



Navigating the Portfolio Landscape: Examining Lecturers' and Students' Perspectives on Portfolio Assessment Practices

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This study examined the perceptions of lecturers and students regarding portfolio assessment practices, their overall attitudes towards this assessment method, and the alignment and divergence between their perceptions. Employing a survey research design, the study was conducted at the University of Education, Winneba, in the Central Region of Ghana, involving 52 final-year science education students and five of their lecturers. Students were selected using stratified random sampling, while lecturers were chosen purposefully. Data collection instruments comprised five-point Likert scale questionnaires administered to both groups, ranging from strongly disagree to strongly agree. Descriptive analysis, including mean, frequencies, and percentages, was utilised for data analysis. Results indicated that lecturers generally perceive a clear purpose for

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portfolio assessment practices (mean score = 4.20) and emphasise integrating them into every educational programme (mean score = 4.40), while students express lower levels of satisfaction with these aspects (mean scores = 2.15, 2.42, respectively). Additionally, lecturers exhibit moderate attitudes towards portfolio assessment (60.0%), while students predominantly demonstrate low attitudes (59.6%). Alignment between lecturers and students is evident in some areas, such as the importance of communicating objectives and providing feedback to students and the importance of this assessment in diagnosing students' strengths and weaknesses, but discrepancies arise regarding the guidance of students during the practices. The study concluded that understanding and addressing the differences in perceptions and attitudes between lecturers and students is crucial for promoting a shared understanding and acceptance of portfolio assessment practices. In order to close gaps and foster meaningful engagement, it is then recommended that institutions prioritise efforts to improve communication, collaboration, and support for both lecturers and students to enhance the effectiveness of portfolio assessment practices in higher education.

Keywords: Portfolio assessment practices; perceptions; attitudes; lecturers; students.

1. INTRODUCTION

Portfolio assessment has emerged as a valuable method for evaluating student learning and progress in educational settings [1,2]. Unlike traditional assessment methods that often rely on standardised tests and examinations [3, 4], portfolio assessment, as an alternate assessment [5,6,7], offers a multifaceted approach that emphasises the compilation and review of a curated collection of students' work over time, showcasing their efforts, growth, and achievements [4,8,9]. As such, the emergence of this assessment model can be attributed to the recognition of this method in providing a more holistic assessment of diverse skills, competencies, and knowledge acquired by students throughout a course or programme [3,4,8,10].

Portfolio assessment practices entail a systematic process of collecting, selecting, organising, and reflecting on student work samples to demonstrate progress and achievement towards learning goals and objectives [3,8,11]. The process involves students actively engaging in compiling their work to form a collection [4,8]. The collection, often referred to as a portfolio [12], typically includes a diverse range of artifacts such as essays, projects, presentations, artwork, and reflections [4,9]. These portfolios serve as dynamic repositories of student learning experiences and accomplishments, providing valuable insights into their growth and development over time [3] and mastery of learning outcomes across multiple contexts and experiences [8]. Comparing portfolio assessment with traditional assessment methods reveals significant differences and outcomes. While

traditional assessments often focus only on evaluating students' performance on distinct tasks or examinations, revealing their snapshot at a specific time [3,7,10], portfolio assessment emphasises integration of formative and summative assessment strategies [8] and allows for greater flexibility and personalisation, enabling students to exhibit their learning in a variety of formats and contexts for evaluation [3, 9, 13]. Sewell et al. [12] added that, in addition to test outcomes, portfolio assessment reveals comprehensive descriptions or illustrations of the student's activities and experiences.

Existing literature on portfolio assessment in education has explored various aspects of its implementation, including its benefits, challenges, and effectiveness. Studies have highlighted the positive impact of portfolio assessment on student learning outcomes, such as improved critical thinking skills, self-regulation, and motivation [6,13,14]. Furthermore, it has been shown that portfolio assessment promotes deeper understanding [15], fosters student engagement and ownership of learning [3,16], and provides opportunities for authentic assessment and reflection [4, 10]. Moreover, Kharbach [4], Ghoorchaei & Tavakoli [7], and Sewell et al. [12], highlight that the formative nature of portfolio assessment allows it to be used as a powerful tool for guiding instructional decision-making and fostering student growth through tracking and evaluating their progress over time.

