Competence-Based Assessment in Tanzanian Teacher Education in the Fourth Industrial Revolution: A Comprehensive Analysis

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ABSTRACT

Competence-based assessment plays a pivotal role in shaping the quality and effectiveness of teacher education programs in the dynamic landscape of the Fourth Industrial Revolution (4IR). Understanding the existing assessment practices and their alignment with competence-based principles is essential for enhancing the preparation of future educators in this context. This study examined the assessment practices in Tanzanian teacher education programs gaining insights into how student teacher assessment is done and the alignment of competence-based principles in the preparation of student teachers. A survey involving 531 participants was conducted to gather data on Statistical analysis were employed to explore variations in assessment experiences based on gender, age, and education level. The findings indicate that traditional pen-and-paper assessments remain the dominant assessment method in Tanzanian teacher education, comprising a substantial 69%. Notably, 52% of student teachers believe are evaluated on their aptitude to seamlessly integrate technology into teaching and learning, accentuating the criticality of digital skills. Furthermore, our study unveils a multifaceted assessment landscape for innovation and critical thinking, with 25.2% of students always feeling assessed, in contrast to 13.6% who seldom or never experience this evaluation. Remarkably, gender emerges as a potent influencer in technology integration assessments, while age distinctly shapes the evaluation of research skills and collaborative abilities. Moreover, the findings

underscore that competence-based assessment in Tanzanian teacher education is progressively adapting to meet the demands of the 4IR. However, they also underscore the need for a more diversified and innovative assessment approach to effectively address the evolving educational landscape. This study highlights the pronounced impact of gender, age, and education level on assessment experiences, underscoring the imperative for tailored approaches in nurturing future educators.

Keywords: Competence-based assessment, teacher education, assessment methods, fourth industrial revolution

INTRODUCTION

In the fourth industrial revolution (4IR) context, teacher education plays a pivotal role in preparing educators to effectively respond to the evolving demands of this transformative era (Navani & Nag, 2021; Weleschuk et al., 2019). Competence-based teacher education introduces a change in thinking, emphasizing that learners are not mere recipients of knowledge but active participants in their learning journeys, empowered to take charge of the educational process (Awodiji & Katjiteo, 2023; Boud et al., 2020). The competency-based approach places a strong emphasis on acquiring 4IR skills, which include critical thinking, problem-solving, digital literacy, creativity, communication, and collaboration. These skills are crucial for navigating the complexities of the 4IR, where adaptability and agility are paramount (P21, 2007). Competence-based assessment practices in teacher education programs need to evolve to effectively address the demands of the 4IR. This evolution entails harnessing technology for assessment purposes and addressing the unique challenges faced by developing countries, such as Tanzania, in integrating these innovations (Kayembe & Nel, 2019). By doing so, teacher education programs can better equip future educators with the competencies required to navigate the complexities and seize the opportunities presented by the 4IR (Bogers et al., 2022; Mohamed Hashim et al., 2022; Nguyen & Khuong, 2020). In 4IR, the landscape of learning has undergone a profound and disruptive transformation driven by digital

technologies such as augmented reality, virtual reality, and online learning (Reaves, 2019). This shift has placed a significant emphasis on the need to equip educators with an understanding of these changes and the ability to impart relevant skills to learners (Adegbite & Adeosun, 2021). As education evolves in response to technological advancements, it becomes imperative to embrace competency-based assessments that foster individual growth and creativity. Competence-based assessment practices in the 4IR require clear objectives, and active learner involvement (Reaves, 2019). 4IR demands specific skills for navigating and harnessing innovative technologies (P21, 2007). These competencies include complex problem-solving, critical thinking, creativity, and intercultural fluency, all of which have a universal presence in various global skill frameworks (Kayembe & Nel, 2019; Reaves, 2019; World Economic Forum, 2018). In contemporary education, competence-based assessment has become indispensable (Kitta & Tilya, 2010). It engages learners of all backgrounds, fosters continuous development, and promotes personal growth. The central focus of authentic assessment lies in individual improvement rather than comparative evaluation (Kitta & Tilya, 2010). These assessments serve as informative tools for both learners and educators, shedding light on the learning and teaching processes (Sanga, 2017). Effective competency-based assessment prepares graduates for a dynamic job market, ensuring that assessments remain dependable, valid, and adaptable to evolving needs (Bukhari et al., 2023; Kayembe & Nel, 2019; Popkova, 2020).

