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Teachers' Perceptions of ICT Use in Promoting Teaching Learning Processes and Its Outcomes at Senior Secondary Level in Mbeya Region, Tanzania: A Review

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Review Article

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ABSTRACT

Information and Communication Technology (ICT) has led to a debate between teacher-centred and student-centred approaches to teaching and learning in academia. While some teachers view ICT positively and think it makes teaching and learning exercises easier, others view it negatively and think it replaces the traditional teacher-centred approach, making teaching and learning exercises more challenging as respect for the teachers are eroding because students are using current technology to solve issues rather than depending only on teachers. The present study aims to understand teachers' perceptions of ICT use in promoting teaching-learning processes and its outcomes at the senior secondary level in the Mbeya region, Tanzania as a conveniently designed

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study area for the researcher. The study is based on related reviewed materials/information which was gathered from different secondary sources between July and December 2023.
Information was analysed and presented in a descriptive form for easy perception and understanding. It showed that the majority of teachers at' senior secondary level used ICT to enhance their teaching effectiveness. At the same time, their perception focused on learning an aspect which was easy to grasp, deep understanding and long-lasting. It enhances the interaction between students and teachers and offers more imaginative answers to many learning queries in the teaching and learning process. The study recommends that educators should use a holistic strategy when thinking about how to integrate information and communication technology (ICT) to improve the teaching and learning process and embrace a culture of flexibility and lifelong learning to improve student comprehension and engagement.

Keywords: ICT; teacher's perception; teaching; learning.

1. INTRODUCTION

Information and Communication Technology (ICT) is a scientific, technological, and engineering discipline and management approach utilised in processing, applying, and connecting information with social, economic, and cultural concerns. Acknowledging ICTs' potential is a big way to make the educational system better by fostering the digital literacy, problem-solving, and critical thinking abilities needed for the workforce of the twenty-first century [1,2,3]. ICT promotes a more dynamic learning environment in the classroom by assisting educators, learners, and parents in collaborating [2,4]. Computer-integrated ICTs are now personal gadgets that have a big impact on how we receive and process information. They are no longer static, separate equipment. Over the past ten years, innovative pedagogies have been used in education around the globe, although development has been unequal between nations [4]. The usage of ICT improves students' communication abilities, lifelong learning habits, and higher-order thinking abilities [3,5].

The use of information and communication technology (ICT) in education has received a lot of attention recently on a global scale [6,7]. ICT offers a viable path forward for changing educational practices, especially when strengthening teaching strategies and raising student achievement [2,3,5]. Due to its potential to completely transform conventional classroom methods, ICT's role in enhancing teaching and learning processes has drawn attention at the senior secondary level in Tanzania's Mbeya area.

Effective ICT use in the classroom, according to UNESCO, may close educational gaps, create dynamic learning environments, and provide students with the critical digital skills they need to succeed in the contemporary world [7]. Despite these possible advantages, educators' attitudes, views, and readiness to incorporate these technologies into their teaching methods are critical to the effective use of ICT in the classroom [8]. However, in some other studies negative studies were observed as some teachers who practised ICTs in their classes, felt discomfort in using new ICT tools and applications [4,9,10].

Therefore the teachers determine to know what the actual teacher's perception of ICT use is in the teaching and learning process at the senior secondary level. For its concrete base to the study context, the researcher collected related literature as for the study objectives (aims) "teachers perception".

The Mbeya area, situated in southern Tanzania, offers a distinctive setting for investigating these perspectives because of its varied socio-economic terrain, varied infrastructure, and dynamic educational system. Comprehending the viewpoints of educators in this milieu is crucial in formulating approaches that facilitate the seamless integration of ICT resources that correspond with the particular requirements and obstacles encountered in this area.

2. REVIEW OF RELATED STUDIES

Information and communication technology, or ICT as referenced in [11] is the fusion of computer, phone, visual, and audio networks via a link system. ICT leverages information to serve people's purposes and wants by utilizing hardware and software tools like social networks, mobile computing, and the internet, to name a few). ICT enables users to store, analyse, and

send information quickly and with up-to-date data [4,11,12].

