communication Technology (ICT) policy for basic education facilitated the integration of curriculum and content in the modern pedagogy of teaching and learning. The general role of these policy frameworks acknowledged the use of ICT devices in education in order to improve the quality of education and helped to raise awareness of the benefits and the potential gains in adopting ICT in the education sector, which, in turn, raised ICT to priority area in education planning (Hooker, Mwiyeria & Verma, 2011). Despite the impressive policy statement, its implementation is far behind the reach of the policy target. It was expected that the application of blended learning would have spread all over the country but that is not the case.

Empirical evidence shows that the level of teachers applying ICTs in school was too minimal to facilitate the integration of traditional methods and ICTs in classroom teaching (Ndibalema, 2014). As such, the deployment of ICT knowledge in secondary schools in Tanzania was not fully realised (Kalegele et al., 2016). There are no specific and sufficient reasons that are brought forth to explain about observed findings. If the BLA is the current ideal delivery mode of teaching and learning that secondary schools should adopt, then, the need to uncover the unknown reasons for poor utilisation of blended learning in secondary schools is highly demanded. Consequently, this study investigates stakeholders' perceptions of the adoption of BLA in secondary schools. Integration of BLA in the education system is an effective approach to dispensing knowledge and learning innovation to students and teachers (Keane, Keane, & Blicblau, 2016).

However, cognisant of the importance of adopting ICT in the education system, the government of the United Republic of Tanzania deliberately integrated the content of the curriculum in primary and secondary schools with that of ICTs.The need was to ensure that students are taught about the application of ICT facilities and make ICT an instrumental component of the teaching and learning process in a blended form (URT, 2007; Ndibalema, 2014). Further, the policy decisions that the government undertook did not seem to actualize, since many secondary school teachers are still attached to the use of traditional methods of teaching (Machumu & Zhu, 2019). Blended learning is still regarded as a new approach by most teachers and students in schools, meaning that the policy statement is in contradiction to the observed practices. It is high time for the study to find out the reasons causing the observed mismatch between the policy and practices. The interest of the study was to probe the stakeholders' perceptions on the adoption of a blended learning approach in Tanzanian secondary schools. To achieve this objective, this study was guided by the following research questions:

i. What are stakeholders' perceptions about the adoption of a blended learning approach in secondary schools in Morogoro Municipality?
ii. How do school learning environments support the adoption of a blended learning approach in secondary schools in Morogoro Municipality?
iii. To what extent is the blended learning approach used in secondary schools in Morogoro Municipality?

Blended Learning and Blended Learning Environments

Garrison and Kanuka (2004) view BL as an integration of old face-to-face classroom experience and online learning experience. According to Rydeen (2011), BL takes several contexts of learning approaches that provide a learner and a teacher with the potential possibility to learn and teach effectively. In this study, BL refers to a combination of conventional face-to-face methods and ICT to form an integrated instructional approach. This combination inspires students to engage themselves in active and collaborative learning. BL focuses on the incorporation of traditional forms of teaching with active and highly customised individualised designs of learning using communications and information technology (Lo et al., 2011). BL enhances learning because it combines the benefits of modern ICT with traditional lectures. BL offers more flexibility because the student decides how much

time to devote to an independent study (Tarus et al., 2015). In BLA, online learning and teaching encourage the sharing of experiences among students (Singh & Shivam, 2015) thus improving learning. Also, the application of BL is designed to attain the goal of child-centred education (Chaundry & Malik, 2014); students experience using new technology (Dangwal & Lalima, 2017); blended learning helps students to practice life skills (Singh & Shivam, 2015).

Further, blended learning environments have been referred to as the combination of the effectiveness of face-to-face teaching environments and ICT-mediated teaching and learning environments (Graham & Allen, 2009; Machumu, 2018).Graham (2013) suggested the following essential features of BL environments: increased student engagement in learning, students feeling safe with personalised learning, collaboration tools like social media communication, enhanced teacher and student interaction, social learning support, responsibility for learning and time management. In addition, other crucial features include improved student learning outcomes, time flexibility, enhanced institutional reputation and 24/7 access to training resources, tracking employee performance and skill development, reduction in training costs and provision of personalized training experiences. Blended learning is fundamental to student understanding (Gomez & Duart, 2012). The activities of BL are not tied to the classroom but involve activities that are self-directed learning contexts. When a BL is a constructivist learning environment, the interaction of students-students and student-teachers should improve the personal and concerted construction of knowledge in a continuous process at both the theoretical and methodological levels (Gomez, 2009).

