

**COLLABORATIVE AND INNOVATIVE ASSESSMENT PRACTICES IN
TEACHER EDUCATION PROGRAMMES: USAGE AND CHALLENGES**

IFEOMA CLEMENTINA METU (Ph.D)

Evaluation, Research and Statistics Unit, Department of Educational Foundations,
Faculty of Education, NnamdiAzikiwe University, Awka-Anambra State, Nigeria.
Email: ic.metu@unizik.edu.ng; <https://orcid.org/0000-0003-2968-2853>

LYDIA IJEOMA ELEJE (Ph.D)

Evaluation, Research and Statistics Unit, Department of Educational Foundations,
Faculty of Education, Nnamdi Azikiwe University, Awka Anambra State, Nigeria
ijeomaexcite@gmail.com, li.eleje@unizik.edu.ng;
<http://orcid.org/0000-0002-8587-289X>

KALU EKE OSONWA (Ph.D)

Evaluation, Research and Statistics Unit, Department of Educational Foundations,
Faculty of Education, NnamdiAzikiwe University, Awka-Anambra State, Nigeria.
drkalueke@gmail.com; <https://orcid.org/0009-0004-2906-4427>

Corresponding Author: Dr Ifeoma Clementina Metu: 08029773661

Abstract

This study is set to investigate the usage of collaborative and innovative practices in teacher education programmes, and the perceived challenges associated with the usage. Five research questions directed the study. The survey design used was descriptive. Three hundred (300) undergraduates and 60 Postgraduate students from public universities in Anambra state served as the study's sample, made possible by the use of multi-stage sampling procedure. A self-administered, verified questionnaire titled “Collaborative and Innovative Assessment Practices in Teacher Education Programmes Questionnaire” (CIAPTEPQ) served as the data gathering tool. The questionnaire's internal consistency was assessed using the Cronbach alpha method. This yielded a reliability coefficient of 0.81. Data was analysed using descriptive statistics. The research issue was addressed, and the homogeneity of the respondents was ascertained using the mean and standard deviation. The findings revealed that innovative techniques like Self-assessment and reflection, Gamification and Simulation are not used in Anambra state higher institutions, but Online quizzes, Collaborative problem-solving and e-Portfolio are used most often It was recommended that faculty members and students should have a positive attitude towards embracing innovative assessment strategies by engaging in personal development to update their knowledge of technology-enhanced assessment devices.

Interesting findings were made and some suggestions for improvement were recommended.

Keywords: Assessment, Collaborative assessment, Innovative assessment, Teacher education programmes

Introduction

Teacher education programmes are educational programmes designed to prepare individuals to become efficient, professional and effective teachers. In Nigerian higher institutions there are several programmes designed for teacher education, ranging from Nigeria Certificate in Education (NCE), Bachelor's degree in education (B.Ed), and Postgraduate diploma in Education (PGDE). According to Mormah and Bassey (2021), teacher education programmes are programmes in which an individual must pass through some specific and specialized training through designated platforms and specialized programmes in order to become a teacher. The quality of teacher education programme is crucial in preparing effective teachers who can provide high-quality education to students. This may be why the national policy on education specified that the goal of teacher education in Nigeria includes, among others, the encouragement of the spirit of enquiry and creativity in teachers and providing them with the intellectual and professional background that will be adequate for their assignments and also make them adaptable to changing situations (FME, NPE, 2014). Besides these attributes as posited above, it is expedient that teacher education programmes should also produce individuals who can see, analyze, and interpret the needs and aspirations of citizens and the learners particularly in the classroom. It is worthy of note that one cannot separate teacher education and modes of assessment because of the crucial role assessment plays in education; tracking students' progress and designing educational programs.

Assessment practices play a vital role in teacher education programmes as they help to evaluate students' knowledge, skills, and competencies. Moreover, assessment

serves as a powerful tool to measure students' learning; inform instruction; promote academic achievement; evaluate programme effectiveness. Assessment is also used for accountability and accreditation; identifying learning gaps, and development of critical thinking and problem-solving skills. However, traditional assessment methods have been criticized for being limited in their ability to capture the complexities of teaching practice, critical thinking, and collaborative skills necessary for effective teaching (Li *et al.*, 2024; Marangio *et al.*, 2024; Meylani, 2023). As a result, there has been a growing shift towards innovative and collaborative assessment practices that better align with contemporary educational needs (Care *et al.*, 2018; Meng, 2023; Sliwka, 2024; Tan *et al.*, 2021). Students must be prepared with the knowledge and skills needed for the 21st century because current and future jobs require work with expert thinking or complex communication skills and interpersonal cooperative skills (Garcia-Perez *et al.*, 2021; Short & Keller-Bell, 2021; Karaca-Atik *et al.*, 2023).

