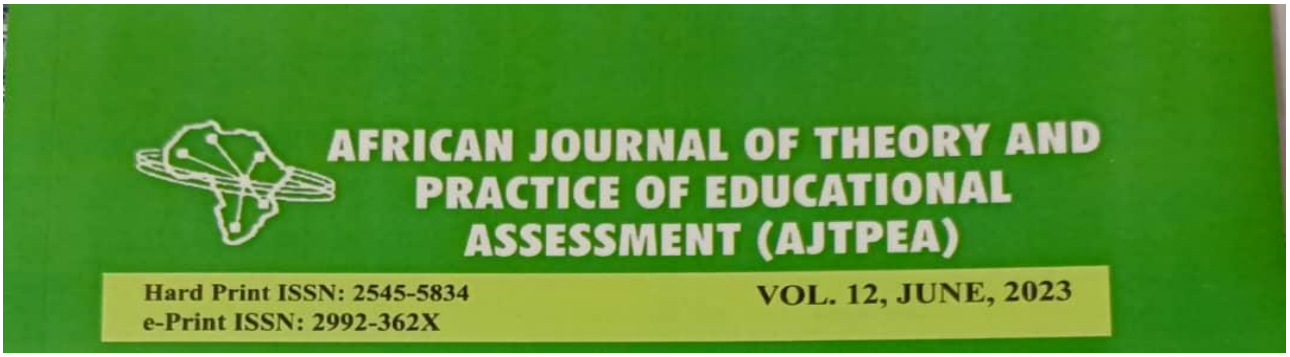

Assessing Teacher Educators' Perception of the Effectiveness of Multiple-Choice Questions on Students' Achievement in General Studies Courses

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Abstract

This paper examines teacher educators' perceptions of the effectiveness of Multiple-Choice Questions (MCQs) as assessment tools in General Studies (GST) courses at Alvan Ikoku Federal College of Education, Owerri. The study utilized a survey methodology with a total population of 107 academic staff, comprising 79 females and 28 males, using a census sampling approach. Data were collected through the Teacher Educators' Assessment Perception on Effectiveness of MCQs in GST Courses (TAPEMGC) questionnaire, which demonstrated a reliability coefficient of 0.80 as determined by Cronbach's alpha. The data were analyzed using mean and standard deviation to address research questions, while a t-test was employed to test hypotheses at 0.05 level of significance. Findings revealed that teacher educators hold positive perceptions regarding the effectiveness of MCQs in GST courses, with both male and female lecturers recognizing MCQs as valuable assessment tools. Although slight variations in perceptions were noted across specific aspects of MCQs, the overall attitudes underscore their potential for enhancing assessment in teacher education. Recommendations include those educational institutions should develop training programmes specifically aimed at enhancing the construction of MCQs tailored to GST courses.

Keywords: Teacher educators, perceptions, effectiveness, multiple-choice questions, general studies

Introduction

Assessment in education serves as a fundamental pillar, shaping the learning process and providing critical insights into students' understanding and knowledge acquisition. It plays a pivotal role in evaluating the effectiveness of teaching methods, guiding instructional decisions, and enhancing the overall learning experience. In the context of General Studies (GST) courses, where interdisciplinary knowledge is paramount, assessment methods must accurately gauge students' comprehension and skills across diverse subjects.

Assessment provides valuable feedback to both educators and students, with formative assessments offering real-time insights into students' learning progress. By understanding students' strengths and weaknesses through assessments, educators can adapt their teaching methods and address specific challenges within the interdisciplinary framework of GST courses (Black & Wiliam, 2018). Given the wide array of subjects covered in GST courses, assessing multidisciplinary competence is crucial. Methods such as Multiple-Choice Questions (MCQs) allow educators to evaluate students' ability to synthesize knowledge from different fields, nurturing well-rounded professionals capable of integrating knowledge across diverse disciplines (Gikandi, Morrow, & Davis, 2021).

When well-constructed, MCQs provide objectivity in assessment, ensuring fairness and equal opportunity for all students. Properly designed MCQs can minimize biases and create an equitable assessment platform, particularly in GST courses where students come from varied academic backgrounds (Haladyna & Rodriguez, 2017). Additionally, MCQs enable efficient evaluation of large student populations within a relatively short time frame. This efficiency is particularly valuable in GST courses, aiding educators in timely interventions and support for struggling students.