Additionally, portfolio assessment practices have been shown through studies to significantly impact both students' and teachers' attitudes towards assessment and learning. For students, portfolio assessment fosters a positive attitude

towards assessment by providing opportunities for self-expression, creativity, and personalised learning [1,3,4,6,16]. Students appreciate the authenticity and relevance of portfolio assessment, as it allows them to showcase their learning in meaningful ways [15,17]. Similarly, teachers' attitudes towards assessment are often positively influenced by portfolio assessment practices. Teachers value the opportunity to engage in authentic assessment practices that promote student-centred learning, individualised feedback, and ongoing dialogue with students [1,9,16]. However, challenges such as workload management, assessment validity, standardisation of assessment criteria, and technology integration may hinder the successful implementation of portfolio assessment practices [3,4,9,12,13,18].

The interest in portfolio assessment is evident in the growing emphasis on its integration into teacher education programmes for pre-service teachers in Ghana [19] and beyond [2,18], as portfolio assessment is considered to be an invaluable tool for self-evaluation, teacher assessment, and professional development [3,20]. Recognising the importance of portfolio assessment in preparing future educators, teacher education programmes are increasingly incorporating portfolio assessment practices into their curricula. By engaging in portfolio assessment as part of their training, pre-service teachers gain valuable experience in curriculum development, effective lesson planning, and assessment design [19,20,21]. This experience helps to bridge the gap between theory and practice, equipping pre-service teachers with the necessary skills and competencies to effectively assess student learning in real-world educational settings [4]. This emphasis reflects a broader recognition of the value of portfolio assessment in fostering reflective practice, promoting lifelong learning, and preparing educators to meet the diverse needs of learners in today's educational landscape [3,22].

Despite the growing interest in portfolio assessment, there are still gaps in the literature that warrant further investigation. Firstly, some studies overlooked the crucial input of either students [9,19,22] or educators [1,13,17], resulting in an incomplete understanding of portfolio assessment practices. Both stakeholders play essential roles in the assessment process, and their perspectives are necessary to provide a comprehensive view of portfolio implementation. Secondly, while some

studies highlight positive attitudes towards portfolio assessment among students [16,23,24] and teachers/lecturers [11,22,25], others report mixed or negative attitudes [9,11,15]. The presence of mixed attitudes among teachers and students towards portfolio assessment calls for an inquiry. Conflicting attitudes or a lack of understanding of the primary attitudes of teachers and students towards portfolio assessment pose challenges for effective implementation. Therefore, there is a need for study to clarify the attitudes of teachers and students towards portfolio assessment, enable appropriate measures to be taken to address concerns, and optimise its effectiveness [26]. Thirdly, there is a notable gap in examining the alignment and divergence of perceptions between teachers and students regarding portfolio assessment practices. Investigating how these stakeholders perceive the purpose, benefits, challenges, and effectiveness of portfolio assessment can provide insights into areas of consensus and potential areas for improvement.

Therefore, this study, conducted at the University of Education, Winneba, in the Central Region of Ghana, involving final-year students pursuing various Bachelor of Science (BSc.) Science Education programmes and their lecturers, aimed to explore the perspectives of these stakeholders regarding portfolio assessment practices. In particular, the students were allowed to build portfolios containing curriculum vitae, teaching notes, teaching-learning resources, reflections from classroom experience, a statement of teaching philosophy, mentor's and supervisor's assessment comments, test items with marking schemes, a lesson plan, copies of marked students' work books, and other evidence of student learning from their internship (teaching practice) programmes, allowing them to showcase their development as future educators. By investigating the perceptions of both lecturers and students regarding this assessment method and their impact on overall attitudes towards portfolio assessment, this study contributes to the ongoing discourse on the effectiveness of this assessment practice in science education. Specifically, the objectives of the study were: to explore the perceptions of lecturers and students regarding portfolio assessment practices; to examine the overall attitudes of lecturers and students towards portfolio assessment caused by their perceptions; and to investigate the alignment and divergence between the

perceptions of lecturers and students concerning portfolio assessment practices.

