



## **Tutors' Attitudes Towards Integration Of Adaptive Technology Devices For Visually Impaired Student Teachers In Primary Teacher Training Colleges In Kenya**

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### **Abstract**

Adaptive technology devices improve the quality of education and remove learning barriers for the Visually Impaired learners. This paper is a report of a study that assessed the tutors' attitudes towards integration of adaptive technology devices for Visually Impaired (VI) student teachers in the instructional process in primary Teacher Training Colleges (TTCs) in Kenya based on the diffusion of innovation theory by Rogers. The study adopted a Mixed Methods research approach. Descriptive statistics such as frequencies and percentages were used to analyze the quantitative data. This study revealed among other things that, tutor training on integration of adaptive technology was lacking, and the tutors viewed integration of adaptive technology as valuable but lacking. The paper recommended for provision of adequate adaptive technology devices for VI student teachers by the government, parents, communities and donors. Tutors should be sensitized and trained on the use of adaptive technology devices. The study sheds light on the challenges influencing the integration of adaptive technology in instruction for VI students.

**Key Words:** Adaptive technology devices, Visually Impaired students, technology integration, tutor attitudes

### **Introduction**

The goal of education is to provide equal opportunities for all persons including those with special needs (RoK, 2009). Kenya is one of the 92 nations of the world who originally signed the Salamanca statement and framework for action on special needs education (1994), where it was agreed that regular schools should admit all persons irrespective of their physical, social and mental conditions. This was in a bid to ensure that all accessed quality education. This is also echoed in the world declaration on Education For All in 1990 (UNESCO, 1990), the UN standard rules on the equalization for persons with disabilities in 1993 (UN, 1994) and the Dakar framework for action in 2000 (UNESCO, 2000). Millennium Development Goals endorsed at the UN millennium Development Summit in 2002 targeted the eradication of extreme poverty and hunger and the achievement of Universal Primary Education (UPE) as its first two goals. The education goals of the vision 2030 also consider this by providing globally competitive quality education, and among other things integrate special needs education into learning and training



institutions. Inclusive education is about both getting children into and through school by developing schools that are responsive to the actual, diverse needs of children and communities. Learners receiving special education have educational handicaps like physical, hearing, visual, mental, emotional, language, and multiple handicaps. These handicaps interfere with regular learning unless modifications and related services, equipments and specially trained teachers are provided (Republic of Kenya, 1999).

Students who are blind or visually impaired will typically need adaptations to access printed information that will allow the student to access all areas of the curriculum. According to Willings (2015), It is the role of the Teacher of Students with Visual Impairments to determine the adaptations that the student needs. Some of the adaptive technology devices include; Braille, tactile maps and diagrams, print with the use of optical devices and screen readers among others. Categories of adaptive technology include: academic and learning aids , computer access and instruction; pre-vocational and vocational and vocational aids, and visual aids.

Adaptive technology devices improve access to quality education, enable the learner to address individual and collective temporary social problems and be able to reach responsible judgment in seeking solutions to these problems. They enhance the performance of a target skill, including cognitive processes, learning, communication, and physical abilities. Adaptive technology therefore improves the functionability of learners (Republic of South Africa, 2005).

According to the national policy for persons with disabilities in Kenya, the government would facilitate the production and availability of quality, appropriate and affordable adaptive equipment and assistive devices. Retraining of teachers in regular schools would be scaled up to enable them teach children with special needs. There would be a conducive learning environment that takes care of special needs of children with disabilities in collaboration with stakeholders. Appropriate technologies, assistive devices and learning materials for persons with disabilities would be designed and developed. Special needs education in the regular teacher- training curriculum would be incorporated (RoK, 2015).

The gap in research encompasses the tutors' attitudes towards integration of adaptive technology for visually impaired student teachers in instruction. This study attempted to bridge this gap by assessing the tutors' attitudes towards integration of adaptive technology for visually impaired student teachers in instruction in primary TTCs.

### **Statement of the Problem**

A dominant problem for the visually impaired is lack of access to education. This is due to inadequate capacity among many teachers to handle students with special needs, lack of coordinators among service providers, inadequate and expensive teaching/ learning materials among others (MOEST, 2005). In order to increase access and improve on quality, the Kenya government has integrated special education programmes in pre-service teacher training in three primary teachers training colleges, which was the focus in this study with regard to integration of adaptive technology for visually impaired (VI) student teachers in instruction.