In higher education, various assessment methods are utilized to evaluate students' knowledge, skills, and understanding of the subject matter. MCQs have emerged as a popular and versatile assessment tool due to their efficiency, objectivity, and capacity to assess a wide range of content. Understanding the effectiveness of MCQs in GST courses is crucial, as they allow educators to efficiently assess a large volume of content. Given the diversity of topics in GST courses, MCQs can encompass a broad range of subjects in a single assessment, providing scalability within a busy academic schedule (Haladyna & Downing, 2018).

Moreover, MCQs can be designed to have clear and unambiguous correct answers, ensuring objective evaluation—a vital aspect in GST courses where subjective biases might affect assessment outcomes. This objectivity promotes equity in evaluation (Tarrant & Ware, 2021). Well-constructed MCQs can assess not only factual recall but also higher-order cognitive skills such as analysis, synthesis, and application of knowledge. By crafting questions that require critical thinking, educators can

evaluate students' ability to integrate concepts from various GST disciplines, offering a comprehensive assessment of their interdisciplinary understanding (Rodriguez, 2015).

MCQ assessments also provide immediate feedback to both educators and students. This rapid feedback enables educators to identify areas of confusion and adjust their teaching methods accordingly. In GST courses, this adaptability is crucial, allowing educators to refine their teaching strategies based on real-time assessment data. Insights from cognitive load theory further enhance understanding of these dynamics (Gibbs & Simpson, 2020).

Cognitive Load Theory (CLT) offers valuable insights into the design of effective assessments, including Multiple Choice Questions (MCQs). In exploring teacher educators' perceptions of MCQ effectiveness in General Studies (GST) courses, understanding CLT principles is essential for creating assessments that align with students' cognitive capacities. According to CLT, learners possess limited cognitive resources, and extraneous cognitive load—often caused by poorly designed tasks—can hinder learning (Sweller, 2018). Well-constructed MCQs that minimize irrelevant information and focus on essential concepts help reduce cognitive load. Teacher educators who are aware of these principles can design MCQs in GST courses that encourage students to concentrate on interdisciplinary connections rather than unnecessary details, thereby enhancing the validity of assessments (Sweller, van Merriënboer, & Paas, 2018).

Furthermore, worked examples that align with GST content serve as cognitive scaffolds, guiding students through problem-solving processes (Renkl, 2019). Integrating MCQs based on these examples allow teacher educators to assess students' ability to apply interdisciplinary knowledge effectively. By emphasizing problem-solving methods, MCQs can evaluate students' understanding of strategies across various GST disciplines (Renkl, 2019).

Numerous studies have investigated the effectiveness of Multiple-Choice Questions (MCQs) as assessment tools in higher education. These studies provide valuable insights into the advantages and challenges associated with MCQs, forming a foundation for understanding their applicability in diverse academic contexts, including General Studies (GST) courses. Research by Smith and Johnson (2017) demonstrated that well-constructed MCQs can promote active learning and enhance students' understanding of complex concepts. The immediate feedback provided by MCQs reinforces correct answers and addresses misconceptions, leading to improved learning outcomes (Smith & Johnson, 2017).

Additionally, Thompson et al. (2015) emphasized the reliability of MCQs in large-scale assessments. Properly validated MCQs yield consistent results, ensuring fairness in evaluations. Their research highlighted the potential of MCQs to assess a wide range of content, making them particularly suitable for interdisciplinary courses such as GST (Thompson et al., 2015). Brown and Davis (2018) underscored the importance of aligning MCQs with course learning objectives. When MCQs are closely tied to the intended outcomes of the curriculum, they provide a valid measure of

students' mastery of interdisciplinary knowledge, enhancing their value in GST education (Brown & Davis, 2018).

Conversely, Chen et al. (2019) identified challenges associated with MCQ assessments, including the potential for guesswork and the necessity for careful question construction. These challenges, particularly within diverse GST courses, underscore the importance of addressing limitations to ensure accurate assessment of students' interdisciplinary skills (Chen et al., 2019). In this study, the concept of "sex" refers to the biological and physiological differences between male and female teacher educators. Understanding these differences is crucial, as they may influence educators' perceptions and attitudes toward assessment methods, including Multiple-Choice Questions (MCQs).

Research indicates that male and female educators may approach teaching and assessment differently, which can shape their views on the effectiveness of MCQs in evaluating student achievement. For instance, some studies suggest that female educators may prioritize holistic teaching strategies that emphasize deep understanding and critical thinking, while male educators may lean towards quantifiable measures of assessment, such as MCQs, that efficiently cover a broad range of content (Scouller, 1998).

