

Exploring Perceptions of Authentic Assessment among Undergraduate Science Students in Tanzania: Implications for Competency Acquisition

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Abstract

This study investigated the perceptions of undergraduate science students in Tanzania regarding authentic assessment and its influence on competency acquisition. The study employed a qualitative research approach. It comprised 6 undergraduate science students from 2 higher education institutions in Tanzania. Data were collected using semi-structured interviews and thematically analyzed. Qualitative analysis of interviews discussions explored students' experiences, attitudes, and recommendations regarding authentic assessment practices. Benefits from authentic assessment were therefore evident as it created engagement, contextualized understandings, and learning through the development of skills. Challenges included pressure of time and lack of clarity on assessment criteria. Recommendations to improve such challenges included provision of clearly articulated guidelines and rubrics, opportunities for formative feedback, and integration of authentic assessment within the curriculum. The findings bear on practices and policies in education supporting a shift to congruence between assessment practices and learning objectives, as well as providing opportunities for instituting supports for authentic assessment to be carried out. With these challenges in hand, educators and policymakers may together create an authentic and impactful learning environment to equip undergraduate science students with necessary competencies for their future development.

Keywords: authentic assessment, competency acquisition, perceptions, science education, undergraduate students

1.0 Introduction

In the world of education, the study of how assessment techniques deal with the students and help students' learners become competent remains an area of interest (Fialho et al., 2023; Rao & Banerjee, 2023; Yüksel & Gündüz, 2017). Within this discussion, the issue of authentic assessment has come as a boost in the efforts to improve the academic performance of undergraduate science students (Sewagegn & Diale, 2020; Sokhanvar et al., 2021). Authentic assessment consists of implementing tasks associated with real-life challenges which necessitate the generation of ideas and technical expertise, and has attracted public interest due to its

promise in improving understanding and the ability to carry out tasks (McArthur, 2022; Villarroel et al., 2018; Vu & Dall'Alba, 2014).

Tanzania as an emerging nation making strides to develop the educational system and its outcomes needs to ascertain the contribution of the authentic assessment on the acquisition of competency of undergraduate science students. Gaining an insight into this context where students' response to authentic assessment in the first place is key to informing practices and approaches in education and educational systems designed to achieve competency based education goals (Quansah & Asamoah, 2019).

The study sought to investigate how undergraduate science students in Tanzania perceive authentic assessment and its effects on the acquisition of competencies. An exploration of the students' views was used to identify the strengths and limitations of assessment practices that would inform recommendations for improvements and add to the ongoing discourse on quality enhancement in sciences education, based on these disciplines.

2.0 Literature Review

Authentic assessment and its role in the competency acquisition of undergraduate science students represent the view of theory and practice related to such pedagogical strategies (Darling Hammond and Snyder, 2000; McArthur, 2022; Villarroel et al., 2018). The review of existing research landscape-focusing on this student perception study in Tanzania and which identifies the different gaps for future research-is to be embedded in this study.

Herrington et al. (2006) suggest that authentic assessment finds its firm basis in constructivist learning theories, which emphasize the need to consider student abilities in the use of knowledge and skills in real-life situations. Besides, traditional assessment seems to be largely memory-based expositions and, in their editions, fail to cultivate efforts toward critical independence of mind as Bogdan and Biklen had suggested. Authentic assessment prioritizes higher-order thinking, problem-solving abilities, and critical reasoning, aligning assessments more closely with the complexities of professional practice (Vu & Dall'Alba, 2014).

Research across various educational settings has highlighted the numerous benefits associated with authentic assessment. Studies indicate that this approach not only deepens students' understanding of subject matter but also enhances motivation and engagement, while fostering the development of transferable workplace competencies that are crucial for success in professional environments (Karunanayaka & Naidu, 2021; McArthur, 2022; Villarroel et al., 2018).

Within the domain of science education, authentic assessment has great potential in developing competence required for scientific inquiry and professional practice; that is why authentic assessment engages students in tasks related to scientific practice that can further develop skills related to experimental design, data analysis, and communication. The theoretical base of authentic assessment is firmly grounded, but empirical research regarding its practice and influence in undergraduate science education in Tanzania is scarce. Few studies exist on the perception and effectiveness of authentic assessment among students for the acquisition of competencies within the Tanzanian undergraduate science context.

Given the unique sociocultural and educational context of Tanzania, where competency-based education is increasingly emphasized as a means to prepare students for the demands of the 21st - century workforce (URT, 2000, 2014), there is a compelling need to explore how undergraduate science students perceive authentic assessment and its alignment with their learning goals and aspirations.

