JOURNAL OF EDUCATION FOR SUSTAINABLE INNOVATION | ISSN 3025-1052
Vol. 3, No. 2, 2025, 137-146
https://doi.org/10.56916/jesi.v3i2.2625

Promoting science teachers' competencies in Tanzania: The significance of competence-based assessment approaches

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Keywords
Competence-based assessment
Significance
promotion
science teachers' competencies.

Article History
Received 2025-10-13
Accepted 2025-12-30

Abstract
This study examined how competence-based assessment approaches can promote the development of science teachers'competencies in diploma teacher colleges in Tanzania. The study used a multiple case study research design. Qualitative methods such as interviews, focus group discussions, documentary reviews and observations were employed, and data from 66 respondents were analyzed using thematic analysis. The findings indicated that the majority of science tutors still employed a traditional assessment approach, with traditional paper-and-pen assessments remaining dominant and few competence-based assessments, such as projects and practical work, being incorporated into science lessons in diploma teacher colleges. The minimal use of competence-based assessment approaches was due to a lack of skills, limited administrative support, a lack of, or delay to, teaching and learning materials, heavy teaching workloads, large class, and inflexibility. The study recommends the use of competence-based assessment approaches, the provision of in-door training, and the timely purchase of teaching and learning materials.

INTRODUCTION

The advancement of science and technology worldwide highlights the importance of competent science teachers who can meet the demands of various fields (Mgaiwa, 2018). In teaching and learning process, assessment is one of the most vital aspects. This is because an assessment provides a landmark to understand what both tutors and student teachers have achieved, what have not been achieved, and the way forward (Mkimbili & Kayima, 2022). Competence-based assessment plays a crucial role in improving the quality and effectiveness of science teachers by equipping them with the necessary skills to teach science subjects effectively (Ngao, 2020). Similarly, they represent the knowledge, skills and attitudes necessary for personal fulfilment and development, active citizenship, social inclusion and employment (Juma, 2024). The system is beneficial as it enables educators to understand what student teachers are learning in the classroom and how they can perform at their best (Lwidiko & Maliganya, 2024). Understanding existing assessment practices and how they align

with competence-based principles is essential to promoting science teachers' competencies in an educational context (Kangalawe, 2019). The competency-based assessment approach in diploma teacher colleges focuses on evaluating student teachers' mastery of the specific skills, knowledge and abilities relevant to real-world situations.

Teachers' competencies are developed by a number of factors, including the use of a competence-based approach to teaching and learning science (Kingwilu & Mokoro, 2022). Research indicates that the key to unlocking students' academic success lies in having skilled science educators (Hagenimana, Ntamiha, Tabaro & Buhigiro, 2023). Teachers are responsible for ensuring effective teaching and learning in order to achieve positive learning outcomes. The challenge lies in finding ways to assess outcomes that cannot be measured by performance tests alone (pen and paper test only), given that these only offer a limited view of what learners experience in the classroom (Mwakyobwe & Shawa, 2023).

However, a problem in developing countries, including Tanzania, is the lack of knowledge and skills regarding how to select and use competence-based assessment approaches during teaching and learning (Lwidiko & Maliganya, 2024). The exploration of competence-based assessment approaches in science lessons is a matter of concern. The majority of studies have focused on pedagogical approaches, paying less attention to assessment approaches.For instance, Cheruiyot (2018) conducted a study about teacher factors that influence the choice of teaching methods used by early childhood development education teachers in Keiyo South district Africa. Also, Rahman, Tambi & Anny (2020) conducted a study about the importance of enhancing pedagogical skills through continuing professional development. Moreover, Tacconi & Perini (2020) did a study on development of pedagogical competencies of the vicational teachers in Italy and Lithuania implications of competence-based vet curriculum just to mention a few. Thus, they have overlooked the specific challenges faced by science tutors at diploma teacher colleges in the Iringa, Dodoma, Tabora and Tanga regions with regard to selecting and using competence-based assessment approaches. This study aims to address this gap by examining the use of competence-based assessment approaches in science lessons to promote the teaching competencies of science teachers. It is important to consider these changing aspects in order to inform policymakers, curriculum developers and other educational stakeholders, with the ultimate goal of enhancing support for science teachers and improving educational outcomes in Tanzania.

Objective

The following objective guided the study: To examine how competence-based assessment approaches can promote science teachers' competencies for teaching science.