Competency-based Assessment Approach in Teacher Education

The Competency-based Assessment is an approach that focuses on assessing students' mastery of specific skills, knowledge, and abilities that are relevant in the context of the 4IR. In this model, the emphasis is on measuring students' ability to apply their knowledge and skills in authentic, real-world situations, rather than relying solely on traditional knowledge-based assessments. Competencies assessed may include critical thinking, problem-solving, collaboration, adaptability, digital literacy, and other skills that are crucial in the 4IR (Herppich et al., 2018; Kitta & Tilya, 2010). Competency-based Assessment aligns

with the needs of the 4IR, where rapid technological advancements and changing work environments require individuals to possess a broader set of skills beyond academic knowledge. According to the World Economic Forum (2018) the 4IR is dominated by the fusion of technologies, blurring the boundaries between the physical, digital, and biological realms which demands a workforce that can adapt to innovative technologies, think critically, and solve complex problems. One example of a competency-based assessment framework is the one developed by the Partnership for 21st Century Skills (P21). The P21 framework identifies essential skills, including critical thinking, problem-solving, collaboration, communication, creativity, information literacy, media literacy, technology literacy, and flexibility. Assessments based on this framework focus on evaluating students' mastery of these competencies through authentic performance tasks and projects. By emphasizing the practical application of knowledge and skills, this assessment model helps prepare students for the challenges and opportunities of the modern world (P21, 2007).

Assessment Practices in Teacher Education Programs in Tanzania

In Tanzania, teacher education programs employ diverse assessment practices to evaluate student teachers' knowledge, pedagogical skills, and professional dispositions. Common assessment methods encompass written examinations, teaching demonstrations, lesson-planning tasks, reflective journals, and portfolios (Omwodo et al., 2019). Written examinations gauge theoretical subject matter knowledge, educational theories, and teaching strategies, primarily relying on multiple-choice questions and essay prompts. However, Oluoch (2019) argue that this approach may not effectively assess practical teaching abilities and real-world application teaching demonstrations and lesson planning tasks assess pedagogical skills and instructional planning. Student teachers are observed while designing and delivering lessons to assess their ability to engage students, employ effective teaching strategies, and manage classroom dynamics (Orodho et al., 2020). Reflective journals and portfolios assess student teachers' capacity for self-reflection, critical thinking, and professional growth. They document teaching experiences, challenges, and

successes (Nyakwara et al., 2018; Tanzania Institute of Education, 2019). In Tanzania, assessment in both certificate and diploma programs heavily relies on summative written exams, with limited emphasis on practical training. Students must pass exams in subject content, pedagogical content, and education studies (Tanzania Institute of Education, 2019). Bachelor's degree programs, offered by autonomous colleges and universities, follow a similar curriculum with summative exams at the end of each semester, however, still written exams are prevalent, with limited task-based assessment (NACTE, 2004).

Shortcomings in the Existing Assessment Practices

While assessment practices in teacher education programs in Tanzania serve certain purposes, they are not without shortcomings. Several key limitations can be identified, necessitating a critical examination of the existing assessment practices. One of the primary shortcomings is the overemphasis on summative assessments, such as written examinations, that primarily focus on knowledge recall rather than the application of knowledge in authentic teaching contexts (Oluoch, 2019). This approach may not adequately measure student teachers' pedagogical skills, critical thinking abilities, and capacity to address diverse student needs. Furthermore, the current assessment practices often lack a comprehensive and holistic approach to evaluating student teachers' development across multiple dimensions (Orodho et al., 2020). Assessments tend to focus on discrete skills or isolated tasks, rather than considering the integration of knowledge, skills, and dispositions that are necessary for effective teaching. Another limitation is the limited use of technology-mediated assessments in teacher education programs (Omwodo et al., 2019; Nyakwara et al., 2018). With the rapid integration of technology in the education sector, there is a need to explore innovative assessment methods, such as video-based observations, digital portfolios, and online simulations, to better evaluate student teachers' competencies in utilizing technology for instructional purposes. Further, studies (Fernández et al., 2023; Haleem et al., 2022; Mohamed Hashim et al., 2022; Shetty et al., 2023; Vieira & Pedro, 2023) are suggesting that found that initial teacher

education programs do not adequately prepare future teachers to meet the demands of today's digital society due to insufficient integration of Information and Communication Technologies (ICT).