In recent years, there has been a growing interest in collaborative and innovative assessment practices in teacher education programs. Collaborative assessment refers to an approach to assessment that involves students, teachers, and sometimes peers, working together to set goals, monitor progress, and evaluate learning outcomes. Innovative assessment on the other hand involves the use of new creative, and effective methods to measure student learning and understanding. Both forms of assessment go beyond traditional multiple-choice tests and quizzes and focus on evaluating students' critical thinking, problem solving, and communication skills. The approaches prioritize active learning, and involve students in the assessment process through peer review, self-assessment, and reflection. Collaborative assessment practices involve interactive and participatory evaluation methods that engage students in peer assessment, group projects / assignments, and co-created rubrics (Gong, 2023; Morton *et al.*, 2023; Yan, 2024).

These approaches foster deeper learning, enhance critical reflection, and improve communication skills among future educators (Devaki, 2024; Dutta *et al.*, 2023). Innovative assessments, including digital or e-portfolio, simulation-based assessments, and competency –based evaluations are 21st century practices that provide authentic learning experiences and prepare pre-service teachers for real world classroom challenges.

The implementation of 21st century skills into the curriculum, however, requires that teachers be prepared. Studies indicate that teachers are aware of the 21st century teaching and learning concepts (Clarke, 2014; Kurata, 2023), and they think that these skills are essential since teachers prioritize the skills of creativity and innovation, critical thinking and problem solving, collaboration, and communication (4Cs) (Haryani *et al.*, 2019; Ningsih & Jha, 2021). Collaboration can be seen as merging cooperation with coordination (Castaner & Oliveira, 2020; Vivona *et al.*, 2023). In general, an institution gets involved in collaboration with others in order to attain more resources and, at the same time, achieve its own objectives and interests (Tseng *et al.* 2020; Dias and Selan 2023). Such collaboration with common interests causes those involved to become more innovative since, through this procedure, they will be able to learn from each other (Martínez-Costa *et al.* 2019; Demircioglu *et al.*, 2023; Tseng *et al.* 2020). As a result, collaboration has a close relation with innovation, especially in cases where a programme or institution holds common interests, goals, and values (van der Voet & Steijn 2021). In the case of teacher education programme, the common goal is to improve on the learning outcomes of the students through critical thinking, problem-solving, and creativity skills. These are achieved by making students to be more engaged in their studies.

Furthermore, based on technological advancements, the teaching and learning processes have gradually witnessed a transition from the traditional teacher-dominated

classrooms to the all-inclusive setting. The outcome of the traditional school is a widening gap between the knowledge, skills students are acquiring in schools and the knowledge and skills needed to succeed in the increasingly global, technology infused 21st century workplace. While current assessment measures knowledge of core content areas such as language arts, mathematics, science and social studies, there is a comparative lack of assessments and analyses focused on 21st century skills (Oluchi, 2018). In recent times, students do not fully rely on their teachers for instruction. The presence of digital technology has affected the teaching and learning situation. Lecture notes, study materials, learning resources among others are readily available online. Students can also form study groups over the internet, since distance is no longer a barrier to learning. The emergence of new technologies has been revolutionary by giving people more access, choice and power (Oluchi, 2018). This study therefore investigates the usage of collaborative and innovative educational assessment practices in teacher education programmes in Anambra tertiary institutions, specifically examining the extent of use and the challenges involved. Despite the fact that collaborative and innovative assessments have many benefits, the implementation in higher education especially in Nigeria seems somehow lopsided.

Statement of the Problem

Assessment plays a crucial role in teacher education programmes, shaping the learning experiences of pre-service teachers and ensuring their readiness for the profession. Traditional assessment methods, such as standardized tests and written examinations, have long been the dominant approach. However, there is growing recognition of the need for more collaborative and innovative assessment practices that promote deeper learning, critical thinking, and practical teaching competencies. These

approaches include peer assessment, self-assessment, portfolio-based assessment, and technology-enhanced assessments.