Social Constructivist Theory

The study adopted a social constructivist theory, which emphasises the active involvement of learners in the construction of knowledge through interaction with others within their environment (Akpan, Ijeoma & Okoro, 2020). Similarly, the theory recommends the presence of assessment approaches that give learners the opportunity to actively engage in the creation of knowledge in order to develop their competencies (Fosnot, 2013). Thus, the study focuses on examining the use of competence-based assessment approaches, such as project work, practical work and portfolios, in science lessons. These approaches encourage science teachers to interact with each other and with their tutors, thereby promoting the development of competencies in learners.

METHODS

Research Approach and Design

This study adopted a qualitative approach to assess how competence-based assessment approaches were employed to develop science teachers' competencies for teaching science. The participants' views were obtained in natural social settings using this approach. Conferring to

Creswell (2013) a qualitative study examines how people make sense of an issue in a natural social setting. Similarly, during data collection, the study employed a multiple case study research design, using methods such as interviews, focus group discussions, observations and documentary reviews to gain a comprehensive understanding of the use of competence-based assessment approaches in promoting science teachers' competencies for teaching science.

Participants

The study comprised four college principals, four academic deans, four college internal quality assurers, sixteen science tutors and fifty-six science student teachers, totalling sixty-six participants. They were selected purposively to provide information on the use of competence-based assessment approaches in promoting science teachers' competencies for teaching science.

Research Instruments

The interview guide was used to collect data from college principals, the academic dean, internal quality assurers and science tutors regarding the use of competence-based assessment approaches to promote science teachers' competencies for teaching science. Additionally, focus group discussions were employed with science teachers to gather their views, and a non-participant observation guide sheet was used with both science tutors and science teachers during science lessons to observe teaching and learning activities. Furthermore, various academic documents, such as schemes of work and lesson plans, were reviewed to gain a detailed understanding of the use of competence-based assessment approaches in promoting science teachers' competencies for teaching science.

Data analysis procedure

The study adopted a thematic approach to analyze the data collected from interviews and focus group discussions. Five key stages were applied: transcription; coding; categorization into themes; a detailed description; and interpretation in relation to the research questions. To further elaborate the findings, reviewed documents and classroom observations were also used. This comprehensive data analysis procedure enabled the researchers to systematically examine the data collected on the use of competence-based assessment approaches to promote science teachers' competencies for teaching science, identify related themes and draw meaningful conclusions that addressed the research questions.

Trustworthiness

The study findings must be credible, dependable, confirmable and transferable to guarantee them (Amkwaah, 2016). The study established credibility through prolonged engagement in the field during the collection of data, in order to obtain essential information on the employment of competence-based assessment approaches in the development of science teachers' competencies for teaching science. In this study, credibility was established by using the member check technique to review the data collection tools and the collected data during the development of the research proposal, to ensure that the findings would deliver what the study projected. Dependability was guaranteed by documenting the research methods employed during data collection, as well as consulting the supervisor and other research experts during the development of the research proposal

and instruments to obtain the necessary information on the use of competence-based assessment approaches in developing science teachers' competencies for teaching science. The study kept detailed notes of the procedures used during data collection and analysis to ensure confirmability. Transferability was achieved by providing a description of the context, location, people studied, and the study problem to inform readers about the employment of competence-based assessment approaches in developing science teachers' competencies for teaching science.

Ethical Considerations

The study adhered to five ethical responsibilities: voluntary participation of the respondents; a research permit; avoiding harm and bias towards the respondents; confidentiality; and conducting the research anonymously (Punch, 2009). Concerning ethical considerations, the study provided a brief explanation of its purpose and value to society, as well as to educational sectors and stakeholders. The researcher also asked participants if they were willing to take part in the study and stated that the study would not be biased. Furthermore, the study guaranteed the confidentiality of the information provided by respondents, using it only where required. Similarly, the researcher labelled the selected diploma teacher colleges with letters and assigned numbers to participants. Additionally, the study requested a research permit from the Vice-Chancellor of the University of Dodoma.

RESULTS

The study examined the use of competence-based assessment in science lessons to promote the teaching competencies of science teachers in diploma teacher colleges in Tanzania. One research objective guided the study, and the results are therefore presented in reference to this objective.

