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Facilitating Accommodation of Learners with Disabilities in Summative Assessment of Literacies in Tanzania through Mobile Application

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ABSTRACT

Summative Assessment of Language Literacies in Tanzania is administered in the form of a Paper-and-pencil assessment. This kind of assessment hardly accommodates learners with disabilities such as visually impaired ones because it does not allow adjustment of the font size to suit the reader's needs. As a result, such students might end up being judged as failures in such assessments while their failure is attributed to the nature of the assessment rather than their lack of competence in language literacies. Therefore, to improve the existing situation, the present study investigated the contribution of mobile applications to accommodating learners with diverse needs in taking language literacies assessments. We adopted qualitative action research using interviews, focus group discussion, observation, and reflection as data collection methods from one language teacher and ten standard VII students who were selected purposively. We analyzed data deductively through coding, categorizing, and relating data to available conceptual constructs. Findings show that mobile application makes language assessment more accommodating because of its flexibility in terms of presentation, response delivery, and locations and time given. The study calls for the National examination council in Tanzania to consider the integration of technology in language literacies assessment to maximize the learning opportunities for learners with disabilities. Also, teacher education should empower teachers on the use of technology in their classrooms.

Keywords: Accommodation;Summative Assessment; Language literacies; Mobile application; Tanzania

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INTRODUCTION

Accommodating learners with disabilities such as learners with visual impairment, hearing impairment, and attention disorder, to mention a few, is a must requirement of summative assessment in any inclusive classroom. This is because failure to accommodate learners with disabilities hinders such learners from demonstrating their potential skills, which makes assessment outcomes less reliable (Bolt & Roach, 2009; Gregg, 2009). As Gregg (2009, p.2) underscores, "Accommodations adjust how instructional or testing situations are presented and/or evaluated so that individuals with documented disabilities can learn and/or demonstrate their learning in a fair and equitable fashion." Given the significance of the summative assessment outcomes in making decisions, these learners could face unfair decisions such as not being selected for a higher level of education based on their low performance that resulted from lack of full access to the test. Consequently, the search for means through which learners could be accommodated has become one of the focal points of contemporary research.

Studies have indicated that computer technologies including mobile technologies such as tablets, smartphones, and laptops have the potential to facilitate the accommodation of learners with disabilities in assessment (Ahmad, 2015; Skiada et al., 2014). Bolt and Roach (2009, p. 53) posit, "With advances in technology, new tools can often serve intervention and accommodation purposes and may ultimately promote student learning in very meaningful ways." This shows the extent to which could serve teachers in their struggle to accommodate learners with disabilities. In encouraging educators and students to embrace technologies with no hesitation, Bolt and Roach (2009) argue that these technologies have become part of human life as they are used in day-to-day activities. This implies that using technologies in the classroom should not be considered as a deviation from norms but rather as a way to cope with new norms through which our recent survival is dependent. Therefore, it can be argued that it is high time for education programs to consider technologies as vital tools for supporting the accommodation of learners with disabilities and orienting them to the new norms.

Considering the potential role of mobile technologies to improve language learning (Haron & Adi Kasuma, 2021; May, 2018) and accommodating learners with disabilities in assessments, they have been adopted in various global contexts in language literacies' assessment and thus moving away from paper-pencil assessment (Lin & Lin, 2016). However, the Tanzania primary education system still assesses language literacies summatively through the paper-pencil mode of assessment, which endangers learners with disabilities. Therefore, being concerned with this situation, as researchers and teacher educators, we set out to investigate how we can employ mobile applications to facilitate the accommodation of learners with disabilities in the summative assessment of language literacies in Tanzania primary education.

RESEARCH QUESTIONS

Main research question

How can we accommodate learners with disabilities in summative language assessment through a mobile application?

Subsidiary questions

1. What are the current practices of language literacies' summative assessment to accommodate learners with disabilities?
2. What are the forms/categories of accommodation observed by students and teachers in taking language literacies' assessments through mobile applications for the sake of facilitating accommodation?
3. What are the challenges associated with accommodating learners with disabilities in language literacies' assessment through mobile applications?