The Impact of Gender, Age, and Educational Background

Gender, age, and education are critical dimensions that intersect and influence the assessment practices and outcomes in teacher education programs. This literature review explores how these factors impact the assessment of aspiring teachers, shedding light on the complexities and challenges faced in ensuring equitable and effective assessments. Gender plays a significant role in the assessment of student teachers. Research indicates that gender bias can affect the evaluation of teaching skills and subject knowledge. Martin et al., (2016) reported that female student teachers may face biases related to stereotypes about nurturing and classroom management which can impact their teaching performance. Conversely, male student teachers may encounter biases associated with assumptions about their competence in specific subject areas. Age is another dimension influencing assessment practices in teacher education programs. Mature or older student teachers, often referred to as non-traditional students, bring a wealth of life experiences and prior career knowledge to their teacher training. While this can be an asset, it may also introduce challenges in adapting to new pedagogical approaches and technology (Drame et al., 2020). Additionally, educational background is a crucial factor affecting student teachers' assessment. Variations in prior education can result in disparities in subject knowledge and pedagogical skills. For instance, student teachers with diverse educational backgrounds, such as those with degrees in science or engineering transitioning to teaching, may require tailored assessment approaches to address their unique needs (Ingvarson et al., 2021; Perez-Felkner et al., 2012).

Methodology

The study employed a quantitative data collection approach, using a structured survey to collect the data from educational stakeholders to comprehensively investigate competency-based assessment in Tanzanian teacher education. This approach allows for a multifaceted

exploration of the research questions. A total of 531 participants participated after purposive sampling to ensure representation across various institutions, regions, and roles within teacher education programs. A structured survey gathered responses about assessment methods in Tanzanian teacher education and the incorporation of 4IR skills, the survey included closed-ended and open-ended questions. SPSS software was used to analyse data obtained in the survey by using descriptive statistics like frequencies and percentages, means, as well as inferential techniques such as regression analysis. In the study, out of the 531 participants, 50.9% were male, 47.1% female and 2.1% preferred not to disclose their gender. This indicates a balanced representation of male and female participants in the study.

Table 4: Gender Distribution of Participants (n=531)

Gender	Number of participants	Per cent
Male	269	50.9
Female	249	47.1
Prefer not to say	11	2.1

This distribution is important in the context of the 4IR as it highlights the inclusivity of the study and allows for a comprehensive understanding of the perspectives and experiences of student teachers. The largest group (46.9%) falls below the age of twenty-five, and the small group consisting of 9.3% were above the age of forty-five.

Table 5: Age Distribution of Participants (n = 531)

Age range	Number of participants	Per cent
Below 25	248	46.9
25 - 34	131	24.8
35 - 44	101	19.1
above 45	49	9.3

Age distribution offered a diverse age range among the participants, with a higher representation of younger individuals, particularly those below the age of twenty-five, which suggests the study captures the

perspectives and experiences of a generation of pre-service student teachers who are living in the 4IR.

Findings and Discussion

The Current Assessment Practices in Teacher Education Programs in Tanzania

The participants' responses about the current assessment practices utilized in Tanzanian teacher education programs indicate; Coaching and Mentorship (37%), Pen and Paper (69%), Project-based (42%), Incubation (7%), Action Research (20%) and other methods (1%).

