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Authentic Assessment Tools: Implication to Enhancement of Learning among Undergraduate Science Student-Teachers

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ABSTRACT

Summative use of authentic assessment tools in universities is dominant despite its ineffectiveness in enhancing learning. The paper investigated the summative use of authentic assessment tools in enhancing learning among undergraduate science student-teachers in Tanzanian universities. It employed a mixed-method research approach with an explanatory sequential research design. The target population for the study was 650 undergraduate science student-teachers and 20 university instructors from two selected universities in Tanzania. The sample involved 231 undergraduate science student-teachers and six instructors selected by proportional stratified random sampling and purposive sampling procedures respectively. The questionnaires and semi-structured interview methods were used to collect data. Findings indicated the dominant use of authentic assessment tools on a summative basis. For instance, portfolios, practical work, and projects were found to be dominantly used on a summative basis while teaching practice was found to be minimally used on a summative basis. Furthermore, it was found that summative use of authentic assessment tools was dominant in some education courses and less dominant or not used at all in some science courses. It is concluded that the summative use of authentic assessment tools should not be emphasized if universities are to enhance learning among undergraduate science student-teachers.

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1. INTRODUCTION

Summative use of authentic assessment tools is considered to be ineffective in enhancing learning among students (Broadbent *et al*., 2018; Houston & Thompson, 2017; Rawlusyk, 2018). The use of authentic assessment tools on a summative basis makes learners anxious in the process of learning when exposed or preparing for the task. Likewise, it affects the process of learning by putting pressure on students hence affecting the acquisition of competencies. It leads to extrinsic motivation since students are engaged in tasks due to either grading or promotion accompanied by the assessment task. Furthermore, it promotes a surface learning approach that focuses on rote learning and memorization. Summative use of authentic assessment tools in universities has been noticed to be dominant despite its ineffectiveness in enhancing learning among students. The dominant use of authentic assessment is due to its use in certifying, promoting learning and accountability to the educational stakeholders such as students, teachers, and academic institutions. That being the case summative use of authentic assessment has been given priority because most universities use authentic assessment tools for grading, certifying learners, and accountability of instructors at large.

Several studies have been conducted on the summative use of authentic assessment tools in universities (Broadbent *et al*., 2018; Hilden *et al*., 2022; Houston & Thompson, 2017; Ishaq *et al*., 2020; Yüksel & Gündüz, 2017). On the one hand, they indicate the use of authentic assessment tools on a summative basis for the sake of measuring students' achievements (Broadbent *et al*., 2018; Houston & Thompson, 2017; Rawlusyk, 2018). On the other hand, they indicate the summative use of authentic assessment tools for accountability and certification of instructors and students respectively (Hilden *et al*., 2022; Ishaq *et al*., 2020).

However, little has been presented on the extent of the summative use of authentic assessment tools such as portfolios, projects, practical work, teaching practice, or fieldwork based on students' and instructors' opinions. The study intended to contribute to the pool of knowledge by indicating the extent of using authentic assessment tools on a summative basis and its implication for the enhancement of learning among students. If the extent of summative use is revealed it is possible to come up with responses to the criticisms of university graduates on inadequacy of competencies. The key research question was: to what extent are authentic assessment tools used on a summative basis towards enhancing learning among the undergraduate science student-teachers in universities in Tanzania?

2. CHARACTERISTICS OF AUTHENTIC ASSESSMENT

Authentic assessment is defined as an assessment that demonstrates competencies that will be used in future workplaces and involves using critical thinking or problem-solving skills (Schultz *et al*., 2022). It involves the following characteristics.

2.1. The Context of Authentic Assessment

It should be realistic by sampling the actual knowledge, skills, and dispositions used in the professional world (Darling-Hammond & Snyder, 2000). It involves realism which is concerned with everyday life and work (Villarroel *et al*., 2018). Realism means the tasks in authentic assessment should reflect the actual situation in the world of work by focusing on the tasks done by professionals. Authentic assessment considers fidelity to the environment by presenting tasks that confront undergraduate science students with activities carried out in professional practice (Gulikers *et al*., 2004). Furthermore, assessment should be located in the world of work context that undergraduate prospective science teachers will inhabit on

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graduation. This means that authentic assessment inculcates the competencies required in the field of specialization in a student.