The use of competence-based assessment approaches in science lessons

Qualitative data was collected from college principals, academic deans, college internal quality assurers, science tutors and science student teachers in diploma teacher colleges regarding the use of competence-based assessment approaches in science lessons to promote science teachers' competencies. This revealed key issues such as awareness of competence-based assessment approaches, practices relating to the selection and use of these approaches in science lessons, and administrative support for their use in teaching and learning science subjects.

Competence based assessment approaches' awareness in diploma teacher colleges

The study examined participants' awareness of competence-based assessment approaches in diploma teacher colleges, and how this awareness influences the implementation of such approaches in science lessons. Interviews with participants showed that awareness of competence-based assessment approaches is low in diploma teacher colleges; thus, few science tutors are fully aware of these approaches, and the majority have only a partial understanding. Furthermore, awareness of these approaches differs from one science tutor to another within a college, as well as from one college to another. Participants argued that an understanding of these approaches motivates them to use these strategies in their teaching, encouraging science student teachers to engage actively in teaching and learning activities, which in turn enhances the development of their competencies. On this topic, one science tutor said:

In my view, understanding the various competence-based assessment approaches recommended in the teachers' education curriculum, such as projects and practical works, is one of the steps towards developing the competencies of science student teachers. The little knowledge I have of these approaches encourages me to select and use those that best support the development of my

physics student teachers' competencies during their learning (Interview with science tutor, college A, 2024)

In addition, another science tutor put it another way:

I am aware of a few competence-based assessment approaches, such as field trips, portfolios, practical work and group assignments, as recommended by the teachers' education curriculum. I don't feel confident using other assessment approaches simply because I don't know how to use them to assess my chemistry student teachers. I usually give my chemistry student teachers tests and examinations, with a few practical tasks, when I'm assessing them (Interview with science tutor, college D, 2024)

Moreover, a particular academic dean provided an illustration of this:

I monitor the assessment practices given to student teachers through classroom observations and by collecting curriculum documents such as schemes of work, lesson plans and tests and examinations. I also check that the assessment tools reflect the learners' level and measure the intended competencies required to ensure quality. During my monitoring, I noticed that most science tutors use tests and examinations to assess their students; few of them use approaches such as projects, practical work and portfolios. When I asked some science tutors about this after classroom observations, they claimed that they were not aware of these approaches and were therefore reluctant to use them when assessing their student teachers (interview with academic dean, college B, 2024).

Furthermore, the minimal use of competence-based assessment approaches in science lessons observed in this study was due to the findings on awareness of these approaches, which revealed that some tutors never use them in their science teaching due to a lack of awareness. Illustrating this phenomenon, one of the science tutors testified:

To be honest, most of us would like to use competence-based assessment approaches in our lessons, but we lack the necessary skills. For example, although I am familiar with a few such approaches, I have not used them effectively in my biology lessons. Firstly, this is due to my lack of adequate skills. Secondly, the large number of student teachers in my class, coupled with inadequate teaching and learning materials, makes it challenging to implement these approaches effectively. (Interview with science tutor, College B, 2024).

Responses from science tutors and academic deans indicated the limited use of competence-based assessment approaches in science lessons at diploma-level teacher training colleges. They further elaborated that, despite the importance of competence-based assessment approaches in enhancing science teachers' competencies for teaching science subjects, few science tutors were aware of these approaches. Furthermore, the focus group discussions (FGDs) supported the responses given by the science tutors, showing that approaches such as project work, practical work, portfolios, field trips and group assignments contribute to memory retention, enhance critical thinking and develop competencies in student teachers by enabling them to apply classroom learning to real-life situations though most science tutors are reluctant to change the way they assess their student teachers, they mostly use written assessments as the standard approach in diploma teacher training colleges.

The practice of selecting and using competence-based assessment for science subjects.

Data collected from college principals, academic deans, internal quality assurers, science tutors and student science teachers on the practice of selecting and using competence-based approaches indicated that its use is limited. Few science tutors use competence-based assessment approaches. This may be due to inadequate competencies among science tutors or other factors, such as a large number of student teachers in a class, rigidity, lack of awareness, heavy teaching workloads or inadequate teaching and learning resources. One science tutor said:

I face difficulties in using competence-based assessment approaches in my teaching due to my heavy teaching workload, the large number of chemistry student teachers and the inadequate teaching and learning materials available. In our unit, there are few of us and the number of student teachers enrolled in chemistry is too high, to resolve this situation I mostly give them pen-and-paper assessments, as I find it easier to follow up on these than on projects and practical works, which require more time and my full engagement. In addition, my awareness of assessment approaches is inadequate, which affects the way I assess my chemistry student teachers. In fact, providing project works, portfolios, practical and group work assignments develop student teachers' competencies, as it enables them to actively engage in learning science subjects (Interview with science tutor, College A, 2024).