Conditions for the Adoption of BLA in the Context of Secondary Schools and Beyond

The adoption of BL in secondary schools is a challenging activity since it demands some basic preparations in the aspect of the teaching and learning process, students, content design and the infrastructures (Dangwal & Lalima, 2017). The following are necessary conditions in the adoption of BLA: Blended learning demands well-trained teachers who could emphasise the student-centred approach of teaching and learning perspective (Chaundry & Malik, 2014). The teachers need to be familiar with the BLA and have the skills to blend both traditional face-to-face and online teaching and learning delivery. Further, teachers need to be trained to develop content in digital form so that it can be available to students. Teachers should know how to use learning technologies including websites, blogs, YouTube facilities, and software like Skype, Google Talk and social networking sites for educational purposes (Machumu, 2019).

Teachers engaging in BLA should have a scientific attitude to adopt diverse learning technologies relevant to BL implementation in secondary schools (Kenney & Newcombe, 2011; Farrely & Shand, 2017). Thus, to adopt a BLA, there is a need for flexibility in other aspects of learning such as learning timetable, delivery methods, assessments and examination system. These aspects are crucial for the adoption of BLA not only in secondary education but also in higher education (Warioba et al., 2022). The school should have both infrastructures, good classrooms but also have well-furnished computer laboratories with a sufficient number of computers to satisfy all the students of one class and the internet facility. Dangwal and Lalima (2017) declare that continuous internal assessment and other

tools for formative evaluation should be able to provide the need required for the adoption of the BLA in terms of facilities and infrastructures. Parents and guardians based on their roles as essential education stakeholders; need to be aware of a BLA. They need to support their children so that they can be ready to adopt BLA for the benefit of their children's academic progress (Kenney & Newcombe, 2011).

Uses of BL in Teaching and Learning in Secondary Schools

Teachers in secondary schools use BL to maximise the benefits of traditional face-to-face learning and online learning (Wang, Yang, & Wen, 2009). Studies show that secondary school teachers use BL to create the best learning environment for their students and that they blend different methodologies, and approaches to develop the most efficient learning environment (Wang et al., 2009). Secondly, BL has been used to support a student-centred learning environment that motivates active and deep learning in students (Vernadikis et al., 2011; Machumu, 2019). When student-centred learning is practised in a blended learning environment, instructions have to be provided through the online learning environment (Chaundry & Malik, 2014). The role of the teacher in a BLA changed to a facilitator as opposed to a sage on stage (King, 1993).

Thus, instructions to be provided through online, learning activities and other resources should be carefully selected and designed to support both face-to-face as well as online learning (Weerasinghe, 2018). Thirdly, BL supports the accessibility of materials such as textbooks, and students' notes. Also, through a BLA, learning materials are made available in electronic handheld devices such as mobile phones, laptops, tablets, and e-readers (Kenney & Newcombe, 2011). Fourthly, BLA is used to support the traditional face-to-face teaching approach (Eggers, Oostdam & Voogt, 2021; Kenney & Newcombe, 2011; Weerasinghe, 2018). The real test of BL is the effective integration of two main components face-to-face and computer-mediated learning instruction such that it is not just adding on to the existing dominant method (Garrison & Kanuka, 2004). Fifthly, blended learning creates motivating learning environments (Eggers et al., 2021). BL can provide students with the option to select the type of learning environment that best meets their learning and scheduling needs.