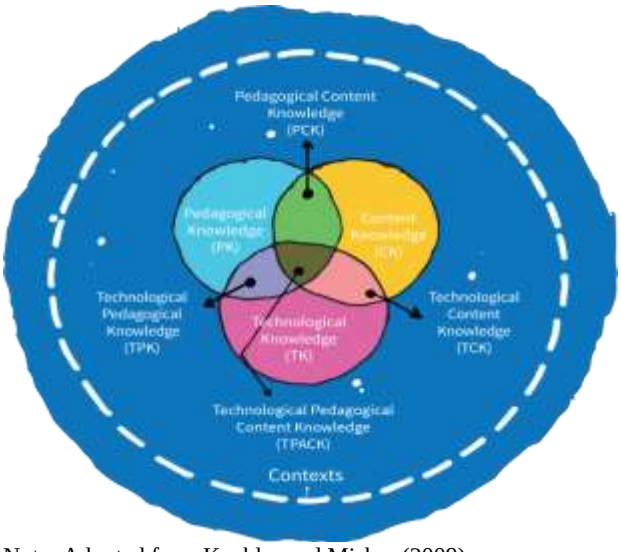
The rest of this article is organised in the following fashion. Section 2 presents a discussion of the concept of accommodation for learners with disabilities in assessments. In subsection 2.0, we have presented the theoretical framework. The concept of accommodation and learners with disabilities have been discussed in subsection 2.1. The use of mobile applications in accommodating learners with disabilities in language literacies' assessment is discussed in subsection 2.2. In subsection 2.3, we have discussed the experience of using mobile applications in global contexts. This is followed by the discussion on the accommodation of learners with disabilities in language literacies' assessment in Tanzania primary education. In Section 4, we have presented the conceptual framework of the study. In Section 5, we presented the methodology, followed by the presentation of findings and discussion of findings in Section 6 and 7 respectively.

THEORETICAL FRAMEWORK

The present study adopted the Technological, Pedagogical, and Content Knowledge (TPACK) framework as proposed by Koehler and Mishra (2009). The framework requires teachers to possess technological, pedagogical, and content knowledge for them to effectively use technology in the classroom. Based on this, technology can only facilitate learning if the teacher can operate technological tools in a way that aligns with teaching content as well as the appropriate teaching strategy for the respective content. For example, if a language teacher is teaching students on how to write a report, the teacher should know well how the report is written and should use technology in a way that allows interaction among students and between students and the teacher. Therefore, this means all three pieces of knowledge should be integrated in the way that they influence each other as shown in Figure 1.

This framework is relevant to the present study because the main purpose of the present study is to explore ways to employ mobile applications in accommodating learners with disabilities in assessments of language literacies. In this endeavor, mobile applications represent the technological tools, assessment items represent the content, and assessment strategies represent the pedagogical knowledge. Therefore, contemplating how to use mobile applications to accommodate learners with disabilities in language literacies assessment entails seeking how to align together mobile applications (technology), assessment items (content), and assessment strategies (pedagogy), which reflects the TPACK framework.

Figure 1
Technological, Pedagogical, Content Framework



Note: Adopted from Koehler and Mishra (2009)
Source: https://www.schoology.com/blog/tpack-framework-explained

THE CONCEPT OF ACCOMMODATION OF LEARNERS WITH DISABILITIES IN ASSESSMENT

The accommodation has emerged as the result of the Universal Design (UD) framework that requires education contexts to create a friendly environment for all learners to realise their potential regardless of their disabilities (Gregg, 2009; Thurlow & Kopriva, 2015). According to Thurlow and Kopriva (2015), accommodations are changes to materials or procedures that provide students access to instruction and assessments and improve the validity of assessment results for students who need them. Some of the classroom practices that could be regarded as accommodating learners with disabilities include producing large print for learners with visual impairment, braille for blind students, and visual-audio text for learners with hearing impairment, among others (Abedi, 2012; Bolt & Roach, 2009; Abedi et al., 2020; Keyvanfar et al., 2019; Turkan et al., 2019). Therefore, accommodation of learners with disabilities is related to anything that helps learners with disabilities access education materials similar to those without disabilities.

There are various categories or forms of accommodation related to assessment. The major categories include presentation, response, setting, and time (Bolt & Roach, 2009). Presentation is related to designing the test in a way that learners with disabilities can access without difficulties (Bolt & Roach, 2009). For instance, providing written instructions to the hearing impaired students could be categorised as presentation-accommodation because it enables such students to understand the instruction with easiness compared to oral text. On the other hand, response-accommodation is the flexibility of the test to accept multiple forms of responses such as audio, other languages, and written text, to mention a few so that learners who cannot respond with certain response forms would not be disadvantaged. Consummating with response-accommodation is setting-accommodation that requires learners to be placed in various test settings according to their needs (Bolt & Roach, 2009). This is especially for learners with attention disorders and physical disabilities (Cortiella, 2005). Lastly, time-accommodation is the extension of test time for learners with disabilities based on the assumption that their disabilities hamper their speed. Therefore, it can be argued that there is no single accommodation type that fits all disabilities. Consequently, teachers have to find the best one for the respective disability.

However, scholars agree that there is no fit for all accommodations. This is because accommodation that can help learners with visual impairments in a certain context might be useful to others with similar disabilities because of the difference in their degrees of disabilities. Also, there is a possibility that accommodation that suits a certain test might be considered modification in another similar test if it appears to manipulate the test in the sense that it fails to test what was intended to be tested (Abedi, 2012). For instance, the use of a dictionary in a language reading test whose purpose is to test learners' proficiency in vocabulary, makes such a test less valid because the learners may use the dictionary to understand vocabulary rather than using her/his knowledge. Consequently, Cortiella (2005) calls for continuous evaluation of the accommodation strategies. Therefore, it is clear that choosing an effective accommodation type requires the teacher to critically analyse the nature of learners' disabilities as shown in Table 1.