Moreover, one of the internal quality-assurers commented on this perspective from their own standpoint.:

As an internal quality assurer, I follow up on the entire teaching and learning process, including checking that the assessment approaches employed are learner-centred and involve student teachers in activities that develop their competencies. Through classroom observations, I have noticed that most science tutors use tests and examinations as their assessment approach, i.e. pen-and-paper assessments. When I questioned them, some said that inadequate skills, a large number of student teachers, and a heavy teaching workload forced them to use assessments such as quizzes, tests, and examinations, which assess memorization rather than performance (Interview with college internal quality assure, College C, 2024).

Responses from science tutors and internal quality assurers regarding the use of competence-based assessment approaches in science lessons indicated that this is at a minimal level. In line with this, responses from focus group discussions (FGDs) conducted in diploma teacher colleges revealed that few science tutors who teach chemistry and biology provide their student teachers with assignments that require them to perform activities while studying science subjects, such as preparing teaching aids, especially during BTP preparation, and projects for continuous assessments, as well as learning how to prepare and use chemicals during practical sessions.

Administrative endorsement of competence based assessment approaches in science lessons

The study findings indicate the extent to which administrators endorse the use of competence-based assessment approaches in the teaching and learning of science subjects in diploma teacher training colleges. Based on the views of the participants regarding administrative endorsement of the selection and use of competence-based assessment approaches in science lessons, the findings revealed that support is limited. One of the science tutors argued as follows:

To be honest, I would say that, I receive limited support from the principal and academic dean, particularly when requesting teaching and learning materials such as specimens, apparatus, chemicals, models and manila folders. This prevents me from using assessment approaches that involve my students learning by doing to acquire the intended competencies. There is also a lack of in-house training, particularly on how to select competence-based assessment approaches and how to construct test items that develop the scientific competencies of student teachers (Interview with science tutor, College B, 2024).

In addition, based on this viewpoint one of the college principals declared:

I moderately support the teaching and learning of science, particularly the assessment part, in my college. This involves purchasing essential equipment and chemicals when needed, so that science tutors can teach and assess in a way that is recommended by the curriculum and so that their student teachers can learn well. However, the demand for science teaching and learning far exceeds the

funding we receive from the government, which is why I only partially support science tutors, particularly in the assessment stage of teaching science subjects at my college. (Interview with Principal, College C, 2024).

Responses from the majority of science tutors and college principals indicated that administrative support for competence-based assessment approaches that enhance science teachers' skills is limited in diploma teacher colleges in Tanzania. Furthermore, some academic deans and college internal quality assurers reported minimal administrative support for science tutors using these approaches. This support was inadequate in the form of insufficient teaching and learning materials for science teaching, as well as a lack of in-house training sessions for science tutors. They also stated that effectively selecting and using competence-based assessment approaches in science lessons enhances science teachers' competencies.

In response to the above, all college principals in diploma colleges reported that they slightly support the use of competence-based assessment approaches in science teaching and learning at standard level, but they face difficulties when it comes to purchasing teaching and learning materials and conducting indoor training in colleges. Thus, inadequate funding and limited budgets mean they are unable to meet the needs of their staff.

DISCUSSION

The study examined the use of competence-based assessment approaches to enhance the competencies of science teachers in diploma teacher colleges in Tanzania. Based on three key factors (awareness of competence-based assessment approaches, practice in using them in science lessons, and administrative endorsement), the findings revealed that most science tutors have only a basic understanding of competence-based assessment approaches. The study also found that the majority of science tutors still employed traditional assessment approaches such as pen-and-paper tests, while a few incorporated competence-based assessments such as projects and practical work into science lessons in diploma teacher colleges. Furthermore, the minimal use of competence-based assessment approaches was due to a lack of awareness and skills, limited administrative support, delays to or a lack of teaching and learning materials, heavy teaching workloads, large number of student teachers in a class and inflexibility.