Despite their potential benefits, the adoption of collaborative and innovative assessment practices in teacher education programmes faces significant challenges. Many teacher educators and institutions struggle with issues such as lack of familiarity with alternative assessment methods, resistance to change, and the need for additional resources and training. This study seeks to explore the extent to which collaborative and innovative assessment practices are used in teacher education programmes in public universities in Anambra state of Nigeria, as well as the challenges that may hinder their effective implementation.

Literature Review

Studies have shown that collaborative assessment practices can lead to improved student engagement, enhanced teacher professional development, and more accurate measurement of student learning (Khatter *et al.*, 2024). Additionally, collaborative assessment encourages teachers to share ideas, provide feedback, and learn from each other. Innovative assessment practices, such as technology-enhanced assessment, authentic assessment, and self-assessment, have been found to promote deeper learning, critical thinking, and problem-solving skills (Bingham, 2024). These approaches also encourage teachers to think creatively and develop innovative teaching practices.

In spite of the benefits, implementing collaborative and innovative assessment practices can be challenging. Teachers may resist changes to traditional assessment methods, and institutions may face challenges in providing the necessary resources and support (Mesuwine & Mokoena, 2024; Sharma, 2025). Ensuring the validity and reliability of these assessments is also crucial. Research has also identified several factors that influence innovative behaviour among teachers, including organizational innovation

climate, teacher education and professional development, and collaboration and feedback (Zainal & Matore, 2019). When these factors are understood, they can help educators create an environment that supports collaborative and innovative teaching practices. This study is set to find out extent of use of collaborative and innovative assessment practices in teacher education programmes and the challenges in the implementation.

Research Questions

1. What are the collaborative and Innovative assessment practices used in your institution?
2. How often are collaborative and innovative assessment practices used in your institution?
3. How have collaborative and innovative assessments enhanced your teaching practices in your institution?
4. What aspects of collaborative and innovative assessment practices motivate and engage students more in your programme?
5. From your perspective as students, what are the challenges of using collaborative and innovative assessments in teacher education programmes?

Methods

This paper which adopted descriptive survey research design was anchored on five research questions. The population of the study comprised undergraduate and postgraduate students from public universities in Anambra state. The sample of the study consisted of 300 undergraduates and 60 postgraduate consenting students drawn at random from Nnamdi Azikiwe University, Awka (NAU) and Chukwuemeka Odumegwu Ojukwu University, Igbariam (COOU). The researchers designed an instrument titled “Collaborative and Innovative Assessment Practices in Teacher Education Programmes

Questionnaire” (CIAPTEPQ) which was used to elicit information from the respondents. The instrument consists of five clusters. A (10- items) on the types of collaborative and innovative assessment practices used in your programme. B (10- items) on frequency of use of the assessment practices. C (6-items) on how collaborative and innovative assessments enhance teaching practices. D (5- items) on aspects of collaborative and innovative practices that motivate and engage students and, E (9- items) on challenges of using collaborative and innovative assessments in teacher education programmes from students’ perspective. For Cluster A and D, “Yes” or “No” format was used to elicit responses. For cluster B, “frequently”, “occasionally”, and “rarely” were used to elicit information while in clusters C and E “Strongly agree” (SA), “Agree” (A), “Neutral” (N), “Disagree” (D), and “Strongly disagree” (SD) were the rating scale options. On method of data analysis, for cluster A and D, the mean benchmark for “Yes” is “0.5 and above”. Any mean score below “0.5” was taken as a “No”. For cluster B, the mean score for “Frequently” is “2.5” and above, “1.5” to “2.49” is taken as “Occasionally”, while any mean score below “1.5” is taken as “Rarely”. For cluster C and E, the mean benchmark is “3.00”. Any mean score from “3.00” to “5.00” is regarded as “Agreed” while the mean scores below “3.00” are taken as “Disagreed”.

Face and content validity of the instrument was guaranteed using professionals in department of Technology and Vocational Education, and Educational Foundations, Faculty of Education, Nnamdi Azikiwe University Awka, and Chukwemeka Odumegwu Ojukwu University, Igbariam Nigeria. The experts were requested to constructively examine the instrument in terms of appropriateness, wording, suitability of items and content coverage. Their inputs were used in modifying the items which was finally used for data collection. The reliability of the instrument was established using Cronbach Alpha method which yielded a coefficient value of 0.78. This index was adjudged

adequate for the study. The researchers employed the assistance of colleagues from the sampled institutions for the administration and retrieval of the questionnaires. This was necessary because of the relatively large number of respondents used in the study. Descriptive statistics (mean and standard deviation) was used to answer the research questions.