This study holds significant importance as it addresses an essential aspect of educational assessment by examining portfolio assessment practices from the perspectives of both lecturers and students. By uncovering the perceptions and attitudes of these stakeholders, the study provides insights that can inform the refinement and improvement of portfolio assessment processes in educational settings. Additionally, by exploring potential discrepancies or areas of agreement between lecturers and students, the study contributes to enhancing collaboration and communication in the assessment process. By addressing these aims, this study contributes to the existing literature on portfolio assessment. Overall, the findings of this study have the potential to inform pedagogical practices and promote effective assessment strategies in education.

1.1 Research Questions

The study sought answers to the following questions:

1. What are the perceptions of the lecturers and students regarding portfolio assessment practices?
2. What are the overall attitudes of the lecturers and students toward this assessment method?
3. In what ways do the perceptions of lecturers and students align and differ concerning portfolio assessment practices?

2. LITERATURE REVIEW

This section reviews related literature to areas concerned with the study involving portfolio assessment practices, students' perceptions and attitudes, teachers' perceptions and attitudes, and a conceptual framework examining the linkage between these variables.

2.1 Portfolio Assessment Practices

Portfolio assessment practices encompass a comprehensive and dynamic approach to evaluating student learning and progress, characterised by the purposeful compilation and collection of student work over time [3,4,8,12].

The assessment practices, generally involving key components including the collection of artifacts, reflection and self-assessment, and feedback and evaluation [3,12,18]. At their core, portfolio assessment practices emphasise the integration various assessment strategies, allowing students to actively engage in the assessment process and take ownership of their learning. As such, peer and teacher feedback is a crucial component of portfolio assessment procedures, giving students the chance to reflect on, develop, and improve their work [8,10,14]. Researchers have explored various aspects of portfolio implementation, including portfolio design, assessment criteria, feedback mechanisms, and integration with curriculum objectives. For example, Hanifa [14] discusses the importance of aligning portfolio assessment practices with clear learning objectives and providing students with opportunities for self-assessment and feedback through guidance. Furthermore, on portfolio implementation, Powell [2] stated that, as a tool for reflective learning in initial teacher education, portfolios have been used and analysed in higher education. Additionally, studies by Bangalan & Hipona [5], Muin & Hafidah [6], and Chang and Tseng [27] emphasise the role of technology in portfolio assessment, highlighting the potential of digital portfolios to enhance organisation, accessibility, and multimedia integration, leading to improved students' learning outcomes and attitudes.

2.2 Students' Perceptions towards Portfolio Assessment Practices

Portfolio assessment is a widely used method in education for evaluating student learning and promoting reflective practice [15]. Research by Davis et al. [15], Hayatdavoudi & Ansari [28], and AlRadini [29], highlighted the benefits of portfolio assessment in fostering students' reflective skills, which are essential for deepening learning and promoting metacognition. However, despite its potential benefits, students' perceptions toward portfolio assessment practices may vary, influencing their engagement and satisfaction with the process. Several studies have explored students' perceptions of portfolio assessment, revealing mixed findings. For example, Davis et al. [15] and Salah EIDin et al. [17] found that while some students appreciated the opportunity for self-reflection and showcasing their work through portfolios, others expressed concerns about the time and effort required to compile and maintain them. Similarly, Schrempf et al. [30] and Salah EIDin et al. [17] reported that students

valued the authentic assessment opportunities provided by portfolios but struggled with understanding the assessment criteria and expectations.