2.2. The Outcome Should be in the Form of a Performance

The authentic assessment focuses on the knowledge, skills, and attitude that a student can demonstrate as the result of the learning process. Authentic assessment involves activities that are performance-based replicating the tasks and performance related to teaching professionalism in the world of work. The skills and knowledge acquired by undergraduate science students should be demonstrated by performance leading to the production of a completed product (Ashford-Rowe *et al*., 2014). It is often based on performance, requiring students to utilize their knowledge in a meaningful context (Oladele, 2011). It is further concerned with the mastery of individual undergraduate science students in performing the tasks related to the real world of the teaching profession. This means that learners are actively engaged in performing the tasks as they learn. Through active engagement and performance; learners are likely to acquire the professional competencies of concern. Furthermore, Nguyen Thi Thu and Vu Dinh (2021) comment that authentic assessment involves learners in performing tasks and creating products through performance. It is the assessment that calls for performance among the learners in that they are actively engaged in tasks through performance.

2.3. Ensures Transfer of Knowledge

Authentic assessment ensures the transfer of learning beyond the classroom in that the acquired competencies are used in daily life in the world of work. The knowledge learned in one area can be applied to other, often unrelated areas (Ashford-Rowe *et al*., 2014). This process of using the learned competencies in other areas calls for the understanding of the subject matter. Likewise, the process leads to the use of the learned knowledge beyond the classroom to other areas in the world of the profession. This means that authentic assessment involves understanding the learned materials concerning their use beyond schooling. It is a form of assessment that engages learners in the real world of work by using what was acquired in the Higher Education Institution setting. It links higher education and the industrial world or world of employment through the application of learned competencies (Quansah *et al*., 2019). Authentic tasks call students to demonstrate what they learned through application in real-world settings. Authentic tasks make learners develop high-order thinking skills needed in their professional future careers (James & Casidy, 2018).

2.4. Involves Collaboration

Authentic assessment involves tasks done by students through creating group problem-solving situations that enable them to share ideas by seeing the value of what they are learning (Ashford-Rowe *et al*., 2014). The point that the concept is really important in an authentic assessment is that the collaboration in the social processes of the assessment resembles the social processes in an equivalent situation in reality (Gulikers *et al*., 2004). This means if the social processes involve collaboration in the professional world of work, the tasks should call for the same. Authentic assessment emphasizes tasks that involve students working together in groups rather than in isolation as most of the social activities beyond the classroom are socially oriented (Gulikers *et al*., 2004; Ridwan *et al*., 2021). Furthermore, Herrington *et al*. (2006) comment on the characteristic of authentic assessment by indicating that it provides the opportunity to collaborate within a course and the real world but also an opportunity to reflect. The social processes of an authentic assessment must resemble those

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of a professional context. This includes involving students in collaboration and problem-solving. There are two aspects of social context: the system gathered by the learner from his/her culture, and social interaction with more knowledgeable members of the community.

2.5. Involves Multiple Indicators of Quality

It considers different performances in assessing an individual student based on criterion-based standards (Tanner, 2001). It also considers a full array of tasks and multiple indicators of learning to come to fair conclusions (Darling-Hammond & Snyder, 2000; Tanner, 2001). Multiple sources of evidence to cover adequate samples of thinking and behavior are needed to support decisions on competencies acquisition (Darling-Hammond & Snyder, 2000). Undergraduate science students should neither be assessed by a single task nor be judged based on a single performance as an indicator of competence acquisition (Gulikers *et al*., 2004).

2.6. Involves Criteria and Standards in Judgment

Authentic assessment involves setting criteria and making them explicit and transparent to learners beforehand, hence guiding the learning process (Gulikers *et al*., 2004). Scoring criteria must be transparent and be shared explicitly with students to facilitate their learning; the use of rubrics is recommended. Authentic assessment involves the use of a rubric score which specifies criteria on how tasks may be assessed. Gallardo (2020) describes rubrics as assessment guides for grading and giving feedback to learners while demonstrating acquired competencies. Likewise, Villarroel *et al*. (2018) criteria indicate by specifying the performance and standards to be demonstrated by learners. As learners are made aware of criteria; they are likely to internalize and by so doing enhance the acquisition of competencies.

3. METHODS

3.1. Methodological Considerations

3.1.1. Research approach and design

The study employed a mixed-method research approach with an explanatory sequential research design. The mixed method research approach provides a better understanding of the research problem than either quantitative or qualitative by itself. An explanatory sequential design was used because the concern was to describe the use of authentic assessment tools on a summative basis and the reasons for such use. Quantitative data provided frequencies indicating the use of authentic assessment on a summative basis while qualitative data provided reasons for such summative use.