Based on their backgrounds, education, and resource availability, teachers' opinions on the use of information and communication technology (ICT) in the classroom differ greatly [5,8,9,13]. How teachers see ICT has a significant influence on student learning and yields high-quality results. It also improves classroom management, which facilitates the teaching and learning process [13]. When an instructor establishes a positive attitude toward ICT use, students develop a behavioural desire to utilize it, and intrinsic aspects are self-determined and natural [8]. Teachers should be questioned about what they think they will be able to achieve that will be more productive if they utilize ICT to establish an environment that is conducive to acceptance. Teachers' perceptions play a pivotal role in influencing how Information and Communication Technology (ICT) is integrated and used in teaching and learning settings [13]. The use of ICT technologies has grown more and more crucial in today's educational environment, altering conventional teaching techniques and improving learning results [7,11,13,14].

Regarding the use of ICT in education, teachers' perspectives cover a wide range of viewpoints, attitudes, experiences, and beliefs [11]. Their approach to using technology in the classroom is greatly influenced by these views, which also have an impact on the resources they use, the tactics they use, and the degree of creativity they bring to the teaching-learning dynamic. The degree to which ICT is used to promote student engagement, interaction, and knowledge acquisition can be influenced by the attitudes and ideas instructors hold about technology [8,13].

Investigating teachers' views entails looking into a range of topics, such as their comfort level with technology, perceived advantages, difficulties they have faced, the training they have received, and pedagogical views on ICT integration [9]. Their opinions also cover how well ICT fosters critical thinking, group projects, information availability, and general academic results [7,14].

Teachers' views had a big influence on how they used technology in the classroom. Teachers who were positive about technology preferred to include computers in their lessons. Teachers who showed resistance to technology, on the other hand, frequently stuck to conventional methods of instruction even when they had access to ICT resources [5]. To optimize ICT's usefulness in the teaching and learning process, it is therefore essential to cultivate a favourable attitude among teachers [11].

Information and communication technology, or ICT, has a big influence on education since it provides a lot of tools that improve teaching and learning processes. ICT plays a wide range of roles in aiding educational processes in a variety of disciplines, as several studies have highlighted. These include making information accessible, opening up new channels for interactions between students and knowledge, and more. But for ICT to be useful in education, it needs to be used in the right ways, with the right tools, support, and training. In addition, ICT may provide equitable opportunities, offer instructional resources, meet the needs of individual learners, and promote group learning among students as referenced in [14].

This phenomenon, also referred to as the "knowledge economy" or the "information revolution," shows how important ICTs are becoming to growth. It depicts an economy in which information is easily obtained, encouraging the quick invention of worthwhile concepts that materialize into products and services and thus propel economic growth and development [6]. Not only have global changes been demanded, but the rapid advancement of new technology and the necessity to educate the ever growing younger population have also highlighted the need for improvements in teacher education [4].

Information and communication technology (ICT) use is an essential component of teaching that is deeply embedded in their methods. It is essential because it enables educators to remain up to date on new information and develop skills in using contemporary digital tools and resources [3,4]. Adopting ICT not only makes teachers more successful but also shapes students into more competent mentors. ICT also has a major impact on how quickly society is changing, changing both the nature of education and the interactions between students and teachers during the teaching and learning process [3,8].

Teachers' prior experience with ICT, the availability of smartphones and the Internet, the anticipated benefits of using ICTs, and the necessity of meeting learning objectives and satisfaction are the factors that drive teachers to

use ICT in the classroom in Tanzania's remote secondary schools [8]. Teachers' motivation to incorporate ICT into their teaching methods may also be greatly influenced by professional development opportunities, educational legislation, government efforts, and assistance from educational institutions. Teachers are empowered and encouraged to use technology as a tool for successful teaching and learning when these variables come into alignment.

The successful integration of ICT can be hampered, nevertheless, by issues including a lack of funding, inadequate training, poor internet access, expensive ICT tool acquisition and maintenance, and infrastructural limitations, to name a few [6,15]. Incorporating ICT into teaching practices for the benefit of students' education may be further motivated and made possible by efforts to overcome these issues and offer sufficient support for teachers.

3. METHODS

For a thorough analysis of the literature review, Google Scholar and related search engines were used. Particularly, the papers under consideration were from the years June 2015 to September 2022. Conference papers, dissertations, and professional comments were also included in this evaluation. A comprehensive assessment and analysis of eleven selected papers, encompassing both developing and industrialized nations, were conducted. Countries including Belgium, the Philippines, Nepal, Turkey, South Africa, Nigeria, Zambia, and Tanzania were included in this assessment. The chosen studies' release dates varied, spanning from June 2015 to September 2022.