2.3 Students' Attitudes towards Portfolio Assessment Practices

Students' attitudes toward portfolio assessment practices play a crucial role in their acceptance and engagement. Research by Nungari [11], Suwaed [13], and Schrempf et al. [30] demonstrated that students' positive attitudes toward portfolio assessment were associated with higher levels of motivation and commitment to learning. Conversely, students with negative attitudes may resist or disengage from the assessment process, impacting the validity and reliability of the assessment outcomes [30]. Understanding the factors that shape students' perceptions and attitudes toward portfolio assessment practices is essential for designing effective assessment strategies and promoting student success. Factors such as clear communication of assessment criteria, scaffolded support for portfolio development, and opportunities for feedback and reflection have been identified as critical elements in enhancing students' experiences with portfolio assessment [15, 29, 30]. While portfolio assessment offers valuable opportunities for promoting student learning and assessment, it is essential to consider students' perceptions and attitudes to ensure its effectiveness and acceptance in educational settings.

2.4 Teachers' Perceptions towards Portfolio Assessment Practices

Several studies have explored teachers' perceptions of portfolio assessment, revealing insights into their understanding and use of this assessment method. For example, Nungari [11] and Caldwell [9] found that teachers perceived portfolio assessment as a valuable tool for promoting deeper learning and student engagement. They appreciated the opportunity for students to showcase their learning progress and demonstrate their understanding of key concepts through portfolios. In addition, Gearhart and Osmundson [18] reported that using a portfolio can improve teachers' perceptions of their own performance by helping them grow, giving them chances to learn again, helping them revise assessment criteria, scoring and interpreting student responses, and using the information to inform instruction and give

feedback to students. However, despite the perceived benefits, teachers may also face challenges and concerns in implementing portfolio assessment practices caused by challenges such as workload, lack of training, and concerns about reliability and validity. Research by Caldwell [9] and Bagheri & Ghaffari [26] highlighted teachers' concerns about the time and effort required to design, implement, and evaluate portfolios effectively. They also expressed uncertainties about the reliability and validity of assessment outcomes derived from portfolios, particularly in subject areas with diverse learning objectives and assessment criteria.

2.5 Teachers' Attitudes towards Portfolio Assessment Practices

Teachers' attitudes toward portfolio assessment practices play a crucial role in shaping their implementation and effectiveness. Caldwell [9] and Nungari [11] demonstrated that teachers with positive attitudes toward portfolio assessment were more likely to invest time and effort into designing authentic assessment tasks, providing meaningful feedback, and supporting students' reflective practices. Conversely, teachers with negative attitudes may resist or overlook portfolio assessment, relying on more traditional assessment methods that may not capture the full range of students' learning experiences and achievements. To address teachers' concerns and promote positive attitudes toward portfolio assessment, professional development and support are essential [6,13]. Research by AlRadini [29] emphasised the importance of ongoing training and collaboration opportunities for teachers to enhance their understanding of portfolio assessment principles, develop effective assessment tasks, and refine their feedback and evaluation practices. While portfolio assessment offers valuable opportunities for promoting student learning and assessment, it is essential to consider these stakeholders perceptions and attitudes to ensure its successful implementation and impact on student outcomes.

2.6 Conceptual Framework of the Study

The conceptual framework of this study is grounded in constructivist theory, the principle of authentic assessment, and the theory of planned behaviour, providing theoretical underpinnings for understanding teachers' and students' perceptions and attitudes towards portfolio

assessment practices. Constructivist theory informs reflective practices inherent in portfolio assessment, highlighting the active construction of knowledge by students. The authentic assessment principle underscores the importance of real-world tasks and contexts, aligning with the holistic nature of portfolio assessment [3]. The theory of planned behaviour offers insights into how perceptions influence attitudes and intentions towards portfolio assessment [31]. Consequently, the conceptual framework is rooted in the exploration of perceptions, attitudes, and alignment and divergence between the key stakeholders regarding portfolio assessment practices in higher education. It encompasses interconnected key components, including portfolio assessment practices, teachers' and students' perceptions, teachers' and students' attitudes, and alignment and divergence between the teachers (lecturers) and students. Fig. 1 illustrates the conceptual framework, highlighting the relationships between the various components in the context of the study.

The conceptual framework (Fig. 1) elucidates the dynamic relationships between key variables related to portfolio assessment practices in higher education. At the core of the framework lies 'Portfolio Assessment Practices,' which encompasses the strategies and procedures employed for assessing student learning through portfolios. Surrounding this central variable are interconnected components representing the perceptions and attitudes of both teachers and students towards portfolio assessment.