In our study, we observed that both male and female educators recognized the strengths of MCQs in terms of their efficiency and objectivity. However, there were notable differences in how each group perceived the potential drawbacks of MCQs. Male educators tended to appreciate the ease of scoring and the ability to assess a wide array of topics quickly, aligning with their preference for structured assessments. In contrast, female educators expressed greater concern about the limitations of MCQs, particularly their propensity to promote surface learning and memorization rather than encouraging critical thinking and deep understanding (Simkin & Kuechler, 2005).

By examining these differing perceptions, the study highlights the importance of considering sex as a significant factor in educational research. Understanding how male and female educators perceive the effectiveness of MCQs can inform the design of assessment tools that not only cover content efficiently but also foster critical thinking and deeper learning. This nuanced approach can contribute to more equitable and effective assessment strategies in General Studies (GST) courses, ultimately enhancing student outcomes. The perception of the effectiveness of multiple-choice questions can also be influenced by the sex of the teacher. Some studies suggest that male and female educators may have different teaching styles and assessment preferences, which could influence their views on multiple-choice questions (Bolton, 2010).

While there have been extensive studies exploring the effectiveness of Multiple-Choice Questions (MCQs) in higher education, there are notable gaps in the existing literature, especially concerning the perceptions of teacher educators in the context of General Studies (GST) courses. Most previous studies primarily focus on students' performance and perceptions regarding MCQ assessments (Smith & Johnson, 2017).

There is a notable absence of research specifically delving into the perceptions of teacher educators who design and implement assessments, especially in interdisciplinary fields like GST. Understanding their insights is crucial for refining assessment methods that align with the multidisciplinary nature of GST courses. Previous studies often overlook the pedagogical implications of using MCQs in GST courses. Understanding how teacher educators perceive the pedagogical impact of MCQs in shaping students' interdisciplinary skills is essential (Chen et al., 2019). Gaining insights into their teaching strategies and preferences concerning MCQs can bridge the gap between assessment practices and pedagogical goals in GST education. It is on this note that the researchers assess teacher educators' perception of the effectiveness of multiple-choice questions in assessing students' achievement in General Studies (GST) courses.

The primary purpose of this study is to determine teacher educators' perceptions of the effectiveness of Multiple-Choice Questions (MCQs) in assessing students' achievement in General Studies (GST) courses. Additionally, the study aims to explore whether sex influences teacher educators' perceptions regarding the effectiveness of MCQs in this context.

Research questions

1. What is the perception of teacher educators' of the effectiveness of multiple-choice questions in assessing students' achievement in General Studies (GST) courses?
2. What is the influence of Sex on teacher educators' perception of the effectiveness of multiple-choice questions in assessing students' achievement in General Studies (GST) courses?

The hypothesis tested in this study was:

Ho_1: There is no significant difference in the mean responses of male and female teacher educators' perception of the effectiveness of multiple-choice questions in assessing students' achievement in General Studies (GST) courses.

Methods

A survey design was employed for this study, aiming to gather information from respondents as the situation exists without manipulating any variables (Eke, 2018). The research was conducted at the School of General Studies Education, Alvan Ikoku College of Education, Owerri (AIFCE). The population for the study consisted of 107 academic staff members, comprising 79 males and 28 females. Given the small size of the population, the entire academic staff was included as the sample.

The instrument used for data collection was the Teacher Assessment Perception of the Effectiveness of MCQs in GST Courses (TAPEMGC). This instrument comprised two parts: Part One collected demographic information from respondents, while Part Two consisted of sections A and B, which sought information on teacher assessments regarding the effectiveness of MCQs in GST courses. A four-point rating

scale was utilized, including categories of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD).

The TAPEMGC instrument underwent face validation by three experts in Educational Psychology and Measurement and Evaluation at Alvan Ikoku College of Education. Their feedback contributed to the final version of the instrument used in the study. Additionally, the instrument was pilot tested for reliability using Cronbach's alpha with a sample of 36 lecturers outside the study population, resulting in a reliability coefficient of 0.80. The instrument was administered to the respondents with the assistance of two trained research assistants, ensuring a 100% return rate. Data were analyzed using mean and standard deviation to answer the research questions, with a decision rule stating that any mean score of 2.50 or above would be accepted, while scores below 2.50 would be rejected. The t-test statistic was employed to test the hypothesis at a 0.05 level of significance.