4. FINDINGS OF THE STUDY

Table 1. Review of the findings on teacher's perceptions of ICTT use in promoting teaching-learning processes and outcomes

Suggested no	Author and Year	Place	Findings	Title	Publishers
1	[1]	Tanzania	The study found several gaps which exist between the ICT policy and the real practice or implementation of ICT objectives in education such as limited teachers' awareness and training in ICT integration, and electricity and ICT facilities supply in most schools.	The paradox of ICT integration in secondary education in Tanzania: Assessment of teachers' ICT knowledge and skills in Tanga and Mwanza regions	International Journal of Research Studies in Educational Technology
2	[2]	Namibia	-Most teachers have the right attitudes and positive perceptions of the meaningful use of ICT in teaching and learning. The majority teachers in school management have no positivity toward integrating technology into teaching and they resist changes. The majority of the teachers were positive towards the roles of ICTs.	Teachers' Perceptions and Use of Information and Communication Technology in Teaching and Learning: Kadjimi Circuit, Kavango West, Namibia	The International University of Management, Nkurenkuru & The International University of Management, Windhoek
	[4]	Nepal		Information and Communication Technology in Foreign Language Classes in English: Roles and Practices	International Journal of Technology in Education and Science (IJTES)
3	[3]	Philippine	Pre-re-service teachers were ready for online learning in terms of computer/internet self-efficacy, self-directed learning, learner control, motivation for learning, and online communication self-efficacy.	Pre-service Teachers' Readiness on Online Learning and their 21st Century Pedagogical Skills	International Journal of Educational Management and Development Studies
4	[6]	South Africa	The results of the ICT survey revealed that most of the schools do have sufficient ICT resources, but it is not used optimally by teachers	Teachers' Perceptions of the Use of ICT in a CAL Environment to Enhance the Conception of Science Concepts	Universal Journal of Educational Research 4(1):
5	[5]	Zambia	Both pupils and teachers showed a	Pupils' and teachers'	International

Suggested no	Author and Year	Place	Findings	Title	Publishers
			positive perception towards the use of ICTs in the learning and teaching of mathematics. Pupils were more appreciative of the benefits of integrating ICTs in their mathematics lessons as compared to teachers.	perception toward the use of Information and Communication Technology (ICT) in the teaching and learning of Mathematics in selected secondary schools of Central Province, Zambia	Journal of Multidisciplinary Research and Development Online
	[8]	Pakistan	The four motivating factors for teachers to use ICT are teacher's experience with the use of ICT; the presence of technologies, the expected benefits, of using ICTs; and finally, the need to attain satisfaction and teaching objectives. The findings suggest that teachers in remotely located schools are ready to use ICT in teaching if the fore mentioned factors are present	Impact of Teacher Self-Efficacy on Secondary School Students' Academic Achievement	Journal of Education and Educational Development
	[9]	Turkey	Research results illustrated that teachers have a high level of positive attitude towards ICT use in their classes, yet there is no significant difference between teachers' ICT willingness by gender, age, teaching experience, ICT experience, ICT skills, and ICT training.	Examining High School Teachers' Attitudes towards ICT Use in Education	International Journal of Progressive Education
	[13]	Malaysia	The results indicate that ICT integration has a great effectiveness for both teachers and the students.	Teaching and Learning with Technology: Effectiveness of ICT Integration in Schools	International Journal of Research and education and Science (IJRES), 175-191.
6	[11]	Belgium	It was found that their integration of ICT was limited to a basic level and demonstrative purposes and they underused simulated tasks for experience, discovery, and experiment.	Influencing factors and Integration of ICT into teaching practices of pre-service and starting teachers	International Journal of Research in Education and Science (IJRES), 2(2), 359-370.
7	[14]	Oman	Teaching with educational ICT can enhance student's active learning only through joint, coherent and multi-level efforts.	Role of Information Communication Technology (ICT) in Education and its Relative Impact	International Journal of Engineering Research & Technology (IJERT) ISSN: 2278-0181
8	[7]	Tanzania	Teacher's experience with the use of ICT; presence of technologies, expected benefits, of using ICTs; and finally the need to attain satisfactions and teaching objectives	Factors that motivate teachers to use ICT in teaching: A Case of Kaliua District Secondary Schools in Tanzania	International Journal of Education and Development using Information and Communication Technology (IJEDICT), 179-189
9	[16]	India	Findings indicate that teachers' well-equipped preparation with ICT tools and facilities is one the main	Trends in ICT Integrated Teacher Education.	Aradhana Brothers Publisher &