Results

Research Question One: What are the collaborative and Innovative assessment practices used in your programme?

Table 1: Collaborative and Innovative Assessment Practices used in Teacher Education Programmes for Undergraduate and Postgraduate Programmes

SN	ITEM	UNDERGRAD X	PG X
1	Peer assessment and feedback	.53	.83
2	Group project	.81	.88
3	Collaborative problem-solving	.87	.85
4	Self-assessment and Reflection	.16	.46
5	Online Quizzes and Exams	.91	.89
6	Simulation	.16	.03
7	Gamification (game-based) assessment	.24	.20
8	Authentic-based assessment	.35	.27
9	Competency-based assessment	.62	.71
10	Portfolio and Exhibition	.87	.82

Table 1 shows the collaborative and innovative assessment practices used in teacher education programmes in the higher institutions. From the table only 6 collaborative and innovative assessment strategies are used in the higher institutions for both undergraduate and postgraduate teacher education programmes because the means

are greater than the 0.5 benchmark. The strategies are “Peer assessment and feedback”, “Group project”, “Collaborative problem-solving”, “Online-quizzes and exams”, “Competency-based assessment” and, “e-Portfolio and Exhibition”. The assessment strategy with the highest mean for both groups is “online quizzes and exams”. This maybe because most of the faculty wide exams are taken as computer-based tests (CBT). The strategy with the least mean is “Simulation”. It is interesting to find out that it was the least mean for both undergraduate and postgraduate groups.

Research Question Two: How often are these assessment practices used in your programme?

Table 2: Frequency of use of collaborative and innovative assessment practices in programmes

SN	ITEM	UNDERGRD X	PG X
1	Peer assessment	2.70	3.21
2	Group project	2.58	2.81
3	Collaborative problem solving	2.64	2.72
4	Self-assessment	1.16	1.10
5	Online Quizzes and Exams	2.73	2.79
6	Simulation	1.31	1.31
7	Gamification (game-based) assessment	1.48	1.25
8	Authentic-based assessment	1.30	1.23
9	Competency-based assessment	2.12	2.26
10	e-Portfolio and Exhibition	2.62	2.75

Table 2 revealed the frequency of use of the different types of assessment practices. From the data collected, peer assessment, group project. Collaborative problem solving, online quizzes and exams, and e-portfolio and exhibition, with mean scores of 2.70, 2.58, 2.64, 2.73, and 2.62 respectively, are the assessment strategies that are frequently used for undergraduates in the institutions. The same set of assessment strategies were also frequently used for postgraduate teacher education teachers with mean of 3.21 (peer

assessment), 2.81 (Group project), 2.64 (collaborative problem-solving), 2.79 (online quizzes and exams), and 2.62 (e-portfolio and exhibition). The result also revealed that competency-based assessment was occasionally used as assessment strategy while the rest (self-assessment, simulation, gamification and authentic-based learning were rarely used. The strategy with the highest mean for undergraduates was “Online quizzes and exams”: 2.73, while “Peer assessment” has the highest mean (3.21) for postgraduates.

Research Question Three: How have collaborative and innovative assessments enhanced your teaching practices?

Table 3: Influence of Collaborative and Innovative assessments on teaching practices

SN	ITEM	UNDERGRD X	SD	PG X	SD
1	They improve my lesson planning and delivery	3.65	.44	3.60	.41
2	They enhance classroom management and organization	3.45	.52	3.15	.57
3	They increase students’ engagement and motivation	3.84	.49	3.79	.47
4	They help to develop critical thinking skills	3.93	.43	3.95	.44
5	They help to develop problem-solving skills	3.66	.47	3.61	.46
6	They help to improve assessment and evaluation strategies	3.81	.41	3.72	.45
Grand mean		3.67	.47	3.64	.46

From Table 3, all the items have their means above 3.00 which is the benchmark mean for items for collaborative and innovative assessment strategies that enhance teaching practices. From the grand mean of 3.67(undergraduates), and 3.64 (postgraduates), it shows that the student teachers strongly agree to the efficacy of the

assessment strategies. The low pooled standard deviation of 0.47 indicates that the convergence of the students' responses were not far from the mean and from each other.

Research Question Four: What aspects of collaborative and innovative assessment practices motivate and engage students?