3.1.2. Sampling of the participants

The sample for this study was drawn from third-year undergraduate science student-teachers pursuing Bachelor of Science with Education Degree programs from 2 Universities. The study participants were selected through proportional stratified random sampling to involve both males and females. A total of 231 undergraduate science student-teachers were selected as a sample from both universities as indicated in **Table 1**.

Table 1. Demographic characteristics of the students (n= 231).

Institution	Gender	Frequency	Total
A	Males	60	120
	Females	60	
B	Males	56	111
	Females	56	

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3.2. Methods of Data Collection

This study employed questionnaires and interviews as data collection methods.

3.2.1. Questionnaires

The questionnaire was used for data collection from undergraduate science student-teachers. Closed-ended questions in the form of a Likert scale were used to solicit information regarding the use of authentic assessment. The questionnaires aimed to obtain information from the undergraduate science students' teachers' opinions on the summative use of authentic assessment tools concerning competencies. Questionnaires, however, have the tendency to yield a low rate of return if mailed or posted. It was important, therefore, to ensure that they were administered personally.

3.2.2. Interviews

A semi-structured interview was used to collect data on the use of authentic assessment for three instructors and six undergraduate science-student-teachers. An interview was used to get a detailed explanation of how authentic assessment tools were used in universities. However, interviews have some weaknesses such as time consuming, open to interviewer bias hence hard to achieve objectivity, and interviewee fatigue. These weaknesses were addressed in this study by good planning in terms of time in that appointment was made earlier with respondents to avoid time wastage and taking so long for the interview session.

3.3. Data Analysis and Ethical Considerations

Data were analyzed by using descriptive statistics for quantitative data and thematic analysis for qualitative data. All ethical concerns were observed to ensure that participants in the study were to take part freely. Before giving them the questionnaires, they had to consent to fill them out. It was also important to inform them about the objective of the study and to ensure the confidentiality of the data they gave. Participants were ensured that no one could be identified by his/her name and that the data collected would be for research purposes only. Plagiarism of ideas was to a greater extent avoided and all the materials used in this study were listed in the reference list and placed in the text.

4. RESULTS AND DISCUSSION

4.1. Findings

The findings of the study indicate the summative use of authentic assessment tools based on the Likert scale which ranged from strongly agree to strongly disagree on the statements given. The respondents were required through a questionnaire to indicate based on the degree of agreement how the authentic assessment tools were used focusing on summative use. The findings are presented based on the frequency and percentage of respondents following the use of each authentic assessment tool. The scale for degree of agreement ranks from strongly agree (SA) = 4.5 – 5.0 to strongly disagree (SD) = 1.0 – 1.4.

4.1.1. Summative use of portfolios

Under the summative use of portfolios, the findings were based on areas of competencies that indicated the rate of agreement and disagreement of the respondents towards its use as indicated in **Table 2**.

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Table 2. Summative use of Portfolio (N=231).

Item	SA	A	N	D	SD	Mean
Portfolios are used by instructors to grade students' achievements	12(5.2)	21(9.1)	28(12.1)	84(36.4)	86(37.2)	2.09
Portfolios are used by instructors to measure students' mastery of competencies	11(4.8)	15(6.5)	31(13.4)	97(42.0)	77(33.3)	2.11
Portfolios are used as tools to measure communication skills among students	9(3.9)	20(8.7)	35(15.2)	90(39.0)	77(33.3)	2.07
Portfolios are used to measure students' knowledge and understanding of concepts	9(3.9)	20(8.7)	35(15.2)	90(39.0)	77(33.3)	2.11
Instructors use portfolios to measure the ability of students in designing the assessment tools such as tests	5(2.2)	8(3.5)	22(9.5)	68(29.4)	128(55.4)	1.68
Portfolios are used by instructors to measure students' decision-making skills	8(3.5)	20(8.7)	47(20.3)	93(40.3)	63(27.3)	2.21
Portfolios are used to measure collaboration skills among students	4(1.7)	2(0.9)	21(9.1)	84(36.4)	120(51.9)	1.64
Overall						1.99

Key: Strongly Agree (SA) = (4.5 – 5.0), Agree (A) = (3.5 – 4.4), Neutral (N) = (2.5-3.4), Disagree (D) = (1.5 – 2.4), Strongly Disagree (SD) = (1.0 – 1.4)

Summative use of portfolios focused on seven competence areas. The undergraduate science students were required to provide opinions by choosing the item based on the Likert scale; strongly agree, agree, neutral, disagree, and strongly disagree. The findings indicated that the majority of the respondents had a high rate of disagreement in all seven areas. However, the two areas had a higher rate of disagreement than other areas. The first was on the use of portfolios to measure collaboration skills among students. The results indicated the majority 120 (51.9%) of the respondents strongly disagreed, and 84 (36.4%) disagreed respectively as indicated in Table 2. The second was on summative use of portfolios to measure the ability of students in designing the assessment tools such as tests. The results indicated that the majority 128 (55.4%) of the respondents strongly disagreed, and 68 (29.4%) disagreed respectively. The overall mean for the summative use of portfolios is 1.99 indicating respondents to disagree with such use.