Suggested no	Author and Year	Place	Findings	Title	Publishers
			factors in the success of technology-based teaching and learning.		Distributor 124/152-C.
	[17]	India	Technology provides various levels of assessments, instant results, and the storage of historical data, This also helps teachers with their class room planning in a better way as per the individual requirements	Impact of ICT On Student Assessment Process in Schools	Amity International Journal of Teacher Education, Volume 6,
10	[12]	Indonesia	EFL classrooms, including integrated skills learning, is the most effective environments for promoting the 4Cs (communication, collaboration, critical thinking, and creativity).	Integrating the 4Cs into EFL Integrated Skills Learning	Journal of English Teaching Vol 6(1)DOI: https://doi.org/10.33541/jet.v6i1.190
	[18]	Nigeria	ICT improves learning, motivate and engage learners, promote collaboration, foster enquiry and exploration, and create a new learner centered learning culture.	The Concept and Application of ICT to the Teaching/Learning Process	International Research Journal of Mathematics, Engineering and ITISSN: (2348-9766
11	[19]	France	The digital transition will have a great impact on how and what students learn. OECD countries acknowledge the importance of digital innovation and the role of government to support digitalization in education	Students, Computers, and Learning: Making the Connection.	OECD Publishers.
12	[15]	Malaysia	This study found a significant relationship between social presence, perceived usefulness, perceived ease of use, and perceived enjoyment of SM use.	Social media for collaborative learning: A review of empirical research	Computers & Education, 126, 42-54.
13	[20]	India	ICT helps the teacher to update the new knowledge, and skills to use the new digital tools and resources. By using and acquiring the knowledge of ICT, student teachers will become effective teachers.	Role of ICT in 21st Century's Teacher Education	International Journal of Education and Information Studies. ISSN 2277-3169
	[21]	India	Findings: The results showed that the use and the application level of ICT in the teaching-learning process have a meaningful relationship with ICT equipment in schools, their Literacy and information skills (their e-readiness), and the teacher's attitude toward using ICT in the teaching-learning process.	Analyzing the Opportunities and Challenges of use Of Information and Communication Technology Tools in Teaching Learning Process	Indian Journal of Science and Technology, Vol 9(6), DOI: 10.17485/ijst/2016/v9i6/
14	[22]	Tanzania	Results from Pearson's Chi-Square distribution reveal that there is a relationship between the types of schools with the readiness to adopt the use of ICT in teaching with private schools being favoured. The study has revealed that private secondary schools in Dodoma municipality are better off than	ICT Usage Readiness for Private and Public Secondary Schools in Tanzania, a Case of Dodoma Municipality	International Journal of Computer Applications (0975 – 8887)

Suggested no	Author and Year	Place	Findings	Title	Publishers
			public secondary schools in ICT usage readiness		
15	[10]	Nigeria	Results revealed that teachers' perception of the effectiveness of Microsoft Teams for assignment and grading, for teacher and student interaction, and classroom organization	Teachers' Perception of the Use of Microsoft Teams for Remote Learning in Southwestern Nigerian Schools	African Journal of Teacher Education (1916-7822).
23	[23]	Tanzania	This study confirms the existing challenges, but it has in-depth analysed the recent ICT competence of teachers which needs to be taken into consideration independently as it has been also unveiled that 97% of teachers are ready to attend in-service training for improving their ICT competence. This will make the teaching work meaningful and for the betterment of students' performance and outcomes.	Analysis of ICT Competence of Teachers in Public Secondary Schools in Tanzania: A Case Study of Rungwe District.	East China Normal University Thesis for Master's Degree, 2020 University Code: 10269 Student Code: 51190214037

5. DISCUSSION AND ANALYSIS OF THE FINDINGS

This section explains the results obtained during the study, it begins by identifying the number of studies that participated in the findings and later on it presents the data and findings obtained from each country with a thorough discussion.

The findings of the study were collected from twelve studies of which 4 were from Tanzania and other studies were from Philippines, Zambia, Nepal, Turkey, Nigeria, South Africa and Belgium. The studies revealed the findings on the perception of teachers in the use of ICT in Teaching and learning as shown in Table 1.