This result relates to the findings of Juma (2024) who conducted a study about competence based assessment in Tanzania teacher education in the fourth industrial revolution, also to the study conducted by Lwidiko and Maliganya (2024) who conducted a study on the literature review on competence based assessment in Tanzania primary and secondary schools: The current situation, challenges and future directions, also to the study of Kingwilu and Mokoro (2022) about teacher assessment practices in implementing competence based curriculum in secondary schools in Arumeru District of Tanzania and Mwakyobwe and Shawa (2023) about pedagogical and assessment practices towards competency based education in Tanzania teacher colleges

In affiliated to other studies, this study findings indicated that majority of science tutors were ready to use competence based assessment approaches but only few of them were using competence based assessment approaches such as projects, potifolio and practical works in assessing their student teacher. Thus, science tutors' use of competence based assessment approaches in teaching and learning of science subjects was limited in diploma teacher colleges in Tanzania. The limited level of using competence based assessment approaches was due to inadequate awareness and skills, large number of student teachers in the class, inadequate and dealying of teaching and learning materials, heavy teaching work load, inflexibilty and limited administrative support. In support of these findings

the study done by Hagenimana, Ntamiha, Tabaro and Buhigiro (2023) about competence based assessment strategies applied by teacher in english subject, also the study conducted by Mwakyobwe and Shawa (2023) about pedagogical and assessment practices towards competency based education in Tanzania teacher colleges. In addition, the study done by Lwidiko and Maliganya (2024) about the literature review on competence based assessment in Tanzania primary and secondary schools, the current situation, challenges and future directions, and the study of Kingwilu and Mokoro (2022) about teacher assessment practices in implementing competence based curriculum in secondary schools in Arumeru District of Tanzania their results support the results of this study.

Generally, the assumption here is that, all the recognized matters cause science tutors lost confidence and interest in using the competence based assessment approaches in science lessons, thus negatively affected the development of science teachers' competencies. On these perspectives, the study conducted by Mwakyobwe and Shawa (2023) about pedagogical and assessment practices towards competency based education in Tanzania teacher colleges and study of Moshi (2015) about the role of competence based assessment practices in enhancing learning in secondary schools support this. The responses from participants in this study that addressed the question of what are challenges that face the teaching and learning of science subjects revealed that, inadequate skills to some science tutors on how to select and use assessment approaches which are competent based, inadequate teaching and learning materials, delaying of teaching and learning materials and inadequate skills on how to use them, large number of student-teachers enrolled in college with respect to science tutors employed were the challenges.

Furthermore the limited administrative support and inflexibility of science tutors in the ways of assessing their student teachers also were among the challenges that limit effective teaching and learning of science subjects in diploma teacher colleges in Tanzania including assessment practices. This result findings relate to results found in study comnducted with Mwakyobwe and Shawa (2023) about pedagogical and assessment practices towards competency based education in Tanzania teacher colleges and study of Mgaiwa (2018) about emerging fundamental issues of teacher education in Tanzania: a reflection of practices.

The responses from participants about suggestion to improve teaching and learning of science subjects in diploma teacher colleges revealed that an increase of hands-on activities such as practical and project works to reflect the development of science teachers' competencies as one of the factors that will improve teaching and learning of science. The findings also showed that, conduction of several in-service training, presence of improved curriculum, modification of some science topics so as to measure the intended competencies, presence of teaching and learning materials such as chemicals, apparatuses, teaching models, manual guides, specimens, text books, projectors and computers on time and enrolment of science student-teachers based on the college available resources will improve teaching and learning of science subjects the study findings relay with Hagenimana, Ntamiha, Tabaro and Buhigiro (2023) about competence based assessment strategies applied by teacher in english subject.

The findings, however, advocate that college principals reported delaying of funds and inadequate budget for teaching and learning resources and conduction of in-service training on selection and use of competence based assessment approaches. Due to this, the government of Tanzania should ensure that diploma teacher colleges are either provided with teaching and learning resources or assigned with sufficient budgets on time the study findings communicate with the findings obtained from a study of Mwakyobwe and Shawa (2023) about pedagogical and assessment practices towards competency based education in Tanzania teacher colleges.