For the VI student teachers to graduate as skilled, confident and competent primary school teachers, tutors should modify and adjust materials of learning so that they can access the



curriculum content adequately. The VI student teachers have been admitted in selected primary TTCs in Kenya and have been placed in the same classes with the sighted student teachers. They are taught by the same tutors at the same time in the same class yet they use different learning materials.

An adapted syllabus for VI student teachers has been prepared to cater for their needs. The syllabus stresses that the teaching of student teachers who are visually impaired demands that tutors should possess positive attitudes towards teaching student teachers who are visually impaired. Though a study by Tabot (2017) revealed that teacher trainers have a positive attitude towards the integration of special needs education in the PTE curriculum, the tutors' attitudes towards integration of adaptive technology for visually impaired student teachers in instruction in primary TTCs is not evident. Inclusive Education has been introduced in primary TTCs and thus there is need for research in the area to ascertain the state of affairs. Evidence is necessary because without use of adaptive technology, visually impaired student teachers will not be adequately prepared as primary school teachers. It is against this backdrop that the study was carried out on the tutors' attitudes towards integration of adaptive technology for visually impaired student teachers in instruction in primary TTCs.

### **Research Objective**

The objective of this study was to examine the tutors' attitudes towards integration of adaptive technology for visually impaired student teachers in instruction in primary TTCs.

### **Literature review**

According to the adapted syllabus for the VI student teachers, tutors are expected to have positive attitudes to student teachers who are visually impaired (KIE, 2005). This has also been stated by other researchers. Attitudes formation is influenced by perception with regard to a particular object or action (Serem, 2008). Cope and Ward (2002) in a research on teacher perceptions on the integration of learning technology in the classroom concluded that teacher perceptions of learning technologies are likely to be key factors in the successful integration of learning technologies. Attitude refers to 'a psychological tendency that is expressed by evaluating a particular entity with some favour or disfavors'. There is a link between attitude and one's evaluation of a given object or state of being. Visually impaired students have the internal self-construct, which makes them have a certain psychological tendency of what other peoples' attitude is towards their state of being visually impaired. (Eagly, & Chaiken, 1993). Teachers' attitudes toward inclusion is critical in implementing the goal of inclusive schools and availability of support and perceived competence are important factors. Without the correct attitudes in the regular classrooms, inclusion of pupils in regular classroom becomes impossible (Zindi, 2004).

Teacher education is pivotal in developing the affirmative attitudes and skills required for successful inclusion. Bortoli (2011) asserts that the high level of education and training in special education resulted in a more positive attitude in teachers toward inclusion. Positive attitude towards inclusion of disabled students is one of the requirements of the success of Inclusive Education. Not only is the positive attitude of the teacher important, but the positive trend of the society towards inclusion of disabled people is necessary to achieve the desired success and the aim of Inclusive Education. The teacher is the most influential person in the process of education therefore when the attitudes and perceptions of the teacher need changing, the process needs to



begin early in the process at the foundation of skill development. Formal educational training and inclusion of a compulsory module on diversity in a post-graduate degree have been identified as factors that promote an inclusive attitude. According to Mataruse (2002), the teacher's type of training influences his/her attitude towards children with disabilities. The attitude of specially trained teachers is more positive to special class /unit placement than that of teachers without specialist training. The success of inclusive education depends on teachers' attitudes. This implies that for inclusion to be successful then teachers need to be trained on integration of adaptive technology.

According to Agbenyega (2006), teachers who feel unprepared and fearful to work with learners with disabilities in regular classes, display; frustration, anger and negative attitude towards inclusive education due to the belief that it could lead to lower academic standards. Access to resources and specialist support affects teacher confidence and attitudes toward inclusive education for students with disabilities. Teachers develop and establish various attitudes towards their students, which have a significant effect on their educational attainment. Students' academic performance was negatively affected by the teachers' attitudes during learning processes. Teachers' lack of confidence due to poor conceptual and phenomenological subject foundations may negatively influence academic performance (Barros, & Ellia, 2000). The willingness of teachers is also a prerequisite for successful implementation (Pijl, & Van Den Bos 2001, p. 113).