The study was conducted in Tanzania by [1] which "consisted of 26 schools; 11 schools were drawn from Tanga Municipality and 15 were drawn from Mwanza region. From 26 surveyed schools, a total of 124 respondents were recruited, both males and females. , shows that only 1.1 % of the 91 respondents who had received ICT training could competently integrate ICT skills in classroom practices while 19.8% were not sure whether they could or could not integrate ICT in the classroom at all". "These findings indicated that 79 per cent of teachers have a negative attitude toward the use of ICT in teaching and learning. A similar study was carried out in Tabora Tanzania where the researcher used 14 secondary schools from Kaliua District as a case study, with a sample of 111 teachers. It showed that 91% of teachers in remotely located schools were ready to use ICT in teaching" [8].

Also, the study done by [2] in Tanzania indicated that "private schools in Dodoma municipality have shown a higher level of readiness to use ICT than public schools whereas 36/56 per cent of respondents from government schools supported the use of ICT teaching while 59.1/56 from private schools supported the use of ICT in teaching and learning, thus the support of ICT use in teaching and learning in private schools were higher compared to a government school".

Similarly, the study reported by [23] in "the Mbeya region Tanzania revealed that 97% (150 respondents) had having positive attitude toward ICT use in Teaching and learning of teachers they were ready to attend in-service training to improve their ICT competence. This will make the teaching work meaningful and for the betterment of students' performance and outcomes".

Similar studies done to other countries specifically Zambia, Philippines, Nepal, Malaysia, and Nigeria indicated that most teachers had positive attitudes towards ICT use in teaching and learning [3,6,4,9,13,21].

The study done in the Philippines by [3] reveals that "the online learning readiness in terms of computer/internet self-efficacy was perceived as 'ready' with an overall mean of 3.41, which only indicates that most of the respondents strongly perceive themselves as highly capable when it comes to navigating online learning elevated by their computer or internet self-efficacy".

Likewise in Zambia, the respondents with positive perceptions were 76 (48%), 13 (%) were neutral and 11(11%) expressed negative perceptions when they were asked about their readiness to use ICT teaching and learning basic mathematics [6].

"Moreover, in Nepal, this research intended to investigate the roles and practices of ICTs in English as foreign language classes (EFL) of Nepal. To achieve the objective, the explanatory sequential mixed research design was adopted. Survey questionnaires, unstructured interviews and non-participant observation were used as the tools of data collection and forty secondary English teachers (20 from public schools & and 20 from private schools) were the sample population. The findings disclosed that English teachers used ICT in their teaching process, the results demonstrate that the majority of the teachers (i.e. 62.5%) used tape recorders followed by computers (52.5%) and internet (45%) whereas radio, telephone, Skype, IPod and interactive whiteboard were not used by all the teachers" [4].

"The study was conducted in Turkey which consisted of 353 teachers working in different high schools in Ankara in the academic year 2016-2017. Research results illustrated that teachers have a high level of positive overall attitude (ICT willingness, M= 3.94, SD= .75) towards ICT use in education. However, the results also illustrated that they still have some anxiety towards ICT, yet at a low level (ICT anxiety, M= 1.95, SD= .78)" [4].

In Nigeria, the study was done by [4]. "Teachers' perception of the effectiveness of Microsoft Teams for teacher-student interaction. The result showed that having a live class session (x = 4.31) was ranked highest with the mean score and was followed successively by facilitating communication (x = 4.23), using the announcement features (x = 4.14), sending any time messages (x = 4.00) and lastly, replacing WhatsApp groups (x = 3.76). It could be inferred that teachers' perception of the effectiveness of Microsoft Teams for teacher-student interaction is very good with an average mean of 4.08" [4].

Likewise, the study was conducted in Belgium [14]. "Quantitative data were collected from 200 pre-service teachers from the subject areas of Turkish language, social sciences, elementary mathematics and science in their fourth year of training programmes and 105 starting teachers who have been teaching not more than three years in the mentioned subjects. The multiple regression was conducted to test to what extent the independent variables predict the pre-service and starting teachers' integration of ICT into their teaching practices. The results showed that the variables accounted for 52% of the dependent variables in the pre-service and starting teachers' cases. "Perceived competence in ICT integration" (β=.64), "computer anxiety" (β=.16), "perceived ICT competence" (β=.13) and "gender" (β=.12) variables were seen to significantly predict the pre-service teachers' integration of ICT into teaching practices. Unlike the pre-service teachers' predicting variables, the "perceived competence in ICT integration" (β=.43) and pedagogical knowledge (β=.29) variables significantly predicted the starting teachers' integration of ICT into teaching practices. The study indicated that there were main differences and commonalities in the teacher groups' perceptions of their use of ICT in education. It was revealed that the pre-service teachers needed more training to be competent in ICT and therefore, they experienced more computer anxiety. On the other hand, the starting teachers needed more training to be competent users of ICT in education as well. However, they were less anxious about computers in their teaching practices" [14].