Table 1
Aspects to Consider when Choosing Accommodation for Assessment

	Who can benefit	**Questions to ask**	**Examples**
Presentation accommodations	Students with print disabilities, defined as difficulty or inability to visually read standard print because of a physical, sensory, or cognitive disability	• Can the student read and understand directions? • Does the student need directions to repeat frequently? • Has the student been identified as having a reading disability?	• Large Print • Magnification Devices • Human Reader • Audio Tapes • Screen Reader • Talking Materials (calculators; clocks, timers)
Response accommodations	Students with physical, sensory, or learning disabilities (including difficulties with memory, sequencing, directionality, alignment, and	• Can the student use a pencil or other writing instrument? • Does the student have a disability	• Scribe • Note-takers • Tape Recorder • Respond to Test Booklet • Spelling and Grammar

	organisation).	that affects his ability to spell? • Does the student have trouble with tracking from one page to another and maintaining her place?	devices • Graphic Organisers
Timing & scheduling accommodations	Students who need more time, cannot concentrate for extended periods, have health-related disabilities, fatigue easily, special diet, and/or medication needs.	• Can the student work continuously during the entire time allocated for test administration? • Does the student tire easily because of health impairments? • Does the student need shorter working periods and frequent breaks?	• Extended time • Frequent Breaks • Multiple testing sessions

Setting accommodations	Students who are easily distracted in large group settings concentrate best in small groups.	• Do others easily distract the student? • Does the student have trouble staying on task? • Does the student exhibit behaviours that would disrupt other students?	• Change of room or location in the room • Earphone or headphones • Study carrels

Note: Source: Coritella (2005)

THE USE OF MOBILE APPLICATIONS IN ACCOMMODATING LEARNERS WITH DISABILITIES IN LANGUAGE LITERACIES' ASSESSMENT

Research shows that the use of mobile applications to facilitate accommodation of learners with disabilities in language assessment is significantly increasing (Ahmad, 2015; Benmarrakchi et al., 2017; Lin & Lin, 2016; Mahoney & Hall, 2017). Such an increase in the adoption of mobile applications might be attributed to their functionality, accessibility flexibility, and affordability. According to Ahmad (2015), cost, usability, and accessibility, among others, determine the choice for assistive technology to be used in classroom accommodation. Therefore, the advancement of technology proves to be the best option for accommodating learners with disabilities in the classroom contexts.

There is an endless list of mobile applications for accommodating learners with disabilities in language literacies assessment. Some of these can accommodate multiple disabilities while others can accommodate only a single disability. For instance, Mahoney and Hall (2017) differentiate the potential use of two website-based applications-Newsela and Plicker arguing that Newsela can save for time extension and presentation accommodation while Plicker can only be used for giving immediate feedback. Besides, these mobile applications can be differentiated by their mode of accessibility whereas some are accessed freely while others are sold. However, it is important to note that in choosing any of the available mobile applications, one should focus on potential aspects of the mobile application to accommodate the type of disability in his or her class (Abedi, 2012; Ahmad, 2015). Table 2 provides various aspects of

mobile applications that can accommodate various disabilities related to language literacies assessment. Such aspects include the nature of the targeted disabilities, the availability of technological tools, and the type of accommodation one focus to implement. For instance, based on Table 2, attention disorder and reading difficulties could be mitigated by using various tools such as electronic books and electronic devices. However, since the very same degree could vary and the accessibility of the suggested accommodating devices differs from one country to another, it implies that the teachers from different contexts might be dealing with a diverse degree of similar disabilities using different devices. Therefore, arguably, the choice of mobile applications can hardly be relied on what has been done in other contexts hence the need for the present study in the Tanzanian context despite the presence of similar studies in other contexts.

Table 2
Guidelines for Choosing Mobile Application for Accommodating Learners with Disabilities in a Language Literacies' Assessment

Language Literacies	Students to be Accommodated	Aspects of appropriate Mobile Applications
Reading	For students having difficulty in reading and understanding written text and in paying attention to the reading assigned.	Electronic books, Book adapted for page-turning, Single-word scanners, Predictable texts, Tabs, Talking electronic devices/software.
Writing	For students having a problem in writing or composition.	Pen/Pencil grips, Templates, Word processors, Word card/book/wall, software, Spelling/Grammar checker, Adapted papers.
Vision	For students who have difficulty in seeing or lack complete vision.	Magnifier, Screen Magnification, Screen Reader, Braille Large Print Books, CCTV, Audio lessons Tapes
Hearing	For students who have difficulty in hearing or are absolute hearing impaired.	Hearing Aids, Pen and paper, Signaling Devices, Closed Captioning

Note: Source: Ahmad (2015)

EXPERIENCE IN USING MOBILE APPLICATIONS IN GLOBAL CONTEXTS

It is evident from research that mobile applications can accommodate learners in their language literacies' learning as shown in Table 3. In this section findings and implications from these studies concerning the present study are discussed.