Table 1: Teacher Educators' Perception of the Effectiveness of MCQs as Assessment Tool in GST Courses

Item Statement	Lecturers	Decision
1. MCQs efficiently assess a wide range of content in GST courses.	2.34	Reject
2. MCQs help evaluate students' ability to synthesize knowledge from different GST disciplines.	3.51	Accept
3. MCQs provide valuable feedback to educators on students' learning progress in GST courses.	3.46	Accept
4. MCQs are objective assessment tools, minimizing biases in evaluations.	3.44	Accept
5. MCQs promote fairness and equal opportunity for students from diverse academic backgrounds.	3.20	Accept
6. MCQs allow for efficient assessment of a large number of students within a short time frame.	3.31	Accept
7. MCQs assess not only factual recall but also higher-order cognitive skills in GST courses.	3.52	Accept
8. MCQs offer immediate feedback to both educators and students, aiding in timely interventions.	3.53	Accept

Item Statement	Lecturers	Decision
9. Well-constructed MCQs reduce cognitive load, allowing students to focus on interdisciplinary connections.	3.18	Accept
10. MCQs aligned with worked examples help assess students' ability to apply interdisciplinary knowledge.	2.66	Accept
11. MCQs enhance active learning and students' understanding of complex GST concepts.	2.31	Reject
12. The immediate feedback provided by MCQs reinforces correct answers and addresses misconceptions in GST courses.	3.40	Accept
13. MCQs offer consistent and reliable results in large-scale assessments in GST courses.	3.50	Accept
14. The alignment of MCQs with course learning objectives enhance their validity in assessing interdisciplinary knowledge in GST courses.	3.41	Accept
15. There are challenges associated with MCQ assessments, such as guesswork and question construction, in diverse GST courses.	3.58	Accept
16. Teacher educators' perception of MCQs is influenced by their understanding of cognitive load theory in GST courses.	3.51	Accept
17. Pedagogical implications of MCQs in shaping students' interdisciplinary skills are essential in GST education.	3.21	Accept
18. Teacher educators' preferences regarding MCQs can bridge the gap between assessment practices and pedagogical goals in GST courses.	3.58	Accept
19. Teacher educators' perceptions of MCQs might vary based on their experience level in teaching GST courses.	3.05	Accept

Item Statement	Lecturers	Decision
20. MCQs can effectively assess multidisciplinary competence, but careful design is essential to overcome their limitations in GST courses.	3.58	Accept
Cluster Mean	**3.71**	
Average Mean Response	**3.17**	

Table 1 shows that each of the items has a mean score above 2.5, indicating acceptance by the respondents, except for Item 1, which has a low mean score of 2.34. This suggests that, on average, teacher educators disagreed with the statement that MCQs efficiently assess a wide range of content in GST courses. Additionally, Item 11, with a mean score of 2.31, signifies a disagreement among teacher educators regarding the ability of MCQs to enhance active learning and understanding of complex GST concepts.

Table 2: Influence of Sex on Teacher Educators' Perception of the Effectiveness of MCQs as Assessment Tools in GST Courses

ITEM STATEMENT	Male Lecturers	Remark	Female Lecturers	Remark
1. MCQs efficiently assess a wide range of content in GST courses.	2.11	Reject	2.20	Reject
2. MCQs help evaluate students' ability to synthesize knowledge from different GST disciplines.	3.10	Accept	3.12	Accept
3. MCQs provide valuable feedback to educators on students' learning progress in GST courses.	3.16	Accept	3.09	Accept
4. MCQs are objective assessment tools,	3.13	Accept	3.21	Accept

ITEM STATEMENT	Male Lecturers	Remark	Female Lecturers	Remark
minimizing biases in evaluations.				
5. MCQs promote fairness and equal opportunity for students from diverse academic backgrounds.	3.44	Accept	3.40	Accept
6. MCQs allow for efficient assessment of a large number of students within a short time frame.	3.50	Accept	3.52	Accept
7. MCQs assess not only factual recall but also higher-order cognitive skills in GST courses.	3.10	Accept	3.20	Accept
8. MCQs offer immediate feedback to both educators and students, aiding in timely interventions.	3.38	Accept	3.15	Accept
9. MCQs assess not only factual recall but also higher-order cognitive skills in GST courses.	3.01	Accept	3.17	Accept
10. MCQs aligned with worked examples help assess students' ability to apply interdisciplinary knowledge.	2.59	Accept	2.78	Accept
11. MCQs enhance active learning and students' understanding of complex GST concepts.	2.21	Reject	2.32	Reject