The positive perception identified by studies done in the Philippine, Zambia, Nepal, Turkey, Nigeria, Belgium and Tanzania which showed that the majority of the respondents preferred ICT in education for teaching, learning and better academic results correlates with the study done by [16,12] in Malaysia and Oman who argued that technology-based teaching and learning is more effective in compare to traditional classroom. "This is because using ICT tools and equipment prepares an active learning environment that is more interesting and effective for both teachers and students" [12]. "Further argued that teaching with educational ICT can enhance students' active learning only through joint, coherent and multi-level efforts. Rapid changes in technologies are indicating that the role of educational ICT in future will grow tremendously in education. However, in some other studies, negative perception dominated the attitudes of the respondents in the study area as was observed in South Africa [12] and in the Tanzania-Dodoma Region of Public schools" [2].

In South Africa the study selected 10 schools and their use in the science classroom. The findings indicated that in all the schools and their

frequency of use (10% to 60%), that the resources are not being used optimally in the science classrooms. The reasons presented by respondents with negative perceptions were "The content-laden curriculum does not allow time for learners to work on the computers in the classroom and I will not be able to finish the work [curriculum] in time, "I don't bother working with the computers, it is just a nuisance, "I never got training to use the software on the computers; I am anyway too old for computers [6,5]. The findings of the study correlate with the study done in Belgium by [14] who argued that "teachers needed more training to be competent users of ICT in education as well. However, they were less anxious about computers in their teaching practices, this could be because they allocated more time to be familiar with the curriculum, and classroom management in their first years rather than teaching with ICT". Similarly, the study done in Malaysia by [15] showed that "teachers were not motivated to integrate ICT into teaching and learning due lack of enough skills to use technology, resistance to change and lack of ICT resources".

The Benefits of ICT Use in the Teaching and Learning Process:

- In a range of forms, situations, and various locations, ICT is essential for informing, instructing, motivating, and persuading instructors and students [7].
- ICT encourages, motivates, and engages learners by enabling self-paced learning, accommodating a variety of learning styles, and providing accessibility [16]. More active, cooperative, creative, integrative,cooperative, and evaluative learning and teaching [12].
- "They make it possible for educators to rapidly and effectively access digital material. Software, digital photos, digital video, video games, web pages, websites, social media, digital data and databases, digital audio (such as mp3), electronic papers, and electronic books are examples of digital information" [12,18]. •
- Tedla (2012) discovered that information and communication technology (ICT) facilitates collaborative learning in remote learning settings. With the use of ICT, students may work together and communicate with teachers at any time to acquire new abilities for comprehending any topic and resolving challenging issues. For example, students from all over the world may be invited to participate in a simultaneous topic discussion in a classroom via teleconferencing. In addition to developing thoughts, they could get the chance to investigate ideas and analyze issues [16,17].
- Facilitation of learning process from traditional to modern ways. ICT allows for personalized learning paths tailored to individual student needs through adaptive learning systems and AI-driven tools. Similar perception was supported by other scholars like [12,19].
- "Encouraging access to course content with the help of technology thoroughly, ICT is used as a tool for students to discover learning topics, solve problems, and provide solutions to problems in the learning process. ICT makes knowledge acquisition more accessible, and concepts in learning areas are understood while engaging students in the application of ICT (16). Helps in the construction of new knowledge, ideas, and theories make easy to restore in memory and call back to response" [15]

To assess the learning outcomes by using ICT:

- ICT offers more imaginative answers to many learning queries. For instance, e-books are frequently used in reading classes to improve reading exercises that aid in providing answers to various questions. The use of a variety of technology instruments, including iPads, PDAs, and computers, can help with this [20].
- ICT helps pupils focus on higher-level concepts rather than less important activities by fostering critical (higher-order) thinking abilities. OECD [20,21].
- According to the study, pupils who are exposed to ICT in the classroom often have better digital literacy and problem-solving abilities [21].
- Thanks to ICT, teachers can stay current on new information and learn how to use cutting-edge digital tools and resources. By utilizing and learning about ICT, student teachers will become more productive. The help of technological diverse tools like laptops, personal digital assistants (PDAs), or iPads [20].