Similarly, the qualitative findings through interviews indicated portfolios to be minimally used in some educational courses and not used at all in some biology and chemistry courses. This might be the reason why respondents indicated the highest rate of disagreement on the summative uses of portfolios. The emphasis is made by one of the undergraduate science student-teacher from institution 'A' on the use of portfolios who said:

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Portfolios are used only in some education courses such as CT 100, CT 107, and CT 108 once per semester in the first year. But also, CT 304 for those taking BED Science portfolios is used once per semester. In other biology and chemistry courses portfolios are not used at all (Student 2, Institution A, 9th April 2021).

Another student from institution 'A' had this to say:

When it comes to portfolios not very often used it depends on the course; it might be once per semester or twice per annum. For example, some courses in science teaching methods tend to use portfolios once per semester (Student 3, Institution A, 9 April 2021).

4.1.2. Summative use of practical work

Summative use of practical work by instructors indicated seven areas based on its use for the sake of grading learners' achievement rather than improvement of the teaching and learning processes. The focus was on the rate of agreement and disagreement among undergraduate science students toward the summative uses of practical work. The findings from the undergraduate science students are presented in **Table 3**.

Table 3. Summative use of practical work.

Item	SA	A	N	D	SD	Mean
Practical works are used by instructors to grade students' achievements	9(3.9)	6(2.6)	29(12.6)	99(42.9)	88(38.1)	4.08
Practical works are used by instructors to measure students' mastery of competencies	2(0.9)	5(2.2)	39(16.9)	99(42.9)	86(37.2)	4.13
Practical works are used as tools to measure communication skills among students	5(2.2)	9(3.9)	32(13.9)	117(50.6)	68(29.4)	4.01
Practical works are used to measure students' knowledge and understanding of concepts	11(4.8)	6(2.6)	37(16.0)	94(40.7)	83(35.9)	4.00
Instructors use Practical works to measure the ability of students in designing assessment tools such as tests	3(1.3)	7(3.0)	23(10.0)	86(37.2)	112(48.5)	4.28
Practical works are used by instructors to measure students' decision-making skills	6(2.6)	4(1.7)	19(8.2)	92(39.8)	110(47.6)	4.28
Practical works are used to measure collaboration skills among students	4(1.7)	4(1.7)	27(11.7)	77(33.3)	119(51.5)	4.31
Overall mean						4.15

Key: Strongly Agree (SA) = (4.5 – 5.0), Agree (A) = (3.5 – 4.4), Neutral (N) = (2.5-3.4), Disagree (D) = (1.5 – 2.4), Strongly Disagree (SD) = (1.0 – 1.4)

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Summative use of practical work by instructors had a high rate of agreement as per the respondents' views. However, the two competence areas had a higher rate of agreement than the other five competence areas. The first competence was on the uses of practical works by instructors to measure students' decision-making skills. The findings indicated that 110 (47.6%) of the respondents strongly agreed, and 92 (39.8%) agreed respectively. The second competence was on the summative uses of practical works to measure collaboration skills among students. The results indicated that the majority 119 (51.5%) of the respondents strongly agreed, and 77 (33.3%) agreed respectively as indicated in Table 3. The overall mean for the response for all respondents was 4.15, implying that have a high degree of agreement on the summative use of practical works.

Likewise, qualitative findings through interviews are the same as the quantitative findings as they indicated practical works were used summatively for the sake of grading learners' achievement. They were not used for the sake of improving learning among undergraduate science students rather than grading. For example, the instructor from institution 'A' justifies the summative use of practical work with the following comment:

> *…… the nature of our students is that when you go for formative alone few of them will be serious in studying. They are concerned with how much will they get. How much can I score if I do this? So, if you just consider formative few students will do the tasks. I do provide tasks to my students for the aim of grading (Instructor 3, Institution A, 8 April 2021).*

Similarly, another instructor from institution 'A' placed emphasis on grading which forms summative use as follows:

> *I can say I'm using them both formatively and summatively but in the end I will grade them. Therefore, in the process, I use formatively, but at the end of the day, I assign scores to students based on their achievement. I do this to improve learning but at the end of the day, there will be grades assigned (Instructor 2, Institution A, 8th April 2021).*

The response indicates summative use of practical work with the emphasis placed on grading rather than improvement of the learning process through feedback provision. The instructor did not explain how the task intended for grading could be used to improve the learning processes among students.