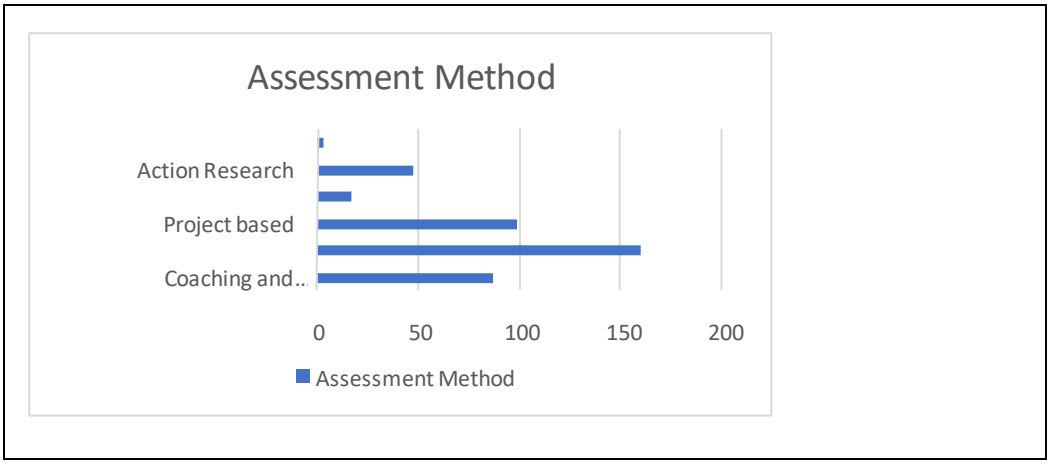

Figure 2: Current Common Assessment Method in Higher Education to Assess Student Teachers

The findings, showing that 69% of teacher education program respondents rely heavily on pen-and-paper assessments, prompt a closer look at the impact of traditional assessment methods. Existing literature offers insights into both the advantages and disadvantages of this approach. Pen-and-paper assessments excel in efficiently evaluating large groups and enabling standardized, bias-reduced grading (Brown & Knight, 2015; Popham, 2009). However, they can inadvertently promote rote memorization, stifle critical thinking, and hinder creativity (Smith & Ragan, 2005; Tofade et al., 2013). They may not align with real-world skills, raising concerns about authenticity and relevance (Wiggins, 1998). These assessments may also overlook factors like psychology, culture, and context (Brown, 2022). To address the

multifaceted skills required of future educators, teacher education programs should explore a variety of assessment methods alongside traditional ones (Komba & Mwakabenga, 2021).

Assessment of 4IR skills in Teacher Education

In the context of teacher education and the imperative of preparing future educators for the 4IR, it is crucial to underscore the significance of aligning assessment practices with competence-based principles. This alignment not only enhances the readiness of prospective educators but also ensures that assessments effectively incorporate the essential 4IR skills, as defined by the Partnership for 21st Century Skills in 2007. These skills encompass Live and Career Skills, Learning and Innovation Skills, as well as Information, Media, and Technology Skills. The following parts are the findings of how 4IR skills integration in assessment in teacher education in Tanzania.

Assessing the Integration of Technology into Teaching and Learning

Respondents' perspective on the proficiency of assessment methods in incorporating technology varies differently with most respondents agreeing to the statement. The study findings are in Table 3.

Table 6: Ability to Integrate Technology in Teaching and Learning

Responses	Frequency	Per cent
Strongly Disagree	4	.8
Disagree	20	3.9
Neutral	14	2.8
Agree	167	32.9
Strongly Agree	264	52.0

The findings indicate that most student teachers highly value its assessment. Approximately 84.9% (combining those who strongly agree and agree) acknowledge the importance of assessment on their ability to integrate technology into their teaching and learning practices. This aligns with prior research showing positive attitudes (Djoub, 2018; Hartman et al., 2019; Merillo & Domingo, 2019; Tzafilkou et al., 2023). Moreover, student teachers in the study by Sreekala and

Maria (2017) perceived technology integration assessments as burdensome rather than beneficial. Merillo and Domingo (2019) highlighted frustrations among student teachers due to inconsistent support and unclear assessment criteria for technology integration. Tzafilkou et al. (2023) pointed out a gap between the perceived relevance and actual skill development in technology integration assessments. These studies offer alternative viewpoints, underscoring challenges, and concerns in teacher education programs in integrating technology in assessment.