Therefore, teachers need the self-confidence to carry out their duties in demanding unique situations. Peoples attitude tend to evolve as they become more familiar with change. Studies by researchers (Floyd, Smith, Canter, Jeffs, & Judge, 2008) indicate that in order for teachers to use adaptive technology in a manner that brings forth a strong, positive impact, they must be confident and well-trained to do so. According to (Sharmila et al., 2015), attitudes are conceptualized as constructs comprising cognitive, affective and behavioral components.

They also influence professional practice, and thus are crucial factors in the implementation of new technologies (Haney, & Lumpe, 1995). Further, teachers' attitudes towards a certain strategy affects their efficiency in teaching (Wanjala, 2005). Kennedy and Deshler (2010) opine that many teachers often reject new tools that may not easily fit within their current approaches to teaching and learning while technology is rapidly changing and evolving. If technology in inclusive classrooms is to be optimized, Teachers should be informed of technological advances for instruction. Teacher training fosters positive attitudes toward Inclusive Education practices. Many teachers are willing to receive training to improve their knowledge and skills, in order to help children with special needs (Rakap, & Kaczmarek, 2010). With regard to the perception of teachers, Korir (2015) in a focused group discussion found out that, the teachers' initial perception about students with visual impairment and the program was negative and full of prejudices. After interacting with the visually impaired students, most of the sighted students and their teachers found them to be like any other students. They were as brilliant as the sighted students were. Because of this mixing the visually impaired students with the sighted ones has improved the public image about visually impaired children in the society.

Tutors in primary TTCs need to have positive attitudes towards the teaching of VI student teachers, which was the focus for this study. To implement technology successfully in their



classroom, teachers must develop positive attitudes and feel comfortable using them as instructional tools (Rakes, & Casey, 2002). Teachers consider that educational technologies can enhance the learning experience of students in the special education classroom. Teacher training session can modestly improve regular and special education teachers and administrators' knowledge on special education (Woodbury, 2015; Maida, 2015).

According to Tabot (2017) and Nyoni (2011), general education teachers should have both appropriate skills and attitudes in order to adequately and meaningfully assist students with visual impairments in general education settings. Teachers should be trained to implement various strategies to facilitate students' assimilation into the classroom, school, community and work setting. Experts contend that students with visual impairments need instruction by a teacher with expertise in the areas of visual disorders, and sufficient training in effective use of strategies. This is because the visually impaired student not only required to master the same educational curriculum as their peers, but also the Expanded Core Curriculum (ECC) if they are to be successful (Hatlen, 2000).

According to Tuimur (2017) and Jones (2017), lack of teacher training is a barrier for students because of inadequate skills. The teachers are not aware of how to properly accommodate and modify the assignments in classroom so that the students have access to curriculum and environment. This has an effect on how much the teacher can provide support in the classroom. The lack of support provided by teachers seemed to have a lasting effect on students.

### **Methodology**

This study adopted a mixed method strategy where both quantitative and qualitative approaches are used to test different methods of inquiry for their effectiveness in achieving the intended goal. The research design was descriptive survey. The study was carried out in three primary teachers training colleges in Kenya where VI student teachers had been integrated. The target population consisted of tutors in primary TTCs in Kenya with visually impaired student teachers making a total of 210. The sample for the study was drawn from the tutors in primary TTCs in Kenya which admitted VI student teachers. Simple random sampling was used to select 93 tutors.

The instrument used for data collection in this study was a questionnaire. The researcher developed a questionnaire which was used to get information from tutors in primary TTCs on the tutors' attitudes towards integration of adaptive technology for visually impaired student teachers in instruction in primary TTCs. The researcher visited the three primary TTCs and in each college administered the questionnaire personally to the tutors. This gave the researcher a chance to explain the importance of the study and why it was being conducted. A total of 93 questionnaires were distributed to the selected primary teachers training colleges and all were returned. This gave a return-rate of 100%.