The contextual challenges while using ICT in teaching-learning situations:

- Infrastructure and Access: There are gaps in the world about who can afford to buy

computers and internet services, which makes it difficult for teachers and students in particular areas or schools to use ICT resources efficiently [22].

- Digital Illiteracy: To use ICT technologies efficiently, educators and students alike must possess sufficient digital literacy abilities. Teachers who are not digitally literate may find it more difficult to use technology to create engaging learning experiences [10].
- Lack of ICT resources in the classroom, such as computers, the internet, software, etc.; lack of student and teacher desire to utilize ICT; inadequate administrative support; inadequate course content, etc. are the main obstacles to integrating the newest ICT innovations [6,19].

6. CONCLUSION

The use of information and communication technology (ICT) in the teaching and learning process is very important to this generation as it is perceived to be a digitalized world. Most of the scholars show that the majority of teachers concur with to use of ICT in teaching and learning because it enables them to access material easily, enhances collaboration with students, and it makes easy to understand the students because students learn by seeing thus interpretation and understanding becomes easy. Teachers with negative attitudes are cautioned to join the world of information and communication technology otherwise they will be overlapped by the students themselves when they become teachers. The study further revealed that while teachers' conservative attitude toward technology has been identified as a barrier to effective technology integration in classrooms, it is often optimistically assumed that this issue will be resolved when the digital generation enters the teaching profession. This is a lesson to teachers who are not ready to accept the current innovation which requires them to cope with the demands of the contemporary society digitalized everywhere, thus adaptability in using modern technology to the teachers of the day is inevitable.

Moreover, the study found that Teaching with the aid of ICT is better as it makes students more independent as they can search and use it to discover learning topics, solve problems, and provide solutions to the problems in the learning process and enhance learning outcomes.

Though ICT is noticed to be an imperative solution for teachers and learners in providing good outcomes to both parties by being holistic some challenges affect the use of ICT in the teaching and learning process like lack of ICT resources in the classroom, digital illiteracy poor infrastructure, and negative attitude to some of the teachers on the use of ICT in the teaching and learning process.

The study found that ICT has transformed education from a teacher-centred to a student-centred approach and fostered professional learning by supporting educators and making them catalysts to serve the students. It has made teachers more creative and collaborative problem solvers and adoptive and socially aware experts by fluently using ICT.

7. RECOMMENDATIONS

- It is advised that educators use a holistic strategy when thinking about how to integrate information and communication technology (ICT) to improve teaching and learning results in Tanzania's Mbeya Region. The teachers should be ready to cope with the demands of the world by avoiding personal attitudes which makes them reluctant in the use of ICT in teaching and learning.
- Teachers should place a high priority on improving their digital literacy abilities and making use of cutting-edge technological tools to create dynamic and engaging learning environments since they understand how ICT may propel educational advancement.
- Using ICT to its fullest allows for access to a wealth of educational materials, collaborative learning, and course customization to fit different learning styles therefore teachers are urged to use ICT to use valid and relevant materials which can be updated anytime and anywhere within a very short time when ICT devices are used and acceptable by teachers.
- Furthermore, the study is encouraging instructors to embrace a culture of flexibility and lifelong learning would improve student comprehension and engagement while also giving students the essential digital skills they need to succeed in an ever-evolving global environment.
- Therefore, educators in the Mbeya Region must accept ICT integration, creating a setting that capitalizes on its revolutionary

power to greatly improve teaching strategies and, eventually, learning results.