Assessing the usage of Technology as a Tool for Research

When examining technology's role as a tool for research, there is a similar positive perception among student teachers as indicated in Table 4.

Table 7: Ability to use Technology as a Tool for Research

Responses	Frequency	Per cent
Strongly Disagree	25	6.7
Disagree	11	2.9
Neutral	70	18.7
Agree	189	50.5
Strongly Agree	79	21.1

The findings indicate over 71.6% of respondents agree or strongly agree with the assessment of their skills in using technology for research purposes. Multiple studies echo our findings, highlighting the importance of technology integration and research skills in teacher education. For example, Hartman et al. (2019) and Merillo and Domingo (2019) conducted similar studies, emphasizing the significance of teacher candidates' proficiency in technology integration. These studies align with our results, emphasizing a consensus among student teachers regarding the importance of technology integration in their assessments. Likewise, Sreekala and

Maria (2017) emphasize the critical role of technology in modern education, supporting our findings regarding student teachers' positive perceptions of technology as a research tool. However, Gomez et al. (2022) present a slightly distinct perspective, suggesting that while technology integration is crucial, there may be variations in student teachers' perceptions of its importance in their assessments. Additionally, Merillo and Domingo (2019) suggest that student teachers may have reservations about assessing technology research skills, potentially explaining the notable neutral responses in our data.

Assessing the ability to offer Innovative Ideas, Strategies, and Solutions

The findings offer insights into how student teachers' assessment is done in terms of their ability to generate innovative ideas, devise strategies, and present solutions. The findings reveal a diverse spectrum of assessment frequencies, with a mere 0.8% of respondents claiming have never been in this capacity.

Table 8: Ability to offer Innovative Ideas, Strategies, and Solutions

Response	Frequency	Per cent
Never	4	.8
Rarely	66	12.8
Sometimes	156	30.3
Often	159	30.9
Always	130	25.2

The findings indicate that student teachers have opportunities for assessments related to creativity and innovation. However, there is a segment for whom these assessments are infrequent, suggesting variations in assessment practices across different teacher education programs. This highlights the potential need for a more consistent and comprehensive approach to foster and evaluate creativity and

innovation in future educators. Studies like Hartman et al. (2019) and Sreekala and Maria (2017) support the importance of assessing and nurturing these abilities in teacher preparation. However, Nakano and Weschsler (2018), Perry and Collier (2018), Twist (2021), and UNESCO (2021) offer opposing perspectives, suggesting caution in overemphasizing these assessments due to potential stifling effects and concerns about fairness, bias, and equity.

Assessing ability to Evaluate and Interpret Ideas and Information

The findings reveal the distribution of assessments and evaluations of student teachers' ability to evaluate and interpret ideas. A substantial portion (34.5%) indicated occasional assessments and a similar percentage (35.9%) reported frequent assessments.

Table 9: Ability to Evaluate and Interpret Ideas

Response	Frequency	Per cent
Never	3	.8
Rarely	24	6.7
Sometimes	123	34.5
Often	128	35.9
Always	79	22.1

These findings imply that most student teachers have opportunities for assessments related to this skill, albeit with variability in the frequency of such assessments. Similar findings in the studies by Liu et al. (2014), Lorencová et al. (2019), and S. E. Anderson et al. (2011) underscoring the value of assessing critical thinking and interpretive abilities in teacher candidates to ensure the quality of teacher education. However, other studies highlight the complexities and challenges in assessing interpretation and evaluation skills among student teachers. Research by Bambawale et al. and Wanner & Palmer (2018) points out difficulties in adequately assessing these competencies, while S. E. Anderson et al. (2011) indicated the nuanced nature of these skills

within teacher education assessment, which may pose measurement challenges.

Assessing ability to Organize, Evaluate, and Communicate Information

When asked about assessment on the ability to organize, evaluate and communicate, a small percentage (2.8%) strongly disagree, 4.7% disagree, 10.8% remain neutral while most student teachers acknowledge their proficiency in this area, with 54.4% agreeing and 27.3% strongly agreeing with the statement.