Concerns-Based Adoption Model (CBAM)

The current study adopted the concerns-based adoption model (CBAM) since changing teaching methods, pedagogical tools, concerns and learning approaches by integrating learning technology is a way to enhance the 21st-century lives of both students and teachers (Almerich et al., 2016). The CBAM denotes a developmental process for accepting innovations in education, concentrating on individuals' enhanced use and experiences like the use of ICT to improve students' and teachers' learning (Garrison, 2021). As such, improved use of learning technologies in secondary schools is enhanced by teachers' strategies, learning environments, facilities, ICT services and school actions to adopt change.

In the 1970s, the Research and Development Center for Teacher Education created the CBAM (McREL.org, 2021; Hall & Hord, 2020). According to Khoboli and O'Toole (2012), the work of Frances Fuller served as the foundation

for the first iteration of the CBAM model. Additionally, the model takes advantage of teachers' worries about improving their teaching talents and capacity to improve student learning. The literature claims that twelve assumptions (principles of change) form the basis of CBAM (Donovan et al., 2007; Khoboli & O'Toole, 2012; Hosman & Cvetanoska, 2013):

> (1) change is learning; it's as simple and complex as that; (2) change is a process, not an event; (3) implementing change is a whole system effort; (4) organizations adopt change while individuals implement change; (5) The school is the primary organizational unit for change; (6) school-based leadership is essential to long-term change success; (7) facilitating change is a team effort; (8) interventions are key to the success of the change process; (9) appropriate interventions can reduce resistance to change; (10) all-way communication is needed all the time; (11) mandates can work; and (12) sustaining change requires additional time, interventions and leadership."

The CBAM model has increasingly been used in recent years to examine the use of computers in schools (McREL.org, 2021), specifically to address concerns like the efficiency of directed technological interventions. The CBAM consists of three distinct components: levels of use, innovative configurations, and stages of worry (Fuller, 1969, as in Hall & Hord, 2020). The stages of the concern process are designed to support and understand the range of excitement, perceptions and emotions that teachers experience regarding a specific change (e.g., ICT integration, and teaching methods) (Hosman & Cvetanoska, 2013). It should be noted that teachers are often confronted with new curricula and other modifications to the execution of school programmes and routines on a daily basis.

Moreover, the CBAM, as a theory to promote change, is therefore appropriate to analyse the process of teachers' adapting to and adopting technology vis-à-vis their teaching and learning skills, experiences and demands for professional development.

Besides, the CBAM is adopted in this study since it specifically focusses on stakeholders' perceptions of the adoption of a blended learning approach in secondary schools because stakeholders like teachers are at the core of the change process. As a result, it also provides a useful framework not only for examining learning environments for the adoption of blended learning but also for studying experiences and skills in the use of the blended learning approach. Although CBAM has been used in a wide variety of educational settings, it was developed and researched primarily within pre-primary, primary and secondary education settings. Its applicability to secondary schools may be limited by two core assumptions: First, CBAM is based on the assumption that the innovation will be adopted.

Second, its emphasis on implementing new teaching and learning approaches (such as blended learning) with fidelity, may not adequately address the complexity of change in secondary schools (Garrison, 2021). However, each of these factors may not apply during COVID-19, because the switch to ICT, blended learning, and online instruction is not something teachers and students make a decision about; they rather implement them. In

addition, ICT use, blended learning, e-learning adoption and online instruction require a countless level of commitment in ICT use.

In this study, the CBAM explains how secondary schools and teachers adopt and facilitate change that helps students understand, adopt, lead, learn, and monitor the complex process of change in education using ICT as a complex innovation that requires multifaceted design and training to implement. Furthermore, the model must take into account the specific concerns of teachers and secondary school administration who are being directed and required to make the necessary changes in order to use innovative learning technologies such as e-learning, blended learning and online learning.

Methods

Design

The study employed a mixed-methods research approach with a constructivist ontological premise. The premise concerns the social construction of reality. This study used the exploratory sequential design whereby qualitative data were collected first, followed by quantitative data collection. The choice of design was based on two aspects: research objectives and the fact that researchers wanted to familiarize themselves with the topic as it is used in the study context. The results of the qualitative component aided the research in developing a questionnaire to collect quantitative data. The findings were merged at the interpretation stage of the study.