Table 3
Studies from Global Contexts on the use of Mobile Application to Support Learners with Disabilities in Language Literacies' Learning

Study	Study Context	Study Focus	Findings
(Nordström, 2018)	Sweden	use of assistive reading and writing technology (primarily with text-to-speech, TTS, and speech-to-text, STT functions) for students with severe difficulties with reading (study III and IV).	Increased reading speed and motivation Teacher support influenced the improvement of the learners.
(Stauter et al., 2019)	Online	Systematic literature of published research on the use of assistive technologies for accommodating learners with disabilities.	Use of AT for access method included (microswitch, interface, or mouse), computer (laptop, desktop; portable iPad® or iPad2®), augmentative and alternative communication (AAC; picture communication system, SGD), and software (Microsoft® PowerPoint, Clicker 5, visual and auditory scanning software. The application of

			such digital tools improved the reading skills of learners.
(Naraian & Surabian, 2014)	General	Propose a frame for preparing teachers to use assistive technology.	Be oriented from teacher education. Be dispositioned(user perspective) towards technology. Should be prepared to advocate the availability of technologies for supporting.
(Lin & Lin, 2016)	Canada	Examining the effectiveness of the use of accommodation for students with learning, behavioral disorder, and exceptionalities writing.	The use of an application such as Read aloud improved the performance of learners with disabilities.
(Skiada et al., 2014)	Greece	Develop an application 'Easylexia' for supporting learners with reading difficulties.	Preliminary results showed improvement among learners.
(Benmarrakchi et al., 2017)	Morocco	Examining the use of online application-based text among learners with disabilities and those without disabilities.	Lack of compatibility between application and Arabic language is the major challenge.

From Table 3, there are four emerging issues from global experience on the use of mobile applications to support learners with disabilities in language learning literacies including assessment. First, all studies show that the use of mobile applications improves the learning of language literacies among learners with disabilities. This implies the need for the introduction of mobile applications in Tanzanian contexts to improve the learning condition of learners with disabilities. It is therefore arguable that such a lesson from global contexts makes the present study a significant one.

Second, from Table 3, one can find that various contexts opted for the use of various applications. For instance, Lin et al. (2016) report the use of Reading aloud application while Sakiada et al (2014) reports the design of Easylexia. This is related to the third issue, Table 3 shows that various contexts faced different challenges. For example, Benmarickchi et al. (2017) report the incompatibility of the Arabic language with the online application as the major challenge. In contrast, Nordstrom (2018) noted that the degree of teacher support to learners was the determinant factor for the improvement, which might sound like those who did not provide enough support hindered students' satisfaction. From these issues, one can argue that, since Tanzania is a different context from where these studies were conducted, we cannot rely on the present studies to implement the use of the mobile applications to support learners with disabilities. Thus, the need for the present study.

The fourth issue is related to the proposed framework for preparing teachers to use technology for accommodating learners with disabilities. Based on Narain and Sarabian (2014)'s framework, teachers need to experience the use of technology in a context where they can apply it. This implies the need for exploring the use of mobile applications in school settings where it is supposed to be used. Consequently, the need for this study is inevitable despite the present evidence from other contexts on the use of mobile applications for accommodating learners with disabilities.

In summary, the experience of using mobile applications to support learners with disabilities in language literacies' assessment from global contexts provides a basis for introducing applications in our school contexts. However, they do not indicate a practical way in which such mobile applications can be integrated into our contexts. Therefore, this makes the present study a valid one.

ACCOMMODATION OF LEARNERS WITH DISABILITIES IN LANGUAGE LITERACIES' ASSESSMENT IN TANZANIA PRIMARY EDUCATION

Since Tanzania is among the countries that implement inclusive education policy, there has been an increase in research related to the accommodation of learners with disabilities as shown in Table 4. In this section, findings and implications from the reviewed studies are critically discussed.

Table 4
Experience in the Use of Mobile Applications to Accommodate Learners with Disabilities in Tanzania Education Context

Study	Study focus	Findings
(Lehtomäki et al., 2014)	Providing an overview analysis of research on learners with disabilities from 1998 to 2008.	There is low consideration of learners with disabilities due to the lack of teacher training and unfavorable environment for supporting inclusive education.
(Hofman & Kilimo, 2014)	Investigating factors related to teachers' attitude in supporting learners with disabilities.	Lack of teacher training in special education and lack of experience influence negative attitudes among

		teachers towards learners with disabilities.
(Tungaraza, 2014)	Investigation of inclusive practices in Tanzanian education.	There is low evidence for the presence of inclusive practices mainly because majority of teachers are not trained to accommodate learners with disabilities.
(Grönlund et al., 2010)	Assess the effective use of assistive technology to support learners with disabilities.	There is low use of assistive technology and most of them are low technology.
(Mapunda et al., 2017)	Assess if there a school practices to accommodate learners with special needs in pre-primary schools in Dodoma municipality.	The teaching is without assistive devices.
(Thompson, 2017)	Provide evidence from the literature on the practices for accommodating learners with disabilities in Tanzania.	Limited use of assistive technologies.