Table 10: Ability to Demonstrate Skills in Organizing, Evaluating, and Communicating Information

Responses	Frequency	Per cent
Strongly Disagree	10	2.8
Disagree	17	4.7
Neutral	39	10.8
Agree	197	54.4
Strongly Agree	99	27.3

These results suggest that student teachers believe they have assessed their skills in organizing, evaluating, and effectively communicating information. Similarly, Hartman et al. (2019) found these skills correlate with effective classroom instruction. Studies by Merillo and Domingo (2019) and Sreekala and Maria (2017) show that comprehensive training in these areas leads to greater instructional effectiveness. These findings align with most respondents who reported possessing these skills, indicating program recognition. However, Anderson et al. (2011) noted a gap between claimed emphasis and actual assessment rigour in teacher education.

Assessing the ability to Collaborate and Contribute to the Project Teams

The findings indicate that 8% of student teachers never assessed, and 5.7% mentioned that assessment occurs rarely. Moreover, for 31.7%

assessment happens sometimes, 27.8% assessed often and 32.6% felt they always assessed and evaluated on their ability to collaborate and contribute to project teams.

Table 11: Ability to Collaborate and Contribute to the Project Teams

Response	Frequency	Per cent
Never	8	2.3
Rarely	20	5.7
Sometimes	112	31.7
Often	98	27.8
Always	115	32.6

These findings suggest that the assessment of collaboration and contribution to project teams is common among student teachers. Research by Anderson et al. (2011) found effective collaborators create engaging classrooms. Sreekala and Maria (2017) showed teachers trained in collaboration reported higher job satisfaction. However, Beniwal (2020) and Kolleck et al., (2021) argue programs may overestimate skill development. This instigates further findings with actual teaching practices not based on a self-reported assessment.

Impact of Gender, Age, and Education on Assessment Practices

To assess how age, gender, and education impact competency-based assessment in integrating 4IR skills among student teachers, a regression analysis of the findings indicated the impact of each variable. The study focused on six key assessment areas: Collaborating and contributing to project teams, using technology for research, evaluating, and interpreting ideas, integrating technology into teaching, offering innovative solutions, and organizing, evaluating, and communicating information.

Gender

The ANOVA results show a significant relationship between the Gender variable and the predictors in the model. Overall, the model explains the variance in Gender ($F = 11.149$, $p < .001$), indicating that

the predictors collectively contribute to understanding Gender differences.

Table 12: ANOVA on the Impact of Gender

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.857	6	2.643	11.149	.000[b]
	Residual	76.801	324	.237		
	Total	92.659	330			

a. Dependent Variable: Gender

These ANOVA findings suggest that there are significant differences in the assessment and evaluation of various skills and abilities between different genders. Further coefficients reveal the specific nature of these differences and their implications for teacher education programs and practices.

Table 13: Coefficients Analysis on the Impact of Gender

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.846	.139		6.077	.000
	Integration of technology into teaching and learning	-.117	.041	-.206	-2.873	.004
	Technology as a tool for research	.033	.039	.060	.853	.395
	Innovative ideas, strategies, and solutions	.098	.046	.168	2.138	.033
	Evaluating and interpreting the ideas and information.	.149	.038	.292	3.952	.000
	Organizing, evaluating, and communicating information	-.118	.041	-.205	-2.913	.004
	Collaborating and contributing to the project teams	.126	.036	.246	3.478	.001

a. Dependent Variable: Gender

Gender influences the assessment of various skills in student teachers. Specifically, male student teachers tend to receive lower scores in

assessments related to integrating technology into teaching, as well as evaluating and interpreting ideas, compared to their female counterparts. Conversely, female student teachers tend to score higher in assessments related to organizing, evaluating, and communicating information, offering innovative ideas and strategies, and collaborating in project teams. However, there is no significant gender difference in assessments related to using technology as a research tool.

Age

The ANOVA results for the dependent variable "Age" indicate statistically significant differences among the predictor variables.