4.1.3. Summative use of teaching practice

Under the summative use of teaching practice, the findings were based on areas of competencies that indicated the rate of agreement and disagreement of the respondents towards the use of portfolios as indicated in **Table 4**.

The opinions of the respondents on the summative use of teaching practice were sought in the seven areas of competencies. The findings indicated respondents disagree with the summative uses of teaching practice by instructors (**Table 4**). However, one of the competencies had the highest rate of disagreement as compared with other competencies. This was competence in the uses of teaching practice by instructors to grade students' achievement. The findings indicated that the majority 135 (58.4%) of the respondents strongly disagreed, and 37 (16%) disagreed. Respondents also disagreed on the summative uses of the teaching practice in other competencies as indicated in Table 4. The overall mean for the responses on summative use of teaching practice concerning competence acquisition was 2.53 implying a certain degree of disagreement on such use.

Qualitative findings indicated that teaching practice was used for formative assessment hence the reason for the highest rate of disagreement on the summative use.

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Table 4. Summative use of teaching practice.

Item	SA	A	N	D	SD	Mean
Teaching practice is used by instructors to grade students' achievements	135(58.4)	37(16.0)	18(7.8)	10(4.3)	31(13.4)	1.98
Teaching practice is used by instructors to measure students' mastery of competencies	59(25.5)	55(23.8)	39(16.9)	30(13.0)	48(20.8)	2.79
Teaching practice is used as a tool to measure communication skills among students	53(22.9)	63(27.3)	49(21.2)	38(16.5)	28(12.1)	2.67
Teaching practice is used to measure students' knowledge and understanding of concepts	82(35.5)	55(23.8)	43(18.6)	23(10.0)	28(12.1)	2.39
Instructors use teaching practice to measure the ability of students in designing assessment tools such as tests	97(42.0)	52(22.5)	24(10.4)	22(9.5)	36(15.6)	2.34
Teaching practice is used by instructors to measure students' decision-making skills	86(37.2)	37(16.0)	36(15.6)	20(8.7)	52(22.5)	2.63
Teaching practice is used to measure collaboration skills among students	57(24.7)	40(17.3)	51(22.1)	36(15.6)	47(20.3)	2.89
Overall Mean						2.53

Key: Strongly Agree (SA) = (4.5 – 5.0), Agree (A) = (3.5 – 4.4), Neutral (N) = (2.5-3.4), Disagree (D) = (1.5 – 2.4), Strongly Disagree (SD) = (1.0 – 1.4)

4.1.4. Summative use of projects

Under the summative use of projects, the findings were based on areas of competencies that indicated the rate of agreement and disagreement of the respondents towards its use as indicated in **Table 5**.

The findings are presented based on seven areas of competencies. The findings indicate the degree of agreement among the respondents on the summative uses of projects by instructors. In seven competencies, however, two competencies show a higher rate of agreement than others. The first competence was projects are used by instructors to grade students' achievements. The findings indicated that the majority of 169 (73.2%) of the respondents strongly agreed, and 30 (13%) agreed. The second competence was projects are used by instructors to provide feedback to students on mastery of competencies. The results indicated that the majority of 173 (74.9%) of the respondents strongly agreed, and 34 (14.7%) agreed. The results for all competencies are summarized in Table 5. The overall mean for the responses on the summative use of projects is 4.32 implying a degree of agreement on the use of projects summatively.

Through interviews, the findings revealed that projects were used summatively for the sake of grading students. For example, one instructor from institution 'A' said:

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……we also do projects e.g., pedagogical issues in mathematics then we provide students with work then they do the investigation and are given time to present and then given some grades (Instructor 1, Institution A, 8 April 2021).

The emphasis from the respondent shows the summative use of projects for the sake of grading learners.