Population and Sampling

The target population of this study was 23 public secondary schools in Morogoro Municipality. Two schools were selected to inform the study. The study was composed of the heads of schools, teachers, students, education quality assurers and municipal educational officers. A sample of 74 respondents was used to inform the study.The study used a stratified random sampling technique to obtain teachers and students. In addition, a purposive sampling technique was employed to select heads of schools and district school quality assurers. Table 1 summarises the categories of sampled participants.

Category of participants	Used Sampling techniques	Estimated Sample size	Attained Sample size
Secondary School Educational Officer	Purposive Sampling	1	1
Head of Secondary Schools	Purposive Sampling	2	2
Deputy Head of Secondary Schools		2	2
School Academic Officers		2	2
District School Quality Assurers	Purposive Sampling	4	2
Teachers	Stratified Sampling	32	28
Students	Stratified Sampling	35	35
Total number of participants		78	76

Table 1. Study Sample and Sampling Techniques

Instruments

This study used several data collection techniques including questionnaires and interview guides to obtain relevant data. The instrument used for gathering data for the empirical study consisted of several items when applied to different stakeholders (i.e., teachers, heads of schools and students). The questionnaire was divided into two sections: the first section involved demographic questions such as gender, age, educational level, work experience, and subject. To achieve validity, the study employed triangulation and back translation. Triangulation by the use of questionnaire and interview methods as well as a source of data was employed on heads of schools, educational officers and education quality assurers, teachers and students. Triangulation was used to ensure the complementarity of data gathered for the study. Further, participants used the Kiswahili and English language interchangeably; therefore, some questionnaires and interview guides in the English language were translated into Kiswahili language for some participants so as to help participants understand. Then, the responses were back-translated into the English language as a language of instruction in Tanzania secondary schools. The study performed a pilot study in the two public schools with the same characteristics as that of the expected actual study areas.

Data Analysis

Analysis of qualitative data was done through the use of content analysis. In the course of facilitating the analysis, the collected data were prepared through coding and editing. The interview method provided massive information that was necessary to be subjected to procedures of data management, reduction and construction of themes

related to the research questions. The coding process started after the text had been transcribed, translated and put into the Word documents. The matrix technique was used to create categories of concepts, and meanings and find the similarity between respondents' opinions. The processes involved iterative and intensive reading of the narrative text from every respondent. Collected quantitative data were cleaned up, summarized and then coded before they were taken into the IBM SPSS Statistics 26 for descriptive analysis. Descriptive analysed data were presented in tables, frequency and percentages.

Results and Discussion

In this section, results are presented and discussed based on research questions as they were collected and analysed, and as presented in the preceding section.

Research question 1: What are stakeholders' perceptions about the adoption of a blended learning approach in secondary schools? In this research question, researchers sought to establish secondary school teachers' perceptions of the blended learning approach. Perceptions of respondents were measured through two aspects including the understanding of the concept "blended learning approach" and attitude towards the practice of the blended learning approach in the studied secondary schools. Researchers used interviews and questionnaires to generate relevant information. The first interviewee was the school quality assurance officer who was asked to provide the conceptual meaning of the blended learning approach and he applauded:

> "Blended learning approach is the opportunity for a student to learn in different environments be in class or out of the classroom whereby he/she may utilise different technologies such as ICT to access learning content (QA, 14/05/2020 13:00hrs."

In congruence, when asked about his attitude towards the practice of a blended learning approach in secondary schools, taking into consideration resources (i.e., internet and electricity) constraints, the school quality assurance officer had the following to offer:

> "In our context [Tanzania], teaching and learning depend on physical classroom attendance, of which teachers are responsible to be in class on daily basis, I thought BLA can be positively endorsed, recognised and guarantee since using offline digital content is a milestone to both students and teachers ... meanwhile it makes the process of learning more accessible and convenient".

On the other hand, teachers were not very far from school quality assurance officers' understanding of BLA. Teachers appeared to be knowledgeable about BLA as they were able to offer several explanations. For example, one of the teachers from SS2 argued that:

> "To my understanding blended learning is an approach used in teaching and learning by the use of computers... it encourages the use of both personal and group learning through assistive

technologies...the technology things, the internet, gamification, learning platform, social media, and mobile learning combined together (SS2_teacher, 10/05/2020 09:30hrs.)".