Once developed, the questionnaires, were seen by the teaching staff of Moi University; Department of Curriculum, Instruction and Educational Media where corrections were made, suggestions and advice were used as a basis in modifying the research instruments and making them adequate to the study. This ascertained the content and construct validity of the instruments as per the suggestion by Fraenkel and Wallen (2003). The researcher also sent out the



questionnaires for pilot testing in one of the institutions with VI student teachers that was not involved in this study. The researcher subjected them to Cronbach coefficient alpha and found 0.80 coefficient thus the questionnaire was taken to be reliable and fit for use in the study since (Boudah, 2011) stresses that researchers use measures that have a reliability coefficient of 0.80 or better.

## Results

An adapted syllabus for VI student teachers has been prepared to cater for their needs. The syllabus stresses that the teaching of student teachers who are visually impaired demands that tutors possess positive attitudes towards teaching student teachers who are visually impaired. Teacher attitudes and beliefs are powerful forces which significantly influence actions in the classroom. They also influence professional practice, and thus are crucial factors in the implementation of new technologies Scardamalia and Bereiter, (2003) and (Haney, & Lumpe, 1995).

The study sought to find out from the college tutors their attitude towards the integration of adaptive technology for VI student teachers in primary TTC's. They were required to tick the alternative that best expressed the extent of their agreement to the statements. The results are shown in Table 1

**Tutors Attitude towards Integration of Adaptive Technology for VI Student Teachers in Primary TTCs**

Statement	SA		A		UN		D		SD		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
Adaptive technology is valuable when teaching	64	68.8	21	22.6	4	4.3	2	2.2	2	2.2	93	100
Adaptive technology is easy to integrate in instruction of VIS	18	19.4	39	41.9	14	15.1	17	18.3	5	5.4	93	100
Adaptive technology enhances VI student teachers understanding	56	60.2	33	35.5	3	3.2	1	1.1	0	0.0	93	100
Adaptive technology is a motivator of VI student teachers	54	58.1	33	35.5	4	4.3	2	2.2	0	0.0	93	100
I recommend tutors to be trained on integration of ATD	73	78.5	16	17.2	3	3.2	1	1.1	0	0.0	93	100
Teaching VI student teachers using ATD too demanding	13	14.0	26	28.0	25	26.9	17	18.3	12	12.9	93	100



I feel uncomfortable teaching VI student teachers using ATD 10 10.8 20 21.5 26 28.0 19 20.4 18 19.4 93 100

I am confident using ATD when teaching VI student teachers 14 15.1 24 25.8 25 26.9 15 16.1 15 16.1 93 100

Special education teachers are better placed to use ATD 34 36.6 37 39.8 4 4.3 11 11.8 7 7.5 93 100

I recommend that teaching VIS teachers using ATD to be optional 4 4.3 11 11.8 16 17.2 26 28.0 35 37.6 93 100

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The respondents strongly agreed that they felt that adaptive technology was valuable when teaching VI student teachers and that a positive attitude was necessary in enhancing integration of adaptive technology for VI Student teachers in primary TTC's. This is in agreement with the adapted syllabus for the VI student teachers where tutors are expected to have positive attitudes to students who are visually impaired (KIE, 2005). This has also been stated by other researchers that attitude formation is influenced by perception with regard to a particular object or action (Serem, 2008). The also agreed that adaptive technology enhances VI student teacher's understanding of the subject content and most of them agreed that tutors should be trained on the integration of adaptive technology for VI student teachers.

They saw the need for use of adaptive technology for visually impaired student teachers but were not confident due to their incompetence. This may be because they lacked skills in preparation of tactile diagrams and had no knowledge on English Braille. As earlier noted from the theoretical framework, perceived attributes of innovations affected its adoption, Rogers (2003). This implies that the tutors had positive attitudes towards integration of adaptive technology for visually impaired during instruction. But their integration was low since they lacked expertise. Rogers (2003) explains that one of the perceived attributes which influences innovation is complexity. This is the degree to which an innovation is perceived as relatively difficult to understand and used. If the innovation is perceived to be difficult then it is avoided. This may explain the attitudes of tutors who had no confidence in the use of adaptive technology since they lacked expertise.

With regard to the perception of teachers, Korir (2015) in a focused group discussion found out that, the teachers' initial perception about students with visual impairment and the program was negative and full of prejudices. After interacting with the visually impaired students, most of the sighted students and their teachers found them to be like any other students. They were as brilliant as the sighted students were. Because of this mixing the visually impaired students with the sighted ones has improved the public image about visually impaired children in the society.