Table 4: Aspects of collaborative and innovative practices that Motivate and Engage students

SN	ITEM	UNDERGRD X	PG X
1	Autonomy and choice	.66	.63
2	Opportunity for feedback	.71	.68
3	Opportunity for reflection	.82	.78
4	Collaboration and Teamwork	.89	.87
5	Real-world application	.69	.72

Table 4 above shows the aspects of collaborative and innovative assessment practices that motivate and engage students. The means from the various items were above the 0.5 benchmark which indicate that “Autonomy of choice”, “Opportunity for feedback”, “Opportunity for Reflection”, “Collaboration and Teamwork”, “Real-world application” are aspects of collaborative and innovative assessment practices that motivate and engage students both as undergraduates and postgraduates.

Research Question Five: From your perspective as students, what are the challenges of using collaborative and innovative assessments in teacher education programmes?

Table 5: Challenges of using collaborative/innovative assessments in teacher education programmes

SN	Item	Undergd X	PG X
1	Student / faculty resistance	3.93	3.83
2	Lack of self-awareness	3.70	3.98
3	Time consuming	3.96	4.21
4	Technical issues / glitches	4.20	4.38

5	Lack of equity and access for all students	3.82	3.80
6	Bias and Fairness in scoring	3.96	3.73
7	Teacher training and support needs	3.81	3.34
8	Difficulty in navigating technology-enhanced assessments	3.07	3.10
9	Limited technological resources (lack of funds)	4.13	4.20

The above table displays data that was used to find out from students' perspectives, the challenges of using collaborative and innovative assessments in teacher education programmes. From the table, all the items listed, looking at their respective means, both for undergraduate and postgraduate education programme students' point of view are the challenges facing utilisation of collaborative and innovative assessments. The item with the highest mean is "Technical issues and Glitches", this is true for both undergraduates and postgraduate students: Undergraduates; "4.20" and Postgraduates; "4.38". It does not take rocket science to know that in Nigeria and particularly the southeast, there is epileptic power supply. This implies that the use of these assessment practices that involve electricity supply may be impaired by power failure, most of the time.

Discussion

The findings on the type of collaborative and innovative assessment strategies used in teacher education programmes revealed that only six collaborative and innovative assessment strategies are used for both undergraduate and postgraduate teacher education programmes. The strategies are "Peer assessment and feedback", "Group project", "Collaborative problem-solving", "Online-quizzes and exams", "Competency-based assessment" and "e-Portfolio and Exhibition". This somehow collaborate the works of Obunadike *et al*, (2012) about the innovative and collaborative assessment practices in technical education. According to their findings the practices used include individual assessment, group assessment, self-assessment and peer assessment. The assessment strategy with the highest mean for both groups is "online quizzes and exams". This may

<https://journals.unizik.edu.ng/jtese>

be because most schools conduct their examinations as CBT because of large population of students.

Furthermore, the findings revealed the frequency of use of the different types of assessment practices. From the data collected, peer assessment, group project, collaborative problem solving, online quizzes and exams, and e-portfolio and exhibition, are the assessment strategies that are frequently used both for undergraduates and postgraduates in the institutions. This is in line with Valtonen *et al.*, (2021) whose result showed that pre-service teachers attest that collaborative disposition and learning skills are rarely used. Metu *et al.*, (2024) also collaborated that many lecturers are of the opinion that it is nearly impossible to use self-assessment and peer assessment strategies where the lecturer-student ratio is high. This is also in consonance with Babu & Bargarhi (2020) who stated that large number of students hinder the use of collaborative and innovative assessment strategies.

The result also showed that the students agreed to the efficacy of collaborative and innovative assessment strategies in enhancing teaching practices, like improvement of lesson plan and delivery; enhancement of classroom management and organisation; increase in students' motivation and engagement; and development of critical thinking and problem-solving skills. This is both at undergraduate and postgraduate levels. This supports the result of the study by Warsah *et al.*, (2021) and Yacoob *et al.*, (2021) whose results showed that collaborative and innovative strategies have a positive and significant impact on critical and reflective thinking skills. The findings were also corroborated by the work of Egetin (2025) whose result revealed that classroom management strategies are fostered through collaborative leadership identity since it helps to create a participatory and engaging classroom environment.