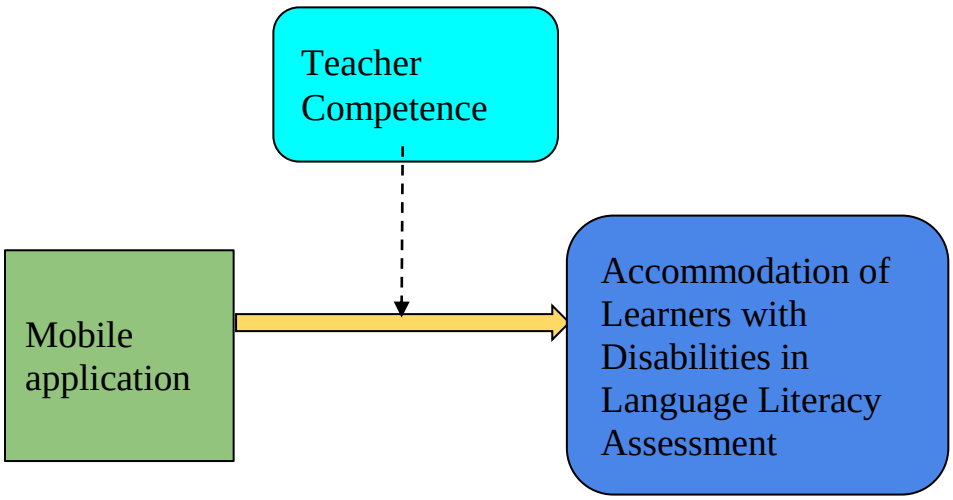
Table 4 shows that from the research report, there is generally a low level of accommodating learners with disabilities (Lehtomäki et al., 2014; Mapunda et al., 2017; Tungaraza, 2014; Thompson, 2017), a low level of using technology, and a small number of research on the use of technology to accommodate learners with disabilities. Findings from these studies imply the need for urgent action to improve the learning condition of learners with disabilities. They also suggest the need for research on the use of technology as a solution to challenges facing learners with disabilities. Therefore, it can be argued that the present study aligns with the need to fill the current practice and knowledge gap on the use of technology to accommodate learners with disabilities. This is because the present study aims at investigating ways through which mobile applications can be used to facilitate accommodation of learners with disabilities in summative language literacies' assessment, which apart from improving inclusive practices, will also add knowledge to the research world on the use of technology to accommodate learners in Tanzania education context.

CONCEPTUAL FRAMEWORK

Conceptual framework refers to the interrelationship of various concepts that emerged from the reviewed literature that represents a general mind map of the researcher on the studied problem (Leshem & Trafford, 2007). Based on the reviewed literature, it is clear that the teacher's competence determines the effective use of a mobile application to accommodate learners with disabilities in summative language literacies assessment. This conceptual framework can be

represented diagrammatically as in Figure 2. Therefore, this conceptual framework was used as the rubric for checking the preliminary requirements (presence of mobile applications and ability of the teacher to use technology) for teachers to be involved in implementing the use of mobile applications to facilitate accommodation of learners with disabilities.

Figure 2
Conceptual Framework for Mobile Applications in Accommodating Learners with Disabilities in Language Literacies Assessment



METHODOLOGY

STUDY AREA

The present study was conducted in one of the public primary schools in the Ilala district in Dar es Salaam. The school is located in a town with language literacies teachers posessing a minimum of six years of teaching experience and a Diploma as the minimum qualification. This school is among the schools in Tanzania which benefited from the Profuturo project. Profuturo's project supports the use of technology in primary schools by supplying digital tools such as tablets and laptops to facilitate access to technology for teachers and students. The provided gadgets are installed with the application known as Profuturo which offers various options to teachers such as uploading video text, creating tests, collecting survey data from students, and using ready-created resources for teaching and learning.

RESEARCH DESIGN AND APPROACH

In the present study, we adopted qualitative participatory action research. Our choice was driven by the need to gain an in-depth understanding of the assessment practices and solve related problems about the accommodation of learners with disabilities. It is evident from various studies that qualitative research design allows researchers to dig deeper into the experience of their participants in their actual contexts (Creswell et al., 2007). Moreover, participatory action

research promotes understanding of the problem from the perspective of the community rather than the researcher, which leads to sustainability of whatever proposed approach to solve such problems (James et al., 2008; Kemmis et al., 2014; Koshy, 2005). Therefore, we confidently believed that qualitative participatory action research could offer relevant insights for using mobile applications in accommodating learners with disabilities.