3.0 Materials and Methods

3.1 Research Approach and Design

This study used a qualitative research approach to explore undergraduate science students' perceptions of authentic assessment and its relationship to competency acquisition in Tanzania. Qualitative research is well-suited for investigating complex phenomena such as students' attitudes and beliefs, allowing for an in-depth exploration of their experiences and perspectives (Johnson & Christensen, 2014; Lodico et al., 2010). It focuses on understanding phenomena by examining how things occur (Johnson & Christensen, 2014).

3.2 Participants

The participants in this study were undergraduate science students enrolled in the two universities in Tanzania. A purposive sampling technique was employed to ensure representation from diverse academic disciplines within the sciences. Six (6) students were purposely sampled for the study. Three (3) students from each institution were purposively selected depending on the areas of specialization namely Biology, Chemistry and Education. Purposive sampling is used when the goal is to select cases that are likely to be information rich with respect to the purpose of the study (Gall et al., 2003). With regard to purposive sampling, the sample might be a single case for the sake of developing deeper understanding of phenomenon (Gall et al., 2003).

3.3 Data Collection Methods

Data were collected through semi-structured interviews. Semi-structured interviews provided an opportunity for individual participants to express their thoughts, feelings, and experiences related to authentic assessment and competency acquisition. The method was audio-recorded and transcribed verbatim for analysis.

3.4 Data Analysis and Ethical Considerations

Thematic analysis was employed to analyze the qualitative data collected from interviews. This iterative process involves familiarization with the data, generating initial codes, identifying themes, reviewing themes, defining and naming themes, and producing the final report. The analysis was conducted manually to ensure close engagement with the data and the emergence of nuanced insights.

Ethical approval was obtained from relevant Institutions namely the University of Dodoma and Mkwawa University College of Education prior to data collection. Informed consent was obtained from all participants, and confidentiality and anonymity were maintained throughout the research process. Participants had the right to withdraw from the study at any time.

4.0 Findings

The findings from this study inform the views of Tanzanian undergraduate science students about authentic assessment via an independent lens on competency performance. From this analysis of the interviews, several themes arose that shed light on students' experiences with assessment practices, as well as their attitudes and suggestions for improvement.

4.1 Knowledge of Authentic Assessment

The understanding levels of authentic assessment by the participants varied. Some students associated authentic assessment with real-world application and problem-solving; others understood it as simply another form of internally-based assessment. For example, using the example of one undergraduate science-teacher, the following was his reflection on authentic assessment:

..... Authentic assessment is the form of assessment that differs from tests and examinations. Here students are not required to write rather they are engaged in actual performance of the tasks. So, I think authentic assessment is the type of assessment focused on competencies development (Student 1, November 2021).

From the response of a student, it is obvious that had certain understanding of authentic assessment contrary to traditional paper-and-pencil tests. The perception of authentic assessment was the one that is learner-centred and focusing on performance.

4.2 Subjective Benefits of Authentic Assessment

Almost all participants realized a number of benefits related to authentic assessment. List of factors enhanced engagement with course material by providing deeper understanding of concepts and transferable skills such as critical thinking, problem solving and ability to communicate effectively.

Students stated they preferred authentic assessment compared to traditional approaches as this is something in their future career and practice. One undergraduate science-teacher, for instance, said:

I think they do help for example in seminar presentation we give them questions and they need to have a skill like team work because they need to work together to communicate messages in front of the class. Can enhance problem solving skills because are given tasks and should come up with solution- so it also enhances problem solving skills. When they do projects, they have to come up with the way of thinking, they acquire higher level of thinking. I think portfolio has something to do with organizational skills, communication, and collaboration because sometime they do as a group rather than individual. (Student 5, November 2021).

Another student said:

We tend to work in groups, given practical manual, then we study such manuals. We are asked questions based on the given manuals. So practical works are done by using manuals. The benefits we acquire from the conduction of practical work is acquisition of competencies such as communication skills, collaboration, teamwork, and organizational skills. (Student 2, November 2021).

4.3 Glimmers of a Downside

While the rewards seemed compelling, students raised some challenges and concerns with authentic assessment. Issues emerged in several areas: timing and workload of authentic assessment tasks, lack of clarity regarding assessment standards, and concerns about the validity or reliability of scoring. Participants at the outset expressed some frustrations about uncertainty, particularly because of how predictably specifiable by society via tradition in contrast with authentic assessment. A Participant supporting the point on challenges said:

Resources are scarce, we are more than 500 students, so in carrying practical is challenging as instructor has to work hard to accommodate that.” He kept on insisting despite the challenges, however, authentic assessment tools are very relevant to competence acquisition because if we are told to prepare scheme of work, or lesson plan in portfolio that is what we tend to do.” (Student 3, November 2021).

Similarly, another participant had the following comment;

I believe authentic assessment to be useful compared to traditional assessment paper and pen test. But their challenges involved such as taking too long time to accomplish tasks such as projects and practical work. It also needs commitment to accomplish the given tasks so given several courses to study; authentic assessment is challenging to engage with. (Student 4, November 2021).