The findings further revealed that collaborative and innovative assessment practices motivate and engage students. From the result it was shown that “Autonomy of choice”, “Opportunity for feedback”, “Opportunity for Reflection”, “Collaboration and Teamwork”, “Real-world application” are aspects of collaborative and innovative assessment practices that motivate and engage students both as undergraduates and postgraduates. Literature has reported consistent result on aspects of collaborative and innovative assessment practices that motivate and engage students. This may be why Devaki (2024) emphasised that innovative assessment enhances students’ engagement, critical thinking and other critical skills. His findings underscore the relationship between assessment practices and learning outcomes emphasising the need for educators to embrace innovative assessment practices. Still supporting the findings in this study, Ngema (2024) outlined major roles of collaborative and innovative assessment practices to include enhanced feedback, efficiency and scalability, and data-driven insights.

Furthermore, the findings revealed that from the undergraduate and postgraduate education programme students’ point of view the challenges facing utilisation of collaborative and innovative assessments include student/ faculty resistance; lack of awareness, time-consuming, technical issues / glitches, lack of equity and access for all students, bias and fairness in scoring, teacher training and support needs, difficulty in navigating technology-enhanced assessments, and, limited technological resources (lack of funds). The item with the highest mean is “Technical issues and Glitches”, this is true for both undergraduates and postgraduate students. It does not take rocket science to know that in Nigeria and particularly the southeast, establishments and households experience epileptic power supply. This implies that the use of these assessment practices that involve electricity supply may be impaired by power failure, most of the time. This result is in line with Amesi *et al.* (2022) whose findings revealed that when new

technologies are used in teaching and assessment, there is inadequate availability of facilities, epileptic power supply, poor internet network service, untrained personnel, and poor funding. According to Divayana *et al.*, (2021), and Dwiyanti and Suwastini, (2021), concerning teacher training and support needs for new technologies, teachers will be required to be more up to date with the teaching trends based on students' needs. They are not only required to update their pedagogical knowledge but also technological knowledge due to the development of technology used in assessing students. Teachers can explore more ways to give online assignments. In their research, Zhang *et al.* (2021) mentioned that the practices of online assessment train teachers to be adaptive and context-dependent. Teachers may undergo many plan changes to adjust to different assessment needs and to be ready for unexpected problems. Furthermore, Ngema (2024) also outlined technical issues, training and support needs, ethical and privacy concern, data management and privacy considerations as some of the challenges facing the use of collaborative and innovative assessment.

Conclusion

Based on the findings of this study, it was concluded that many of the collaborative and innovative assessment strategies like self-assessment and Reflection, Simulation, Gamification, and authentic-based assessment are not used in teacher education programmes in these institutions both at undergraduate and postgraduate levels. Furthermore, assessment strategies like Peer assessment, Group project, Online Quizzes and Exams, e-Portfolios and Exhibition are frequently used to teach at both levels of teacher education.

It was further concluded from the study that collaborative assessment strategies motivate and engage students to take control of their own learning. However, the use of

these strategies come with a lot of challenges ranging from technical glitches, unstable power supply, teacher training and support needs, lack of funds, among others.

Recommendation

Based on the findings it was recommended that:

1. Faculty members and students should have a positive attitude towards embracing innovative assessment strategies by engaging in personal development to update their knowledge of technology-enhanced assessment devices.
2. Government should provide more funds for workshops / seminars to update teachers on the essential skills and funds for provision of other technological resources to ensure steady power supply.

References

- Amesi, J., Igwe, O. E., & Nkoro, S. (2022). Improving the utilization of new technologies for the teaching of business education courses in Rivers and Bayelsa States Universities. *benchmarkjournals.com*
- Babu, A., & Barghathi, Y. (2020). Self-assessment and peer assessment in accounting education: Students and lecturers' perceptions [Special issue]. *Corporate Ownership & Control*, 17(4), 353-368. <http://doi.org/10.22495/cocv17i4siart12>
- Bingham, H. H. (2024). Practicing collaborative teaching with care: A literature review. *Update: Applications of Research in Music Education*, 87551233241278701.
- Care, E., Kim, H., Vista, A., & Anderson, K. (2018). Education system alignment for 21st century skills: Focus on assessment. *Center for Universal Education at The Brookings Institution*.