ITEM STATEMENT	Male Lecturers	Remark	Female Lecturers	Remark
12. The immediate feedback provided by MCQs reinforces correct answers and addresses misconceptions in GST courses.	3.52	Accept	3.48	Accept
13. MCQs offer consistent and reliable results in large-scale assessments in GST courses.	3.50	Accept	3.51	Accept
14. The alignment of MCQs with course learning objectives enhance their validity in assessing interdisciplinary knowledge in GST courses.	3.38	Accept	3.43	Accept
15. There are challenges associated with MCQ assessments, such as guesswork and question construction, in diverse GST courses.	3.57	Accept	3.51	Accept
16. Teacher educators' perception of MCQs is influenced by their understanding of cognitive load theory in GST courses.	3.51	Accept	3.50	Accept
17. Pedagogical implications of MCQs in shaping students' interdisciplinary skills are essential in GST education.	3.28	Accept	3.29	Accept

ITEM STATEMENT	Male Lecturers	Remark	Female Lecturers	Remark
18. Teacher educators' preferences regarding MCQs can bridge the gap between assessment practices and pedagogical goals in GST courses.	3.55	Accept	3.55	Accept
19. Teacher educators' perceptions of MCQs might vary based on their experience level in teaching GST courses.	3.09	Accept	3.14	Accept
20. MCQs can effectively assess multidisciplinary competence, but careful design is essential to overcome their limitations in GST courses.	3.51	Accept	3.49	Accept
Average Mean Response	**3.17**	Accept	**3.18**	Accept
Cluster Mean 3.75				

Table 2 shows that all items on the questionnaire were accepted by both male and female lecturers, as their response means (all greater than 2.50) exceeded the instrument scale mean. The only exceptions were Item 1 and Item 11, which were rejected by both male and female lecturers, with mean scores below the threshold of 2.50. This indicates a consensus among educators regarding the limitations of MCQs in efficiently assessing a wide range of content and enhancing active learning in GST courses.

Table 3: T-Test Analysis of Mean Responses of Male and Female Teacher Educators' Perception of the Effectiveness of MCQs as Assessment Tools in GST Courses

Sex	N	Mean	SD	DF	t-cal	p-value	Decision
Male	28	3.17	0.54	105	1.68	0.491	Accepted
Female	79	3.18	0.51				

The data presented in Table 3 indicate that the calculated t-value is 1.68, with 105 degrees of freedom and a p-value of 0.491. Since the p-value is greater than 0.05 at the 0.05 level of significance, we fail to reject the null hypothesis. This suggests that there is no significant difference in the mean responses of male and female teacher educators regarding the effectiveness of MCQs as assessment tools in GST courses.

Discussion of findings

This study aimed to investigate teacher educators' perceptions of the effectiveness of Multiple-Choice Questions (MCQs) as assessment tools in General Studies (GST) courses. The findings, summarized in the tables, reveal various aspects of teacher educators' attitudes toward MCQs in the context of GST education. From Table 1, several notable patterns emerge. Items 2, 3, 4, 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, 18, and 20 were accepted, indicating that teacher educators view MCQs as valuable tools for assessing a wide range of content. They believe MCQs effectively evaluate students' abilities, provide valuable feedback, ensure objectivity, promote fairness, allow for efficient assessments, assess higher-order cognitive skills, offer immediate feedback, reinforce correct answers, provide reliable results, align with course objectives, and assess multidisciplinary competence in GST courses. Conversely, items 1 and 11 were rejected, suggesting that teacher educators do not perceive MCQs as efficient in assessing a wide range of content or in enhancing active learning and understanding of complex GST concepts. The overall cluster mean of 3.71 indicates a generally positive perception of MCQs among teacher educators.

When comparing these findings with existing literature, several studies support the effectiveness of MCQs in various educational contexts. Research by Haladyna and Rodriguez (2017) reinforces the notion that well-constructed MCQs can effectively assess higher-order cognitive skills. Similarly, studies by Case (2008) and Tarrant et al. (2016) emphasize the significance of immediate feedback provided by MCQs in enhancing learning outcomes. These findings align with the positive perceptions expressed by teacher educators in this study regarding feedback and higher-order cognitive skills assessment through MCQs.

Furthermore, the rejection of item 1 aligns with concerns raised by researchers such as Downing (2015) about the limitations of MCQs in comprehensively assessing a wide range of content. This discrepancy highlights an area where further research and

improvement in MCQ design may be necessary, particularly to enhance their effectiveness in assessing complex concepts and fostering deeper learning.