SAMPLE SIZE AND SAMPLING TECHNIQUES

Participants for the present study include one language literacies teacher and 10 Standard VII students who were selected through the purposive sampling technique. The purposive sampling technique involves a selection of participants based on specific criteria (Creswell et al., 2007; Hennink et al., 2011). The language literacies were selected because he was the one responsible for teaching language literacies in Standard VII. On the other hand, S5tandard VII students were chosen because they were the prospective candidates for summative assessment of language literacies. Moreover, the choice of criteria for students were extended to their performance based on the class teacher's knowledge of high, mid, and low performers were included in the sample size.

On the other hand, the collaborating teacher was selected based on his qualification (a Diploma holder) and experience (seven years) in teaching language literacies in Standard VI.

DATA COLLECTION METHODS

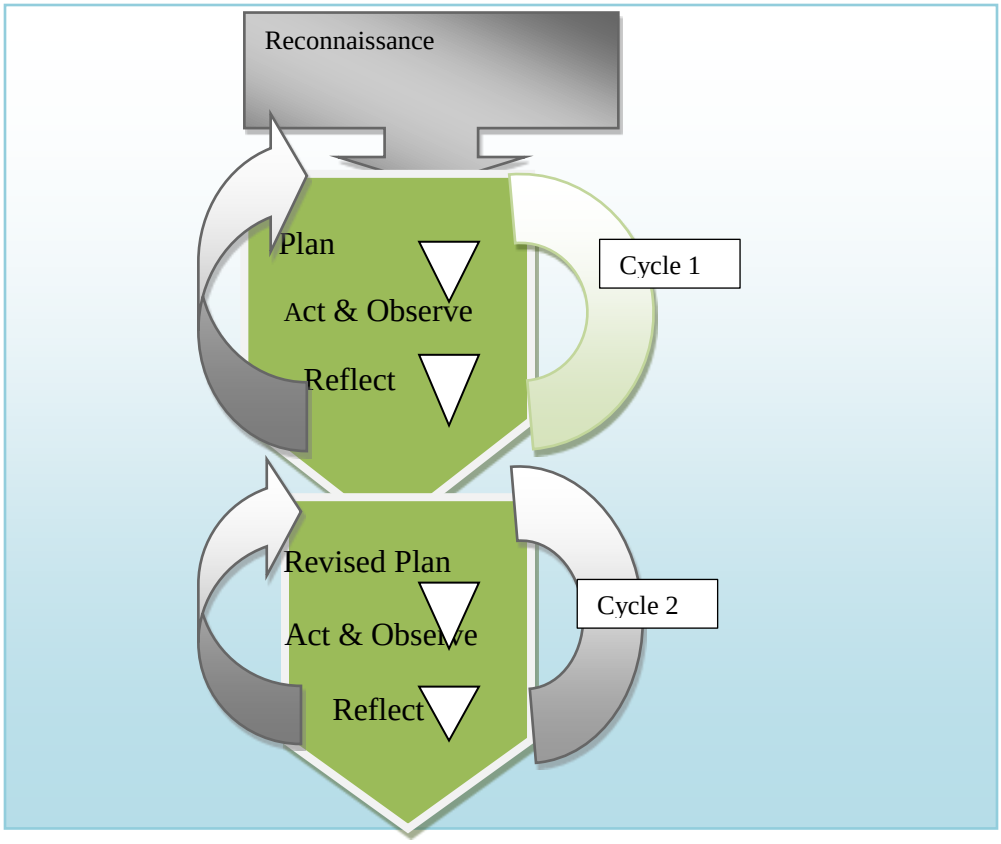
We collected data through interviews with the collaborating teacher; focus groups from students; observation from students and reflection from teachers, students, and ourselves.

In-depth interviews allow researchers to collect detailed information from the participants through probing (Hennink et al., 2011). Based on this, using interviews with the collaborating teacher helped us collect the required information. Besides, Focus Group Discussion (FGD) enables researchers to collect data from various perspectives (James et al., 2008; Koshy, 2005). This was a relevant tool for collecting data from 10 students whom we believed had different perspectives and hence employed. Koshy (2005) argues that observation methods provide fresh data to the researchers as they are collected at times of occurrence. Based on the need to focus on reflecting throughout the research process, we needed to observe students as they take assessments through the mobile application.

PARTICIPATORY ACTION RESEARCH PROCESS

We adopted the spiral model of the action research process as proposed by Kemmis and Mctaggart (1988) (Burns, 2009; Kemmis et al., 2014; Koshy, 2005). The model requires reiteration of the planning and implementation of the respective action as shown in Figure 3.