- Castañer, X., & Oliveira, N. (2020). Collaboration, coordination, and cooperation among organizations: Establishing the distinctive meanings of these terms through a systematic literature review. *Journal of management*, 46(6), 965-1001.
- Clarke, J. T. (2014). Twenty-First century teaching and learning: What do teachers know and what motivates them to change? (Doctoral dissertation, College of Saint Elizabeth).
- Demircioglu, M. A., Hameduddin, T., & Knox, C. (2023). Innovative work behaviors and networking across government. *International Review of Administrative Sciences*, 89(1), 145-164.
- Devaki, V. (2024). Exploring the impact of innovative assessment methods on learning outcomes: A review of project-based assessments, portfolios, peer assessment, and self-Assessment. *Policy Development, Curriculum Design, and Administration of Language Education*, 343-374.
- Dias, A., & Selan, B. (2023). How does university-industry collaboration relate to research resources and technical-scientific activities? An analysis at the laboratory level. *The Journal of Technology Transfer*, 48(1), 392-415.
- Divayana, D. G. H., Adiarta, A., & Suyasa, P. W. A. (2021). Development of material contents and online assessment based on the Sevima Edlink platform for online learning of program evaluation subject during Covid-19 pandemic in Indonesia. *Journal of Technology and Science Education (JOTSE)*, 11(2), 498–512. <https://doi.org/10.3926/jotse.1243>.
- Dutta, S., Zhang, Y., & Tsang, D. C. (2023). Enhancing students' engagement and learning through peer assessment in group projects. *Journal of Educational Research and Reviews*, 11(6), 93-104.

- Dwiyanti, K. E., & Suwastini, N. K. A. (2021). Assessment for writing skills in online learning. *Lingua Scientia*, 28(1), 8–19. <https://ejournal.undiksha.ac.id/index.php/JJBI/article/view/29069>.
- Egitim, S. (2025). Collaborative leadership in English language classrooms: Engaging learners in leaderful classroom practices and strategies. *International Journal of Leadership in Education*, 28(1), 32-52.
- Gong, H. (2023). The Impact of Co-creating Rubrics on Peer Assessment in Higher Education EFL Classes. *International Journal of New Developments in Education*, 5(23), 153-161.
- Haryani, E., Cobern, W. W., & Pleasants, B. A. (2019). Indonesia vocational high school science teachers' priorities regarding 21st Century Learning Skills in their science classrooms. *Journal of Research in Science, Mathematics and Technology Education*.
- Karaca-Atik, A., Meeuwisse, M., Gorgievski, M., & Smeets, G. (2023). Uncovering important 21st-century skills for sustainable career development of social sciences graduates: A systematic review. *Educational Research Review*, 39, 100528.
- Khatter, A., Thalaachawr, K., & Blyth, M. (2024). Student engagement and fostering ownership of learning. *Journal of Applied Learning and Teaching*, 7(1).
- Kurata, L. (2023). Perceived overload of LGCSE Religious Education syllabus: Challenges and solutions for effective learning in the 21st century. *AGPE the royal Gondwana research journal of history, science, economic, political and social science*, 4(6), 24-32. <http://www.agpegondwanajournal.co.in>

- Li, T., Ji, Y., & Zhan, Z. (2024). Expert or machine? Comparing the effect of pairing student teacher with in-service teacher and ChatGPT on their critical thinking, learning performance, and cognitive load in an integrated-STEM course. *Asia Pacific Journal of Education*, 44(1), 45-60.
- Marangio, K., Carpendale, J., Cooper, R., & Mansfield, J. (2024). Supporting the development of science pre-service teachers' creativity and critical thinking in secondary science initial teacher education. *Research in Science Education*, 54(1), 65-81.
- Martínez-Costa, M., Jiménez-Jiménez, D., & Dine Rabeh, H. A. (2019). The effect of organisational learning on interorganisational collaborations in innovation: an empirical study in SMEs. *Knowledge Management Research & Practice*, 17(2), 137-150.
- Meng, S. (2023). Enhancing teaching and learning: Aligning instructional practices with education quality standards. *Research and Advances in Education*, 2(7), 17-31.
- Mesuwini, J., & Mokoena, S. (2024). Exploring online teaching and learning challenges for the technical and vocational education and training lecturer. *Journal of Education and e-Learning Research*, 11(1), 193-202.
- Metu, I. C., Eleje, L. I., & Mbelede, N. G. (2024) Impact of self-assessment and peer assessment in Higher Education: Post-graduate students' and lecturers' perspectives. *International Journal of Studies in Education* 20, (1), 2024, 395-407.
- Meylani, R. (2023). A comparative analysis of traditional and modern approaches to assessment and evaluation in education. *Bati Anadolu Eğitim Bilimleri Dergisi*, 15(1), 520-555.
- Morton, J. K., Northcote, M., Kilgour, P., & Jackson, W. A. (2021). Sharing the construction of assessment rubrics with students: A Model for collaborative rubric construction. *Journal of University Teaching and Learning Practice*, 18(4), 1-15.