'Teachers' Perceptions' encompasses educators' beliefs, opinions, and understandings regarding portfolio assessment practices. Importantly, these perceptions influence teachers' attitudes towards portfolio assessment, shaping their overall disposition and approach towards this assessment method. The 'Students' Perceptions' represent learners' perspectives on portfolio assessment practices, involving their strategy awareness and understanding of procedures. Students' perceptions, in turn, influence their attitudes towards portfolio assessment. The bidirectional arrow between 'Teachers' Attitudes' and 'Students' Attitudes' symbolises the reciprocal nature of influence between lecturers and students within the context of portfolio assessment practices. Teachers' attitudes may shape their instructional approaches and feedback strategies, which can impact students' perceptions, attitudes, and experiences with portfolio assessment. Similarly, students' attitudes toward portfolio assessment may influence teachers' perceptions, attitudes, and practices over time. The final component of the framework, 'Alignment and Divergence Between Perceptions,' examines the degree to which teachers' and students' perceptions align and diverge regarding various aspects of portfolio assessment practices, respectively. This variable highlights the nuanced interplay between stakeholders' perspectives and serves as a lens through which to understand the congruence and discordance in perceptions within educational settings, offering a roadmap for investigating the complexities of portfolio assessment practices.

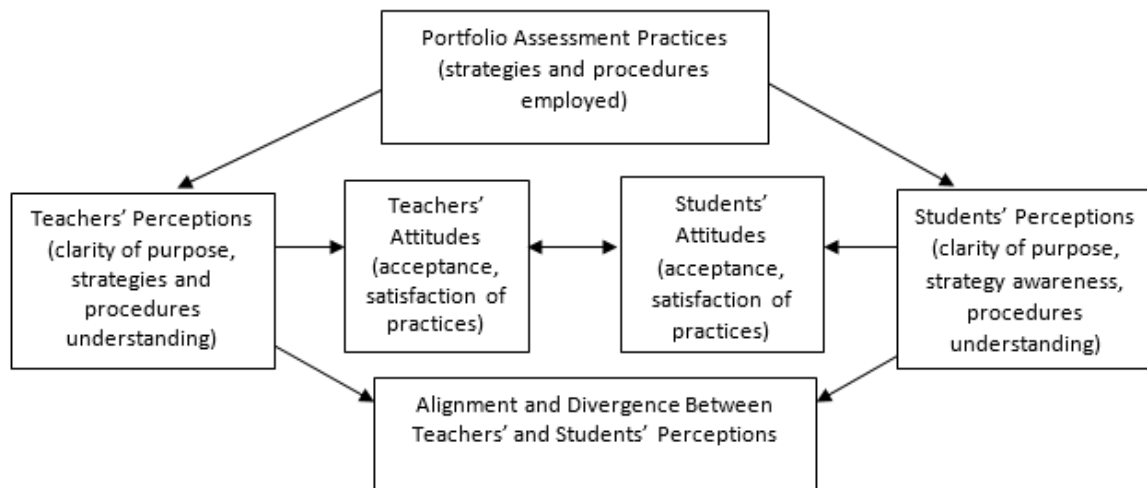


Fig. 1. Conceptual Framework of the Study

3. MATERIALS AND METHODS

This section presents the research design, sample and sampling techniques employed, and data collection and analysis techniques.

3.1 Research Design

A survey research design was used in this study to understand lecturers' and students' views and attitudes towards using portfolios as an assessment tool at the university. This research design was very helpful to describe the attitudes and opinions of the population [32]. Milles and Gay [33] stressed that survey design involves gathering data to test hypotheses or find out what people think about a particular subject or situation.

In line with the chosen survey research design, the methodological approach herein outlines the systematic procedures employed in this study to systematically investigate the research questions and objectives.