They appreciated the role of adaptive technology devices in enhancing understanding of the subject content. The heads of departments and Deans of Curriculum from the interviews felt that adaptive technology was valuable when teaching VI student teachers since instruction became effective; the students became independent when looking for information. They further added that adaptive technology made the VI student teachers easily understand concepts and be in touch with what was being taught. A lot of effort has to be put into the inclusive education process since mere familiarity with blind persons does not in itself improve attitudes. The school has to evolve through establishing and adhering to policies, which teachers, administrative staff and students have to uphold. Inclusion fosters the integration of students with disabilities into their parent societies earlier in life and ensures equal opportunities for all students to use resources available in the school and the community, if all ideal resources were put together for the benefit of all students.

The teachers' attitude towards a teaching strategy affects his efficiency in teaching (Wanjala, 2005). Without the correct attitudes in the regular classrooms, inclusion of pupils in regular classroom becomes impossible (Zindi, 2004). Teacher education is pivotal in developing the affirmative attitudes and skills required for successful inclusion. Bortoli (2011) asserts that the high level of education and training in special education resulted in a more positive attitude in teachers toward inclusion. According to Mataruse (2002), the teacher's type of training influences his/her attitude towards children with disabilities. The attitude of specially trained teachers is more positive to special class /unit placement than that of teachers without specialist training. The success of inclusive education depends on teachers' attitudes. This implies that for inclusion to be successful then teachers need to be trained on integration of adaptive technology.

According to Korir (2015), the teachers' perception towards the integrated program, whether positive or negative, was of crucial concern since the teachers formed the immediate company for the students with visual impairment in a school environment. Teachers felt that the students with visual impairment had been made to suffer more by being brought in a regular program. This was because there was little commitment from the government through the ministry of education to boost the students with visual impairment. The teachers said that there were no trained teaching staff, no special fund, teaching and learning facilities. According to Chireshe (2011), long-serving teachers in programmes related to counselling sometimes suffered from burnout and had more negative attitudes towards those programmes than new teachers. Similarly, familiarity with blind students may not necessarily produce positive attitudes towards them in inclusive schools. The most important way of translating of policies into practice always was to reallocate resources for staff training and mass procurement of material resources. It was also necessary to move on to the identification of learners who could be serviced from their least restrictive environments.

Greater integration of the visually impaired into classes with seeing children and more training about the capabilities of the visually impaired for regular classroom teachers would result in improved attitudes towards the visually impaired and more appropriate educational planning and placement (Berdin, & Blackhurst, 1985, p.257). Tuimur (2011) and Chemwei (2013) stress that; a positive attitude towards innovation generally leads to adoption. Once familiar with the adaptive technology devices and confident in their use, teachers are able to see its application within the curriculum (Bitter, & Legacy, 2009). A teacher should be able to update knowledge



on a regular basis to keep pace with the new trends in the profession (Agumba et al., 2009, p.154).

According to Gary (1997), Agbenyega (2006), Haralambos and Holborn, (2008) and Yara, (2009), teachers who feel unprepared and fearful to work with learners with disabilities in regular classes, display; frustration, anger and negative attitude towards inclusive education due to the belief that it could lead to lower academic standards. If technology in inclusive classrooms is to be optimized, Teachers should be informed of technological advances for instruction. Teacher training fosters positive attitudes toward Inclusive Education practices. Many teachers are willing to receive training to improve their knowledge and skills, in order to help children with special needs (Rakap, & Kaczmarek, 2010). According to (Sharmila et al., 2015), attitudes are conceptualized as constructs comprising cognitive, affective and behavioral components. Teachers' attitudes towards inclusion are often based on practical concerns about how inclusive education can be implemented, rather than be grounded in any particular ideology.

## Conclusions

The Tutors' attitude towards integration of adaptive technology for VI student teachers in primary TTC's was positive. They acknowledged the value of adaptive technology.

## Recommendations

The MOEST should develop in-service courses to train the tutors on the use of Braille and preparation of tactile diagrams so as to effectively teach VI Student teachers in primary TTCs since it is charged with the responsibility.

The primary TTC tutors should be exposed to ways of integrating adaptive technology during instruction of visually impaired student teachers so as to confidently teach and have positive attitudes.

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