Another teacher had the following to add:

"I have attended several training and workshop on the use of digital learning content and online learning platform... as a result, I can say that BLA is good to me and when used appropriately can provide better-quality integrated learning environment to both teachers and students (SS2_teacher, 16/05/2020 12:00hrs.)"

Further, interviewees from SS1 conceived blended learning as an embedment of traditional and modern technology. They argued that during the peak of COVID-19 in the country, schools were in a cessation situation, and were encouraged to use several measures in preparation for normality of teaching and learning. It was during that time some of the teachers in studied secondary schools heard about BLA. In support of that, one of the interviewed teachers emphasised that:

"The BLA is a technique of combining the traditional method and the new technologies using the internet and computer-connected devices that help students to gain more materials as they prefer (SS1_teacher, 08/05/2020 12:00hrs.)"

In the other interview, a deputy head of the school showed interest in the adoption of BLA by arguing that BLA is a good approach for both students and teachers, however, in the context of poor resources lamented that:

BLA is a good approach to enhance students personalised learning ...however, we still have as many as possible challenges including lack of internet connectivity and learning devices among our students" (SS2_teacher, 17/05/2020 12:00hrs.)"

On their side, students described blended learning as:

"To me, BLA is the means used in teaching using electronic devices such as computers, projectors and the like but also other old methods are applied in mixed ways (SS2_Student, 10/05/2020 14: 15hrs.)"

Data from the interviews shows that the respondents had a basic understanding of the blended learning approach. The concept of blended learning approach was understood as the method of using ICT in combination with traditional methods for the teaching and learning process and it can take place inside or outside the classroom. Moreover, another issue that was observed is that BLA made students active and partners in knowledge creation motivating students and creating critical thinking and, finally, adoption of the BLA can result in timely coverage of learning syllabi. The findings of the study helped to clarify respondents' perceptions of the adoption of BLA. They indicated that the adoption of BLA is imperative in enhancing teaching and learning in secondary schools. The findings of the present study avowed prior results by Lo et al. (2011) who conceived that BLA is a useful approach to

accessing teaching and learning materials. The findings are also corroborated by Vernadakis et al. (2011), who indicated that BLA is used to create a student-centred learning environment that motivates active and deep learning in students.

Further, a questionnaire was used to obtain information from teachers regarding their awareness of blended learning. Two questions were posed to measure the understanding and awareness of respondents about the blended learning approach. The responses are indicated in Table 2.

S/N	Respondents	Response		Total
		YES (F/%)	NO (F/%)	F/%
1	Teachers	21(75)	7(27)	28 (100)
2	Students	22 (66.7)	11 (33.3)	33 (100)

Table 2. Awareness of Respondents about Blended Learning Approach

Findings in Table 2 revealed that 66.7% of the students were aware of the concept of BLA as opposed to 75% of the teachers. These findings perhaps report that both teachers and students are cognizant of BLA. The discrepancies in awareness among students and teachers might be because some students and teachers are implementing the said learning approach but are not fully aware of the program. In the context of the Philippines, a study by Fernando (2020) found that awareness of blended learning style is somehow shallow in the Philippine setting of education because the learning style is not properly implemented. By awareness, it means that the knowledge gained through one's own perception or by means of information. According to a study by Hsu et al. (2018), teachers being aware of the blended learning approach had the potential to enhance children's long-term learning. Similarly, a study conducted in India by Maruthavanan & Devi (2020)., concluded that there was no significant difference in the awareness of the blended learning approach among students and teachers in the Madurai district. As a result, the study proceeded with measuring the theoretical understanding of the concept of blended learning. In doing so, respondents were asked to indicate their understanding of BLA. The descriptive responses are provided in Table 3.