From the quotation it implies the use of authentic assessment is positively perceived by students despite the challenges that might affect the full implementation. Students perceive authentic assessment to be useful in the process of leaning as are equipped with the competencies in the working world.

4.4 Suggestions for Improvement

Several suggestions were also made by participants to enhance the use of authentic assessments in undergraduate science education. It aimed to (a) ensure that all students understood how they were performing in the various course components, and (b) introduce numerous features that provided opportunities for formative feedback and encouraged self-assessment as elements of good quality learning: clear guidelines and rubrics for assessment tasks an increased emphasis on peer-learning within the curriculum authentic assessment integrated across the curriculum. A need for developing faculty capacity to design and implement authentic assessment tasks was also noted by students.

The results of this study further suggest that authentic assessment has the potential to nurture desirable competencies and skills acquisition objectives among Tanzanian undergraduate science students. Although students understand the importance of authentic assessment, they do have some complaints or concerns for it.

5.0 Discussion

The findings of this study have shed light on the perceptions of undergraduate science students in Tanzania towards authentic assessment and the implication it has on acquiring competencies. In light of these findings, the following discussion zooms in on the major themes that emerged and what they portend for educational practice, policy, and future research. The participants in this study proved that, indeed, authentic assessment is understood at deeper levels with most, seeing a positive effect on learning outcomes and transferable skill development. The variations in attitudes of students might mean that there is a need for clearer communication and alignment between the assessment tasks and the objectives of the course. Educators should argue out the reason for and criteria under which authentic assessment is performed to ensure that students see its meaningfulness and relevance to their learning goals.

The perceived advantages of authentic assessment in terms of increased engagement, better understanding of concepts and skills, created a good relationship with previous research findings (Gulikers et al., 2006; Sokhanvar et al., 2021; Villarroel et al., 2018). Previous research also relates positively to these findings, it was found that authentic assessment helps promote autonomy and acquisition competence for the learner (Holisah & Umam, 2021; Mardjuki, 2018; Mudau, 2022; Schultz et al., 2022). They also noted that authentic assessment is sometimes very time-consuming, with gray assessment criteria, and depending on the individual who grades it. The current findings of this study thus reveal the need to address logistical and pedagogical issues in the implementation of authentic assessment practices. Converging with prior work from Alfiani and Hermilia (2022) and Aziz et al. (2020) on factors constraining authentic assessment implementation.

The participants' recommendations for the improvement of authentic assessment practices can be synthesized with best practices noted in the literature by Linn et al. (2015) and Villarroel et al. (2020). That is providing clear guidelines and rubrics, creating space for formative feedback and self-assessment, and integrating authentic assessment throughout the curriculum are key strategies that would increase the level of authenticity and effectiveness of assessment practices. More so, support from the institution in terms of resources, infrastructure, and faculty development initiatives is also important for making authentic assessment work. While this study provides valuable insights into students' perceptions of authentic assessment in Tanzania, further research is needed to ascertain the learning outcomes and effectiveness of such assessments in fostering competency acquisition longitudinally.

Moreover, cross-disciplinary researches and studies on the different fields and educational institutions would help in the development of a more comprehensive understanding of each of the reasons that affect the feelings and perception of students about authentic assessment. Also, examination of the influence of authentic assessment on students' life-long learning outcomes and professional achievements will result in contributions to the discussions on educational quality and science education innovations. In so doing we complement the literature that is increasingly becoming available on the use of authentic assessments and the way it packages the students' experiences in the Tanzanian e-learning context. This will be done by following the procedures that will be given in relation to the application of the strategies and the problems that have been proved. This is an approach that could be followed by educators and policymakers with a view to making the teaching and learning of science more authentic and impactful by equipping undergraduate science students with the competencies that they will require for their future careers.

6.0 Conclusions

The present study has successfully shed light on the views of undergraduate students studying in Tanzanian contexts concerning authentic assessment in relation to competency acquisition. In-depth interviews have also been coded, analyzed, interpreted, and incorporated within the text and several themes have been developed as a result of such analysis which depicts the rich

texture of experiences and views of the students. It is noticed that while some effort is made in defining the authentic assessment but some students go further than that. Educators must be sure that assessment tasks are well explained if the course intends to develop competencies in students. There are however, also other problems that students encounter, such as the issue of workloads and vague instructions on how their work will be assessed. Countering these problems largely depends on the institution in question and the resources, support and training that are available in terms of engaging in authentic assessment practices.

7.0 Recommendations

It is recommended that the university instructors could provide clear guidelines and rubrics, and offering formative feedback opportunities to students. Likewise, the University management could ensure to integrate authentic assessment throughout the curriculum. It is also recommended for continued research and collaboration among university instructors for advancing understanding of authentic assessment and its implications for competency acquisition.

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