Figure 3
Spiral Model of Participatory Research Action



Note: Source: adapted from (Kemmis et al. 2014)

According to this model, participatory action research has to go through two phases. The first one is the reconnaissance phase where the research analyses the existing situation to collect data for planning the relevant action. The second one is the intervention/action phase in which the researcher implements his/her plan to deal with concerns observed from the reconnaissance phase. The intervention phase goes through various minor stages such as planning, implementation, and reflection. Although such minor stages seem linear, in actual sense, they are cyclic in the sense that there is the possibility of re-planning before implementation (Kemmis et al., 2014). The intervention phase could comprise multiple cycles depending on the various research circumstances such as achievement of the research goal or time constraints, to mention a few.

Consequently, such flexibility of the model provides potential room for improving the implementation process as a whole. Therefore, given the dynamicity of the classroom environment, such a model was deemed the best to cope with any emerging classroom challenge.

PHASES OF THE PARTICIPATORY ACTION RESEARCH

In the first phase, we conducted a situational analysis by interviewing the collaborating teacher and guiding focus group discussion with students. From this, we observed various concerns on current practices about accommodating learners with disabilities in language literacies assessment. Based on the reflection on the concerns noted by students and the teacher, we moved to plan for the intervention phase.

During the intervention phase, we collaborated with the collaborating teacher to analyse the potential mobile application for accommodating learners with disabilities in the assessment of language literacies. Having considered applications such as Zoom, Kahoot, Quiz, and Edmodo among others, we found Edmodo as the most useful one. However, finding that Profuturo could function similar to Edmodo, it has therefore became our best option since the students are already familiar with the application.

We collected texts from Youtube and Shutterstock based on the themes proposed in the curriculum. These texts included print text, audio text, and audio-visual text. Finally, we decided on questions to include in the assessment. Since the collaborating teacher was not conversant with using the computer, we as researchers designed the assessment (test) based on our consensus during the planning phase.

We implemented our plan by administering the test with the help of IT experts who supported us by connecting the local network for students to access the test on their tablets from the laptop where the test is stored. They also assisted us in troubleshooting network issues.

Having observed and reflected on the entire process, we noticed that there were three areas that we needed to improve. First, we noted that we were supposed to provide students with earphones to avoid noise during their attempt to listen to the questions. Second, the response space for listening questions was supposed to be created outside the space where we uploaded the video because the uploading space does not offer space for response. Third, there were question items that could be extended to assess multiple skills rather than a single skill as we once did. Therefore, the need to improve our action forced us to move to the second cycle of intervention which we implemented based on the lesson from the first cycle.

In the second cycle, we designed and administered the test while observing lessons from cycle 1. After the implementation of the action in this cycle 2, we evaluated the intervention process to see the degree to which we successfully achieved our goals. The evaluation of the intervention was done by collecting data through focus group discussions with students, interviews with the collaborating teacher, and reflection from students' reflection journals.

DATA ANALYSIS PROCEDURE

We adopted Miles and Huberman (1994)'s framework of analysing data thematically. The framework involves three key sets of activities namely data reduction, data display, and drawing conclusions and verification. Data reduction involves various activities such as coding, sorting, and even setting research questions through which data become manageable. On the other hand, data display is an act of compressing related data together through the matrix, charts, or graphs among others, through which one can easily lend to the relevant conclusions. Drawing conclusions and verification involves coming up with general statements about the data about both participants and theoretical views.

PRESENTATION OF FINDINGS

The present study aimed at investigating the contribution of mobile applications in accommodating learners with disabilities in the summative assessment of language literacies for Tanzania primary education. To achieve this, we analysed the current practices in accommodating learners with disabilities in the assessment of language literacies to understand major concerns. We also administered language literacies to determine the contribution and

challenges associated with the use of mobile applications for accommodating learners with disabilities. In this section, we present findings based on themes that originated from the specific objectives of the study.

CURRENT PRACTICES IN ACCOMMODATING LEARNERS WITH DISABILITIES IN SUMMATIVE ASSESSMENT OF LANGUAGE LITERACIES IN TANZANIA PRIMARY EDUCATION

Data indicate that current practices hardly reflect any form of accommodation for learners with disabilities. The presentation, response, and time allocation for the assessment are universal for all students. During the interview, the collaborating teacher reflected, "...here the assumption is that all students have the same ability so there is no consideration for specific groups unless a student exhibits some seriousness with his/her problem." (**Entrant Interview, 2 Sept. 2020)** This shows the extent to which learners are hardly accommodated in language literacies assessment.

It was also evident from the Focus Group Discussion (FGD) when one of the students said, ``There are students who fail the summative assessment because they cannot finish all questions or they have bad handwriting." **(Entrant FGD, 2 Sept. 2020)** It is clear from such statements that current practices are not flexible to accommodate the needs of various learners to facilitate them in demonstrating their potential.

FORMS OF ACCOMMODATIONS BROUGHT BY THE USE OF MOBILE APPLICATION

Data from the intervention phased show that the use of mobile applications facilitated various types of accommodation as shown in Table 5.