Findings also indicated summative use of authentic assessment tools as respondents especially instructors emphasize the use of such tools for grading which implies summative aspects. All six respondents stated that they assigned grades in all tasks provided to students. They believed if the tasks are graded learners might put more effort into doing the tasks hence leading to competencies acquisition. The use of authentic assessment tools formatively should not involve grading but rather comments for improvement; however summative use may involve grading. The findings show instructors to put more emphasis on grading.

Table 5. Summative use of projects.

Item	SA	A	N	D	SD	Mean
Projects are used by instructors to grade students' achievements	10(4.3)	3(1.3)	19(8.2)	30(13.0)	169(73.2)	4.49
Projects are used by instructors to measure students' mastery of competencies	6(2.6)	4(1.7)	14(6.1)	34(14.7)	173(74.9)	4.57
Projects are used as tools to measure communication skills among students	26(11.3)	6(2.6)	12(5.2)	42(18.2)	145(62.8)	4.18
Projects are used to measure students' knowledge and understanding of concepts	32(13.9)	5(2.2)	17(7.4)	24(10.4)	153(66.2)	4.12
Instructors use Projects to measure the ability of students to design assessment tools such as tests	9(3.9)	16(6.9)	32(13.9)	58(25.1)	116(50.2)	4.10
Projects are used by instructors to measure students' decision-making skills	15(6.5)	7(3.0)	21(9.1)	47(20.3)	141(61.0)	4.26
Projects are used to measure collaboration skills among students	8(3.5)	8(3.5)	7(3.0)	40(17.3)	168(72.7)	4.52
Overall mean						4.32

Key: Strongly Agree (SA) = (4.5 – 5.0), Agree (A) = (3.5 – 4.4), Neutral (N) = (2.5-3.4), Disagree (D) = (1.5 – 2.4), Strongly Disagree (SD) = (1.0 – 1.4)

4.2. Discussion

The undergraduate science student-teachers indicated disagreement on the summative use of portfolios by instructors. The findings indicated instructors minimally used portfolios in some of the courses of education and not at all in science courses. Despite the minimal use

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of portfolios in some education courses, they were used on a summative basis. The reasons for disagreement among respondents concerning the summative use of portfolios are based on lack of use in science courses namely biology and chemistry. They were used minimally in some education courses for the sake of grading.

The findings are in line with Klenowski *et al*. (2006) and Orland-Barak and Maskit (2017) who commented on the summative use of portfolios for the sake of measuring learning. They insisted that portfolios were used to indicate if learning was achieved by students that were then accompanied by grading. Likewise, Yu (2019) insisted on the summative use of portfolios in measuring the learning progress among student-teachers. The summative use of portfolios for grading the learning achievement of science student-teachers.

Practical work was used on a summative basis since respondents indicated a high rate of agreement on such use. This means that the emphasis was placed on its use for grading and decision-making on whether learning took place or not. It involved students in report writing after conducting experiments aimed at grading them. Since the emphasis was grading; students put more effort into the acquisition of grades than learning or competencies accompanied by such tasks.

The findings concur with Abrahams *et al*. (2013) and Schwichow *et al*. (2016) who indicated practical work to serve a summative role. Similarly, Osborne 2015 indicated practical work to be misused in the process of learning because was used summatively for measuring learning. They used practical work to measure if learning has taken place or not. Mogali *et al*. (2020) support the summative use of practical work in measuring learning, however, is one of the instructor-centred approaches that makes learners passive in the process of learning. The passive nature of students in the learning process tends to negatively affect the enhancement of students' learning.

Teaching practice was found to be used on a summative basis, though at minimal rates. Undergraduate science student-teachers indicated disagreement on the summative use of teaching practice in the universities under study. The reason for disagreement was that it was found to be used for the improvement of teaching competencies among student-teachers. They were given feedback throughout teaching practice that helped them improve teaching strategies by both host or experienced teachers and university assessors. That being the case, summative use of teaching practice was considered to be minimal since grading was done after intensive formative feedback.

Contrary to the findings, Amankwah *et al*. (2017), Jarrah (2020), and Makafane (2020) insisted on the contribution of teaching practice in enhancing learning leading to competencies acquisition among students. Likewise, Flores (2015) insisted on the use of teaching practice to increase pedagogical competencies. They support the view that teaching practice was used minimally on a summative basis.

5. CONCLUSION

The findings of the study indicated the summative use of authentic assessment tools to be dominant in education courses, and not used in science courses. The summative use of authentic assessment tools might not lead to competence acquisition as expected since the exposure and emphasis of the learning might be minimal. This in turn may lead to inadequate acquisition of competencies among undergraduate science student-teachers because of lack of enhancement of learning.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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