- Ngema, D. (2024). A critical review of the purposes and authenticity of e-assessment policies and practices. *Open Books and Proceedings*, 134-153.
- Ningsih, T., & Jha, G. K. (2021). Strengthening student competency in making social science learning Media, social science development courses. *Journal of Innovation in Educational and Cultural Research*. 2(1). 1-6.
- Obunadike, D., Joy, C., & Nnennaya, D. I. (2012). Towards innovative assessment practices in teacher education in Nigeria. 6643.
- Oluchi, A. H. (2018). 21st century assessment in Nigerian secondary schools through Digital Media. *Journal of Educational Assessment in Africa*. 13, 52 – 53.
- Sharma, G. S. D. G. (2025). Adapting curriculum design to foster inclusive education in diverse classrooms. *Siddhanta's International Journal of Educational Research*, 1(1), 57-76.
- Short, M. N., & Keller-Bell, Y. (2021). Essential skills for the 21st century workforce. In *Research anthology on developing critical thinking skills in students* (pp. 97-110). IGI Global Scientific Publishing.
- Sliwka, A., Klopsch, B., Beigel, J., & Tung, L. (2024). Transformational leadership for deeper learning: shaping innovative school practices for enhanced learning. *Journal of Educational Administration*, 62(1), 103-121.
- Tan, S. C., Chan, C., Bielaczyc, K., Ma, L., Scardamalia, M., & Bereiter, C. (2021). Knowledge building: Aligning education with needs for knowledge creation in the digital age. *Educational Technology Research and Development*, 69(4), 2243-2266.
- Tseng, F. C., Huang, M. H., & Chen, D. Z. (2020). Factors of university–industry collaboration affecting university innovation performance. *The Journal of Technology Transfer*, 45, 560-577.

- Valtonen, T., Hoang, N., Sointu, E., Näykki, P., Virtanen, A., Pöysä-Tarhonen, J., ... & Kukkonen, J. (2021). How pre-service teachers perceive their 21st-century skills and dispositions: A longitudinal perspective. *Computers in Human Behavior, 116*, 10
- Valverde-Berrocoso, J., Fernández-Sánchez, M. R., Revuelta Dominguez, F. I., & Sosa-Díaz, M. J. (2021). The educational integration of digital technologies preCovid-19: Lessons for teacher education. *PloS one, 16*(8), e0256283.
- Van der Voet, J., & Steijn, B. (2021). Team innovation through collaboration: How visionary leadership spurs innovation via team cohesion. *Public Management Review, 23*(9), 1275-1294.
- Vivona, R., Demircioglu, M. A., & Audretsch, D. B. (2023). The costs of collaborative innovation. *The Journal of Technology Transfer, 48*(3), 873-899.
- Warsah, I., Morganna, R., Uyun, M., Afandi, M., & Hamengkubuwono, H. (2021). The impact of collaborative learning on learners' critical thinking skills. *International Journal of Instruction, 14*(2), 443-460.
- Yaacob, A., Mohd Asraf, R., Hussain, R. M. R., & Ismail, S. N. (2020). Empowering learners' reflective thinking through collaborative reflective learning. *International Journal of Instruction*. <https://doi.org/10.29333/iji.2021.14143a>
- Yan, D. (2024). Rubric co-creation to promote quality, interactivity and uptake of peer feedback. *Assessment & Evaluation in Higher Education, 49*(8), 1017-1034.
- Zainal, M. A., & Matore, M. E. E. M. (2019). Factors influencing teachers' innovative behaviour: A systematic review. *Creative Education, 10*(12), 2869. [10.4236/ce.2019.1012213](https://doi.org/10.4236/ce.2019.1012213)
- Zhang, C., Yan, X., & Wang, J. (2021). EFL teachers' online assessment practices during the Covid-19 pandemic: Changes and mediating factors. *Asia-Pacific Education Researcher, 30*(6), 499–507. <https://doi.org/10.1007/s40299-021-00589-3>.