S/N	Defining blended learning approach	Students	Teachers
		Frequency (%)	Frequency (%)
1	Learning by using other sources like computers, TV, learning systems, laptops and tablets not only from book sources	30(90.9%)	2 (7.1%)
2	Use of innovative learning technologies in combination with traditional modes of delivery like e-learning systems and other ICT facilities	2(6.1%)	25(89.3%)
	I don't know	1(3%)	1(3.6%)
	Total	33(100%)	28(100%)

Table 3. Teachers and Students Understanding of BLA

Table 2 shows that respondents have good theoretical knowledge of BLA. While about 90.9% of respondents (students) understood BLA as the learning system by use of ICT sources like computers, TV, the Internet, learning systems, laptops, and tablets; other respondents 89% (of teachers) indicated that BLA as an approach used in teaching and learning through a combination of various technology and traditional methods like use of computer, slides and other ICT facilities. However, the data presented implies that teachers were more knowledgeable about BLA than students.

Categorically, findings indicate that participants had a high theoretical understanding of the concept of BLA. This was an impressive observation since it provides ground to dig further into the nexus of theory and practice. The understating of respondents concerned with other scholars who attempted to provide the meaning of blended learning. As such, this study supports the previous studies that established respondents' understanding of the term blended learning as a learning approach (Rao, 2018). The type of learning that combines the traditional face-to-face model, with the e-learning model, thus benefiting from both methods and creating a good learning experience adds to their appeal (Lalima & Dangwal, 2017; Machumu & Zhu, 2017).

Research question 2: How do schools' learning environments support the adoption of a blended learning approach in secondary schools?

This study assessed the school learning environments that are supportive of the adoption of BLA. Students were assessed on the school learning environments focused on nine instrumental aspects. A summary of the results is presented in Table 4.

S/N	School Learning Environments (variables)	Rating Scale (1-2)			
		Agree		Disagree	
		F	%	F	%
1	ICT infrastructures computer lab	24	85.7	4	14.3
2	Availability of electricity i.e., lighting	25	89.3	3	10.7
3	Availability of school ICT teacher	22	78.5	6	21.5
4	School ICT facilities & services	18	64.3	10	35.7
5	Recommended academic websites i.e., ShuleDirect, TIE database	16	57.1	12	42.9
6	FQAs leaflet about blended learning	8	28.6	20	71.4
7	School IT technicians for technical support	15	53.6	13	46.4
8	The school ICT team with the Help Desk	11	39.3	17	60.7
9	Wireless equipment - wireless access points (WAPs) i.e., Tigo	5	17.9	23	82.2

Table 4. School Environment that Supports Blended Learning Approach

Table 3 shows that respondents perceived the existence of all ICT facilities and services that could support the adoption of BLA in schools.It was revealed that respondents agreed that schools have learning environments that support the adoption of a blended learning approach. As it stands from the findings, several services and facilities were available in some studied schools like wireless access points donated by mobile carriers like Tigo (cf., telecommunication company in Tanzania).

The study further explored students' views as to whether the school environment supports the implementation of a blended learning approach. Students were asked to identify their agreement or disagreement with the school environment in supporting their learning via BLA. The results are presented in Table 5.

S/N	School learning environment for BLA	Response	
		YES (F/%)	NO (F/%)
1	Do you think the school environment is supportive for you to learn via BLA	88	12

Table 5. Perceived Support of School Environment in Supporting BLA

The results in Table 5 show that 88% of respondents conceived that the school learning environment supports the adoption of BLA. It seems that school learning environments in studied secondary schools support students to learn via BLA. The general understanding that emerged from this study is that school learning environments must be supportive for students to learn via BLA. Some studies suggest that the primary focus for the adoption of BLA in schools should be teaching and learning environments which support its adoption like pedagogical tools, ICTs facilities and devices (Wang, Yang, & Wen, 2009; Maruthavanan & Devi, 2020). The study further inquired about the existence of some electronic and ICT facilities that were present in each school and that they are used for BLA. Students provided an inventory of ICT facilities that were present in the school.

The study also explored the availability of several appliances for possible implementation of a blended learning approach in studied secondary schools. To understand the kinds of appliances, present in each school the simple cross-tabulation method was applied and results are provided in Table 6.