3.1.1 Methodological approach

The methodology encompassed a systematic series of steps. The process commenced with the design of instruments, which involved the development of five-point Likert scale questionnaires for both lecturers and students,

ranging from strongly disagree to strongly agree, to comprehensively capture perceptions and attitudes. These questionnaires underwent reliability testing, scrutinising internal consistency to ensure robustness. Additionally, face and content validity were assessed by a senior lecturer, further enhancing the credibility of the instruments. Following instrument development, informed consent was diligently obtained from all participants before the sampling of final-year science education students and their lecturers. Stratified random sampling was employed to select students, while purposeful sampling was utilised to select lecturers. Upon securing consent and sampling participants, the designed survey questionnaires were distributed and collected with careful attention to detail. Subsequently, data analysis was conducted using descriptive statistics, including frequencies, means, and percentages, to get insights into the participants' perceptions and attitudes. The results were interpreted to derive meaningful implications for practice, ultimately contributing to the comprehensive dissemination of research outcomes. Drawing upon these implications, the research findings were summarised, leading to the formulation of concise conclusion and actionable recommendations. These insights were presented in the final research report, ensuring clarity and accessibility for diverse stakeholders. Fig. 2 shows the methodological flowchart of the study.

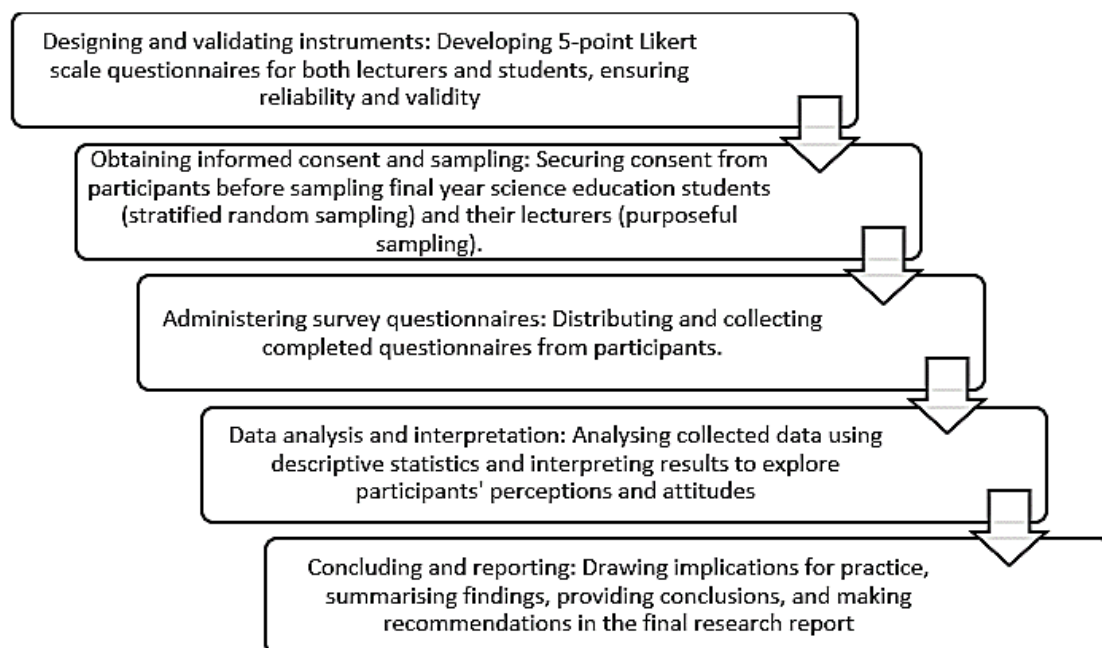


Fig. 2 Methodological Flowchart of the Study

3.2 Research Sample and Sampling Technique

The participants of this study were final-year students of the Faculty of Science Education pursuing various Bachelor of Science (BSc) programmes at the University of Education, Winneba, and their lecturers. This institution was chosen because of the researchers' familiarity and affiliation with it. The researchers were graduate students at the university at the time of the study. This prior connection provides the researchers with a deep understanding of the university's environment, educational programmes, and policies. Their familiarity with the institution was needed to facilitate access to resources and participants, simplifying the research process, and helping establish trust and rapport with the participants, potentially leading to greater cooperation and willingness to participate in the study. Since portfolio assessments are done in the final year, only final-year (level 400) students were involved in the study of various first-degree science programmes including Biology education, Chemistry education, Physics education, and Integrated Science education. The students were selected using stratified random sampling, ensuring that the sample obtained accurately reflect the population of interest and, therefore, the diversity of students across the different programmes [34]. The sample of students consists of 52 diverse students studying at level 400 of various science-related programmes who responded to the questionnaire even though 150 students were invited. Thus, the responsive rate for the students' questionnaire was 34.66%. Moreover, purposeful sampling was used to select five lecturers lecturing at the faculty of science education at the university. The purposeful sampling was used because it allows the researchers to carefully choose participants with relevant experiences, knowledge, or viewpoints regarding the study topic [35]. All the lecturers responded to the questionnaire; hence, the responsive rate for the lecturers' questionnaire was 100%.