Table 14: ANOVA on the Impact of Age

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.617	6	9.770	13.504	.000[b]
	Residual	234.392	324	.723		
	Total	293.009	330			

a. Dependent Variable: Age

The regression model was significant (F = 13.504, p < .001), suggesting that these predictor variables collectively explain a significant amount of variance in age. Table 12 indicates the value of each predictor.

Table 15: Coefficients Analysis on the Impact of Gender

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.262	.243		13.422	.000
	Integration of technology into teaching and learning	.103	.071	.102	1.452	.147
	Technology as a tool for research	-.384	.068	-.391	-5.628	.000
	Innovative ideas, strategies, and solutions	.020	.080	.019	.252	.801
	Evaluating and interpreting the ideas and information.	.313	.066	.344	4.751	.000
	Organizing, evaluating, and communicating information	-.124	.071	-.121	-1.750	.081
	Collaborating and contributing to the project teams	-.271	.063	-.297	-4.280	.000

a. Dependent Variable: Age

The findings indicate that age is impacting certain variables in assessment practices. Specifically, the ability to use technology as a research tool is associated with younger ages, while higher scores in the ability to offer innovative ideas, strategies, and solutions and the

ability to collaborate and contribute to project teams impacted by older ages. However, age does not impact technology integration, organizing and evaluating information, and evaluating and interpreting ideas.

Education

The findings indicates that the variable Highest level of Education significantly affects the predictors in the model ($F = 6.036$, $p < .001$). This suggests that there are statistically significant differences in the highest level of education among student teachers based on their experiences on assessment.

Table 16: ANOVA on the Impact of Education

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.951	6	5.992	6.036	.000[b]
	Residual	321.651	324	.993		
	Total	357.601	330			

a. Dependent Variable: Highest level of Education

The table of coefficients indicates each predictor affected by education level on assessment practices and whether it is significant or not.

Table 17: Coefficients Analysis on the Impact of Gender

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.685	.285		16.454	.000
	Integration of technology into teaching and learning	.139	.083	.125	1.678	.094
	Technology as a tool for research	-.047	.080	-.043	-.586	.558
	Innovative ideas, strategies, and solutions	-.201	.093	-.177	-2.155	.032
	Evaluating and interpreting the ideas and information.	.268	.077	.268	3.481	.001
	Organizing, evaluating, and communicating information	-.153	.083	-.135	-1.843	.066
	Collaborating and contributing to the project teams	-.256	.074	-.254	-3.449	.001

a. Dependent Variable: Highest level of Education

The findings reveals that the ability to organize, evaluate, and communicate information (Beta = -.177, p = .032) and the ability to offer innovative ideas, strategies, and solutions (Beta = .268, p = .001) is significantly influenced by the level of education among student

teachers. These two abilities are impacted by the highest level of education attained by student teachers. However, the highest level of education does not affect the abilities related to technology integration, using technology for research, evaluating, and interpreting ideas, and collaborating and contributing to project teams.

Conclusion

The findings from Tanzanian teacher education programs' assessment practices reveal that most student teachers' common assessment method is traditional pen-and-paper tests, which may prioritize memorization over critical thinking. Secondly, a significant majority feel assessed on their ability to integrate technology into teaching and research, showing that institutions emphasize technology's importance. Additionally, student teachers recognize the significance of research skills using technology. When it comes to innovation skills there's room for improvement in fostering creativity. Findings indicate most student teachers participate in assessment evaluating and interpreting ideas, but variability exists.

Finally, organizing, evaluating, and communicating information is important in teacher education programs. The assessment practices also vary by gender, age, and education level. Gender significantly impacts assessment practices, with variations observed in technology integration, research skills, innovation, and collaboration assessments. Age also plays a role, particularly in research skills and collaboration assessments. Education level affects assessments related to technology integration, organizing, and communicating information, offering innovative ideas, and collaboration. The findings highlight the prevalence of traditional assessment methods and the importance of technology integration and research skills in teacher education programs in Tanzania. They also suggest room for improvement in fostering innovation and creativity and ensuring consistent assessment practices across programs. Additionally, gender, age, and education level significantly impact assessment experiences, indicating the need for tailored approaches in teacher education.

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