S/N	ICT supportive facilities	Availability	Secondary Schools		Total
			SS1	SS2	
1	Desktop	Available	16	17	33
		Not available	0	0	0
		Total	16	17	33
2	Laptop	Available	16	16	32
		Not available	0	1	1
		Total	16	17	33
3	Radio	Available	2	0	2
		Not available	14	17	31
		Total	16	17	33
4	LCD projector	Available	14	15	29
		Not available	2	2	4
		Total	16	17	33
5	e-Book	Available	1	0	1
		Not available	15	17	32
		Total	16	17	33
6	TV	Available	0	4	4
		Not available	16	13	29
		Total	16	17	33
7	Internet cable	Available	16	17	33
		Not available	0	0	0
		Total	16	17	33

Table 6. Inventory of Supportive Facilities for Blended Learning Approach

Table 6 shows that some facilities were available in both schools while some were not present in all the schools. The following ICT facilities were available in both schools:Desktop, Laptop, LCD projector and Internet cables.

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Other facilities like radios, iPad tablets, e-book readers, TVs, and DVD players were not available in the two schools. In support of that, Olgun (2009) advocates that the existence of ICT facilities in schools facilitates a conducive school environment for the use of both traditional and innovative learning technologies in teaching and learning. The findings revealed that the schools had the following facilities: well-furnished computer labs, the internet and electricity which allow both teachers and students to engage in enjoyable learning via BLA. Similarly, studies found that students who lack devices or the teachers themselves lack the equipment to teach via BLA (Hayati et al., 2021). Equally, a study conducted in Indonesia by Tamah et al. (2020) found that the availability and accessibility of ICT facilities and services have an impact towards the adoption of BLA among teachers and students.

In the case of this study, the existence of electronic and accessible ICT facilities and services could serve very little if the schools lack ICT experts, ICT teachers and the ICT team and help desk. The findings of the study helped to clarify that schools were perceived to support BLA since they possessed ICT facilities and infrastructures. The presence of these elements confirmed that the BLA could be carried out in secondary schools (Cheok et al., 2014). Following this situation, they explored the presence of computer experts who could collaborate with teachers while implementing BLA. The following extracts generated from several respondents during the interview cemented our understanding:

> *We do not have a permanent computer expert at the school, but whenever there is a problem, I have noticed that there is a man out of the school who comes to handle the situation. However, most of the time I have seen two teachers who are helping others. I don't know exactly if they are well versed with the IT things (SS1_Student, 08/05/2020,12:00hrs.).*

In SS2, the student shared the following in response to the presence of a computer expert in the school.

> *I have never seen a specialised computer expert working here in the school apart from teachers who are knowledgeable about computer application. They are the ones we refer to as computer experts since they help us a lot. However, I once observed a person from outside who came to fix the internet connections as well as trying to explain some issues to our teachers (SS2_ student 10/05/2020, 14:15hrs.)*

It appears that the two schools used to hire ICT experts from outside in case of need. Otherwise, some teachers acted as IT experts but were not fully employed for that purpose. The findings affirmed prior results by Caporarello and Iñesta (2016), who once admitted that learning institutions need to have the necessary resources to equip the institution with adequate technology, pedagogical tools, team of experts in technology-enhanced learning. This study contends that schools demand further investments in ICT facilities, solutions and services in support of BLA (Kenney & Newcombe, 2011).

Research question 3: To what extent is the blended learning approach used in secondary schools?

This research question assessed the usage level of BLA in the studied secondary schools. Researchers developed two indicators to determine the level of BLA usage: the rate of teachers trained to facilitate blended learning usage, the extent to which blended learning is used by students and the possible challenges encountered in the application of BLA. The study presupposed that the level of adoption of BLA was indicated by the number of trained teachers, awareness of users about BLA, the level of BL application, and the limited number of challenges in its application. Teachers were asked to provide their responses as to whether they were trained about the use of BLA. The descriptive results are provided in Table 7.