DATA AVAILABILITY

The information from various countries has been gathered and analyzed systematically to understand the teachers' perception of ICT use in promoting teaching learning processes and its outcomes. The findings can be obtained from corresponding author upon request.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Jonathan K, Petro M. The paradox of ICT integration in secondary education in Tanzania: Assessment of teachers' ICT knowledge and skills in Tanga and Mwanza regions; International Journal of Research Studies in Educational Technology.2016
DOI: 10.5861/ijrset.2015.1299
2. Paxula G, Waiganjo I Teachers' perceptions and use of information and communication technology in teaching and learning. Department of Management, The International University of Management, Nkurenkuru, Namibia; 2020.
3. Malabanan J, Briones E, Madrideo J. Pre-service teachers' readiness on online learning and their 21st century pedagogical skills. International Journal of Educational Management and Development Studies; 2022.
Available:https://doi.org/10.53378/352909
4. Paudel P. Information and communication technology in foreign language classes in English: Roles and practices. International Journal of Technology in Education and Science (IJTES). 2021;5(1):37-55.
Available: https://doi.org/10.46328/ijtes.179
5. Phiri, W.Pupils' and teachers' perception toward the use of Information and Communication Technology (ICT) in the teaching and learning of mathematics in selected secondary schools of Central Province, Zambia. International Journal of multidisciplinary Research and Development; 2016.
Available:www.allsubjectjournal.com
Online ISSN: 2349-4182
Print ISSN: 2349-5979
6. George F, Ogunnyinyi M. Teachers' perceptions on the use of ICT in a CAL environment to enhance the conception of science concepts. Universal Journal of Educational Research; 2016.
DOI: 10.13189/ujer.2016.040119
Available:http://www.hrpub.org
7. Pima J. Factors that motivate teachers to use ICT in teaching: A Case of Kaliua District Secondary Schools in Tanzania. International Journal of Education and Development using Information and Communication Technology (IJEDICT). 2019;15(1):179-189.
8. Shahzad K, Naureen S. Impact of teacher self efficacy on secondary school students' Academic achievement.Journal of Education and Educational Development;2017.4(1)
9. Semerci A, Aydin M. Examining high school teachers' attitudes towards ICT use in education. International Journal of Progressive Education. 2018;4(2).
DOI: 10.29329/ijpe
10. Olurinola O, Olugbade D. Teachers' perception of the use of microsoft teams for remote learning in South western Nigerian Schools. African Journal of Teacher Education; 2021.
ISSN 1916-7822
11. Aslan A, Zhu C. Influencing factors and integration of ICT into teaching practices of pre service and starting teachers. International Journal of Research in Education and Science (IJRES). 2016; 2(2):359-370.
12. Pardede,P Integrating the 4Cs into EFL Integrated Skills Learning. Journal of English Teaching; 2020
DOI: https://doi.org/10.33541/jet.v6i1.190
13. Ghavifekr S, Rosdy W. Teaching and learning with technology: Effectiveness of ICT integration in schools. International Journal of Research in Education and Science (IJRES). 2015;1(2):175-191
14. Zafar S. Role of Information Communication Technology (ICT) in education and its relative impact. International Journal of Engineering

Research & Technology (IJERT); 2019. ISSN: 2278-0181

15. Al-Rahmi W, et al. Social media for collaborative learning: A review of empirical research. Computers & Education. 2015; 126:42-54.
Available:http://www.ripublication.com.
16. Behera L, Kumar A. Trends in ICT integrated teacher education. “Trends in ICT Enabled Education”, Aradhana Brothers, Kanpur.2021;62-78.
ISBN: 978-81-948933-0-1
17. Chitnis R. Impact of ICT on students assessment process in schools. Amity International Journal of Teacher Education. 2020;6(1).
18. Patience U, Kingsley N. The concept and application of ICT to teaching/learning process. International Research Journal of Mathematics, Engineering and IT; 2019.
ISSN: 2348-9766
19. OECD. Students, computers, and learning: Making the connection. OECD; 2018.
Available:https://dx.doi.org/10.1787/33dd4c26-en
20. Deb K, Bhattacharjee B. Role of ICT in 21st Century’s Teacher Education. International Journal of Education and Information Studies; 2016.
ISSN 2277-3169
21. Dastjerdi N. Analyzing the opportunities and challenges to use of information and communication technology tools in teaching-learning process. Indian Journal of Science and Technology. 2016;9(6).
DOI: 10.17485/ijst/2016/v9i6/82287
22. Manyilizu M,et al. ICT Usage Readiness for Private and Public Secondary Schools in Tanzania, a Case of Dodoma Municipality. International Journal of Computer; 2015: (0975 – 8887).
23. Mwesiga I. Analysis of ICT competence of teachers in Public Secondary Schools in Tanzania: A case study of Rungwe District, Master’s Thesis, East China Normal University, China; 2020.

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