Table 5
Forms of Accommodation Brought by the Use of the Mobile Application

The type of Accommodation	Target Disabilities	Mobile application facilitation
Presentation	● Low vision ● Difficulty in reading ● Behavioural disorder.	● Allowed text zooming. ● Allowed each student to listen to the text at his or her preferable loudness. ● Allowed students to replay the listening text as much as they wished.
Response	Physical disability Behavioural disorder	● Standardized students' handwriting through typing with tablets' keyboard. ● Allowed students to

		rewrite their answers without dirtying their work. ● Motivated and sustained students' concentration through the use of multimodal texts.
Time	Behavioural disorders	● Allowed students to submit their work at their own pace. ● Online submission enabled others not to be worried about their low speed in attempting the test. ● Allowed flexible feedback.

CHALLENGES ASSOCIATED WITH USING MOBILE APPLICATIONS TO ACCOMMODATE LEARNERS WITH DISABILITIES IN LANGUAGE LITERACIES' ASSESSMENT

Data suggests that a lack of teachers' technological skills compromises the effective use of the mobile applications for accommodating learners with disabilities in language literacies assessment. From reflection, it was noted that the failure of the teacher to create space for a response to listening questions forced learners to respond using pen and paper. This interferes with the role of mobile applications to support learners with poor handwriting when responding to questions. In contrast, when the teacher revisited the application tutorial from the guideline menu, he was able to create the space in the second circle, which enable learners to respond to the listening questions by typing their responses in the spaces within the application.

DISCUSSION OF FINDINGS

The lack of accommodation of learners with disabilities in the current practices of summative language literacies assessment implies the low quality of inclusive education. This is because failure to accommodate learners with disabilities prevents them from demonstrating their learning potential. Such a lack of consideration for learners with disabilities could be attributed to poor education policies for learners with disabilities. Studies conducted in Tanzania show that the majority of teachers are not well trained to deal with learners with disabilities in their classroom contexts (Hofman & Kilimo, 2014; Tungaraza, 2014).

These findings are similar to that of Tungaraza (2014) who found low evidence of accommodation for learners with disabilities in Tanzanian inclusive education. Such similarities can be influenced by the continuous trend of not improving the teaching and learning environment of learners with disabilities in Tanzania.

On the other hand, Table 5 shows the use of mobile applications facilitates various forms of accommodation such as presentation, response, and time accommodation. This implies the potential of technology to facilitate the accommodation of learners with disabilities. These findings align with Ahmad (2015)'s position that technology can facilitate various forms of

accommodation to serve various groups of disabilities. These findings are similar to those from (Lin & Lin, 2016; Nordström, 2018; Stauter et al., 2019) who reveal that the use of technology facilitates learners with disabilities in improving their performance in assessments. Such similarities could be attributed to the similarities of technological tools used globally in the sense that they serve similar functions. Therefore, it is evident that technology has to be integrated into education to cater to various challenges including accommodation of learners with disabilities.
Moreover, the analysis showed that lack of skills among teachers is a major challenge in using mobile applications to facilitate accommodation of learners with disabilities in language literacies assessment. This implies the weakness of teacher education in preparing teachers to integrate technology in their classrooms. According to (Koehler & Mishra, 2009), teachers can successfully integrate technology in their classroom only if they are well prepared to use technology.

It can also be argued that a lack of skills among teachers is attributed to a lack of practicing the use of technology in the school context. With reference to the adage, 'practice makes perfect' it is possible that even teachers who graduated from their teacher education course with skills to use technology, lose their competence because they were unable to put the skills into practise. Based on this, a move towards integrating technology to support the accommodation of learners with disabilities should consider both teacher preparation education and classrooms where teachers apply the knowledge.

CONCLUSIONS AND RECOMMENDATIONS

The present study aimed at investigating the possibilities of using mobile applications to facilitate the accommodation of learners with disabilities in summative language literacies assessment. To achieve this, qualitative participatory action research was conducted at one of the public primary schools in Ilala district, in Dar es Salaam. Data were collected through interviews, reflection, observation, and Focus Group Discussion. Furthermore, thematic analysis was adopted. Findings show that current practices in summative assessment of language literacy hardly accommodate learners with disabilities. It was also observed that the use of mobile applications facilitates various forms of accommodation such as response, time, and presentation. Lack of skills among teachers was a major challenge associated with the use of the mobile application in accommodating learners with disabilities in language literacies. These findings are significant to the improvement of inclusive education in Tanzania primary schools as: first, they highlight the potential of mobile applications to accommodate learners with disabilities in language literacies assessment; second, it challenges teacher education to promote technological knowledge among teacher-students; and last, it provides a basis for best policy and practices for accommodating learners with disabilities in summative assessment.

Based on the findings, it is recommended that the National Examination Council in Tanzania (NECTA) should consider the use of technology in assessments to support learners with disabilities. Likewise, teacher education in Tanzania should consider the improvement of skills among teachers on how to integrate technology in the classroom contexts. Moreover, policymakers should come up with strategies to support schools' practices for accommodating learners with disabilities such as facilitating teacher professional development and access to technology among others.

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