S/N	Rate of teachers trained on BL usage	Response	
		YES(F/%)	NO(F/%)
1	Did you attend any in-service training on BLA usage	16 (57.1)	12 (42.9)
2	Do you apply BLA in teaching your subject	23 (82.1)	5 (17.9)

Table 7. Rate of Teachers Trained for Using Blended Learning Approach

Based on the findings in Table 7, 16(57.1%), teachers received training while 12 (42.9%) did not receive any training related to the application of BLA for teaching and learning. Furthermore, it was disclosed that 23 (82.1%) teachers attested to applying a blended learning approach in their subjects while 5 (17.9%) had nothing to do with the BLA approach in their subjects. These results suggest that the application of the blended learning approach in studied secondary schools is at a high level. The number of trained teachers was high equivalent to two-thirds of the respondents. As such, the importance of teacher training on the application of BLA was appropriate for the adoption of BLA because skilled teachers applied the knowledge, they had acquired to assist student learning. A study by Lalima and Dangwal (2017) supports this claim with the contention that among other preconditions for the use of a blended learning approach is to have well-trained teachers. Teachers are supposed to be vested with knowledge and skills regarding BLA application for successful adoption.

Moreover, teachers and students were provided with similar questions measured on two levels scale (*highly applied and least applied*). Table 8 provides the results generated from both teachers' and students' responses about the extent to which blended learning is used in studied secondary schools.

S/N	Level of blended learning use	Responses			
		Teachers		Students	
1	Identify the level of blended learning usage in teaching and learning	High applied F/%	Least applied F/%	High applied F/%	Least applied F/%
		20(71.4)	8(28.6%)	24(68.6%)	11(31.4%)

Table 8. Level of Blended Learning Approach Usage

Data presented in Table 8 revealed that BLA was very highly used in the studied secondary schools as perceived by 71.4% of teachers and 68.6% of students. However, 31.4% of students and 28.6% of teachers established the least use of BLA. Perhaps this might have been caused by challenges related to the lack of stable internet connectivity and ICT devices among teachers and students. Based on the findings, it can be reported that the extent of usage of BLA in studied secondary schools was relatively high by both students and teachers. The descriptive statistical results were congruent with the explanations provided by the headmaster of SS1 concerning the application of the blended learning approach. He asserted that:

> *I am impressed with the response of my fellow teachers since they have well received the project and they are devoted to make the blended learning a basic model of teaching. In short, almost all teachers apply the methodology in their lessons* (SS1_headmaster, 09/05/2020,14:45hrs.)

The words of the head of the school imply that the BLA is highly applied in the school, but a note was put in that the practice was in the pilot study. The findings provide a more nuanced understanding of conditions relevant to the adoption of BLA in secondary schools in developing countries like Tanzania as well as stakeholders' perceptions of BLA. The study concurs with that of Hayati et al. (2021) conducted among secondary school teachers in Malaysia and Indonesia. The study establishes that teachers, especially senior teachers, who are not trained with proper training and knowledge will have a hard time adapting to learning technology.

Conclusion

The findings of the study offer the following crucial conclusions: First, stakeholders perceived BLA as an essential and useful methodology for teaching and learning in secondary schools. And that if appropriately used, BLA increases the quality of education offered in secondary schools. Second, the learning environment in selected secondary schools was found to have several conditions for application of BLA and the same ICT facilities and

services were used by both teachers and students. The school environment facilitated the networking of teachers and improved the teaching approaches and methods that students were able to follow and enjoy what was taught. Third, the high application of BLA motivates students to participate actively in the creation of knowledge, and thus it improves their academic performances.

The results of this study have several implications. The findings may be useful to the government, school managers and heads of schools to foresee the possibility of recruiting and employing sufficient IT technicians in schools for the sake of facilitating support and the sustainability usage of BLA for the great benefit of teachers, learners, and the community at large. Also, the findings may help policymakers and educational stakeholders to focus on strategies for boosting awareness and efforts to integrate BLA into the school curriculum. Finally, based on the study findings, the following recommendations are made: Since there were some teachers who were reported to have not attended any INSET on the use of ICT and teaching using BLA, there is an urgent need for the government, NGOs, and other stakeholders to set aside resources and provide INSET on the same. The need to equip schools with electricity, and Internet connectivity and supply sufficient computers arises in order to make the learning environment friendly for BLA.

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