CONCLUSION

The analysis of the study findings indicates that awareness of competence-based assessment approaches is minimal in diploma teacher colleges. Thus, few science tutors are fully aware of these approaches, and the majority are only partially aware. Additionally, awareness differs from one science tutor to another within a college, as well as from one college to another. This limited awareness of competence-based assessment approaches restricts science tutors' use of learner-centred strategies in their teaching. The findings also indicate that few science tutors employed competence-based assessment approaches in their teaching. This was due to inadequate skills in selecting and using competence-based assessment approaches in science lessons, inadequate and delayed teaching and learning materials, an inadequate budget and delayed funds, limited administrative support, a large number of student teachers in classes, heavy teaching workloads, and inflexibility in assessing science subjects. From these observations, the study concludes that, despite science tutors' readiness to use competence-based assessment approaches in science lessons, their implementation in the classroom remains insignificant. Therefore, student teachers are likely to remain incompetent in science subjects.

Furthermore, the study findings reveal that securing the support of administrators for the effective implementation of competence-based assessment approaches in diploma colleges remains challenging. The unfavourable results regarding the employment of competence-based assessment approaches in science lessons in diploma teacher colleges trigger recommendations for science tutors to educate themselves and focus on using assessment approaches that develop science teachers' competencies, such as practical work, project work, portfolios and peer group assignments, rather than the traditional pen-and-paper assessment approach, which mostly measures memorisation. Similarly, the college management team must be innovative enough to generate income through projects that would support the college in covering some costs, such as organising seminars and in-house training to develop the skills of science tutors, and purchasing teaching and learning materials to enable the implementation of competence-based assessment approaches in science lessons. Similarly, the government must ensure the availability of education projects that provide adequate funding for education sectors and institutions, which will help to run diploma teacher colleges, including the construction of ventilated classrooms with electricity and well-equipped science laboratories to support the teaching and learning of science subjects.

In general, the study concludes that, although science tutors are willing to use competence-based assessment approaches in lessons, these approaches remain irrelevant in the classroom. Consequently, student teachers are likely to remain incompetent in science subjects. The study recommends using competence-based assessment approaches, providing in-house training and purchasing teaching and learning materials in a timely manner.

ACKNOWLEDGMENT

The current study is partly based on data collected for a PhD study conducted in the Iringa, Dodoma, Tabora and Tanga regions of Tanzania in 2024. Special thanks are given to my supervisors at the University of Dodoma and the Government of Tanzania for enabling me to undertake this PhD research. Thanks are also due to the grammar and spelling checker DeepL Translate, ChatGPT, and the respondents who voluntarily provided data to complement this study.

REFERENCES

Akpan, Ijeoma & Okoro. (2020). Learning constructivism implications on teaching and learning.

Amkwaah. (2016). Creating protocals for trustworthiness in sualitative research. *Journal of Cultural Diversity*.

Creswell. (2013). Educational reserch, planning, conducting and evaluating quantitative nad qualitative reserch.University of Nebraska-Lincoln.

Fosnot. (2013). Costructivism: Theory, Persiperctives and Practice (2nd ed.,P.8) New York: Teachers College Press.

Hagenimana, Ntamiha, Tabaro & Buhigiro. (2023). Competence- based assessment strategies applied by teacher in English subject.

Juma. (2024). Competence based assessment in Tanzania teacher education in the fourth industrial revolution.

Kangalawe. (2019). Assessment used to measure practical skills in competence based curriculum in secondary schools in Temeke district Tanzania. *Duke Law Journal*.

Kingwilu & Mokoro. (2022). Teacher assessment practices in implementing competence based curriculum in secondary schools in Arumeru district of Tanzania.

Lwidiko & Maliganya. (2024). The literature reiview on competence based assessment in Tanzania primary and secondary schools: The current situation, challenges and future directions.

Mgaiwa. (2018). Emerging fundamental issues of teacher education in Tanzania: A reflection of practices. *International Journal*.

Mkimbili & Kayima. (2022). Preparing secondary school science teachres for learner- centered teaching in Tanzania' training colleges: educators perceived challenges and perspectives.

Mwakyobwe & Shawa. (2023). Pedagogical and assessment practices towards competency based education in Tanzania teacher colleges.

Ngao. (2020). Teacher education in Tanzania: pre service teachers preparation for the 21st century.

Punch. (2009). Introduction to researchmethods in education.London, Sage publication Ltd.