In Table 2, the researchers examined the influence of sex on teacher educators' perceptions of the effectiveness of Multiple-Choice Questions (MCQs) as assessment tools in General Studies (GST) courses. Overall, the table indicates that both male and female lecturers generally perceive MCQs positively as effective assessment tools. Most items received mean scores above the midpoint of the scale, suggesting that both male and female lecturers find MCQs beneficial for assessing a wide range of content, evaluating students' abilities, providing feedback, promoting fairness, assessing cognitive skills, offering immediate feedback, and aligning with course objectives. These findings are consistent with previous research on the effectiveness of MCQs in assessment. Studies by Black & Wiliam (2018) and Smith and Johnson (2017) highlight the benefits of MCQs in providing objective assessments, efficient evaluations, and quick feedback. Additionally, research by Brown and Davis (2018) and Rodriguez (2015) emphasizes the importance of careful design in overcoming limitations associated with MCQ assessments.

Moreover, these findings align with broader literature on sex differences in teaching and assessment. Research by Sadler (2019) and Spelke (2015) suggest that subtle sex-related biases may exist in assessment practices, although these biases are not uniform across all contexts. The differences observed in perceptions of MCQs between male and female lecturers in this study could be influenced by various factors, including teaching experiences, educational backgrounds, and personal beliefs about effective teaching and assessment methods.

Table 3 indicated no significant difference in the mean responses of male and female teacher educators regarding their perceptions of the effectiveness of Multiple-Choice Questions (MCQs) as assessment tools in General Studies (GST) courses. This result suggests a consensus among both sexs on the value of MCQs, which may stem from shared teaching experiences, pedagogical training, and familiarity with assessment practices.

The lack of significant difference in perceptions can be attributed to several factors: both male and female educators likely have similar educational training and exposure to assessment techniques, leading to aligned views on the effectiveness of MCQs, both groups may have similar teaching experiences in GST courses, their perceptions may converge, as they encounter comparable challenges and benefits associated with MCQ assessments.

This study’s findings align with existing literature that suggests sex does not significantly influence perceptions of assessment tools. For example, research by Sadler (2019) indicates that while subtle biases may exist, they do not always manifest in significant differences in perceptions of assessment methods. Similarly, studies by Black & Wiliam (2018) and Smith and Johnson (2017) emphasize the objective advantages of MCQs, which may resonate similarly across sexs. In contrast, some studies have highlighted sex differences in teaching styles and assessment preferences.

However, the current research suggests that these differences may not necessarily extend to perceptions of specific assessment tools like MCQs, particularly in standardized educational contexts.

Conclusion

This study provides valuable insights into teacher educators' perceptions of the effectiveness of Multiple-Choice Questions (MCQs) as assessment tools in General Studies and Teaching (GST) courses. The findings indicate a strong consensus among educators regarding the overall effectiveness of MCQs, highlighting their role in providing objective and efficient assessments. Both male and female lecturers recognized MCQs as beneficial for evaluating a wide range of content and assessing students' cognitive abilities.

However, the study also identified slight differences in perceptions regarding specific aspects of MCQ effectiveness, such as their ability to assess complex concepts and promote active learning. These insights suggest that while MCQs are widely accepted, and there is room for improvement in their design and application.

From a practical standpoint, educational institutions should leverage these findings to enhance assessment strategies. By investing in targeted training for educators and fostering interdisciplinary collaboration, institutions can ensure that MCQs are well-constructed and aligned with the objectives of GST courses. This will not only improve the quality of assessments but also better support students' learning outcomes.

In summary, the study underscores the need for ongoing development and refinement of MCQ assessment practices, ensuring that they effectively meet the diverse needs of students in GST education.

Recommendations

1. Educational institutions should develop training programs specifically aimed at enhancing the construction of MCQs tailored to GST courses. Workshops should focus on aligning questions with course learning objectives and addressing the identified limitations in assessing a wide range of content. This training can help educators create more effective assessments.
2. Educators should engage in collaborative efforts across disciplines to ensure that MCQs reflect the interdisciplinary nature of GST courses. By working together, teachers can design questions that assess students’ abilities to synthesize knowledge from various fields, thereby improving the relevance and applicability of assessments.
3. Teacher educators should explore innovative approaches to MCQs that promote active learning. This might include the integration of scenario-based questions or

multimedia elements that encourage students to engage with the material more deeply. Training on these methods can enhance the effectiveness of assessments.

4. Institutions should implement a structured review process for MCQs used in assessments, ensuring their quality and alignment with educational goals. Involving peers and assessment experts in this review can help maintain standards. Additionally, collecting feedback from students regarding the clarity and effectiveness of MCQs can provide insights for continuous improvement.

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