3.3 Instrumentation

The main instruments used for the study were questionnaires, thus lecturers' and students' questionnaires. The lecturers' questionnaire gathered lecturers' attitudes and perceptions towards using portfolios as an assessment tool, using a five-point Likert scale made up of 16 items and 3 items for perceptions and attitudes, respectively. The research instrument was

validated by a senior lecturer of the faculty of science education at the university, who was not part of the study sample. The instrument was amended based on the senior lecturer's comments and suggestions. The internal consistency reliability of the questionnaire was found to be 0.853, as measured by Cronbach's alpha in SPSS. In addition, the students' questionnaire, similarly made up of the same number of items, allowed the students to rate their degree of agreement based on their perceptions and attitudes toward the items using the five-point Likert scale. The face and content validity of the questionnaire were checked by the same reviewer who reviewed the students' questionnaire. The internal consistency of the questionnaire was 0.821, as measured by Cronbach's alpha in SPSS.

The participants were asked to rate their level of agreement against the statement ranging from 'Strongly Disagree' to 'Strongly Agree'. 'Strongly Disagree' (SD) indicate strong disagreement, while 'Strongly Agree' (SA) indicate strong agreement. The intermediate responses 'Disagree' (D), 'Neutral Statement' (NS), and 'Agree' (A) represent varying degrees of disagreement or agreement, respectively. A total score was computed in such a way that the positive perception and attitude were given a higher score and the negative perception and attitude were given a lower score. Thus, for the determination of the mean and interpretation of the lecturers' and students' responses to items on the Likert scale, the various sentimental levels were assigned numerical values as: SD = 1.0; D = 2.0; NS = 3.0; A = 4.0; SA = 5.0.

Data collection for the study took place between June 2021 and August 2021, reflecting a timeframe of almost three years since the completion of the survey.

3.4 Data Analysis

Descriptive statistics were also used to gauge the level of perceptions and attitudes of the students and the lecturers. Frequencies, percentages, and means were used to analyse lecturers' and students' responses to the Likert-scale items.

The mean score (M) for each item on the Likert scale was calculated using the formula:

$$\text{Mean (M)} = \frac{(n_{SD} \times 1) + (n_D \times 2) + (n_{NS} \times 3) + (n_A \times 4) + (n_{SA} \times 5)}{N}$$

Where:

- nSD represents the number of responses for Strongly Agree;
- nD represents the number of responses for Disagree;
- nNS represents the number of responses for Neutral Statement;
- nA represents the number of responses for Agree;
- nSA represents the number of responses for Strongly Agree;
- N represents the total number of responses.

This calculation provided a numerical representation of the lecturers' and students' average disagreement or agreement with each statement.

4. RESEARCH RESULTS

This section presents the results along with the research questions that guided the study.

For efficient results analysis and presentation, the lecturers' and students' perceptions and attitudes were categorised based on their mean Likert scale scores. Accordingly, to indicate the level of agreement or disagreement with the statement, scores falling within a certain range were classified as: 'Very low' (with mean scores between 0.0 and 1.5); 'Low' (with mean scores between 1.6 and 2.5); 'Moderate' (with mean scores between 2.6 and 3.5); and 'High' (with mean scores between 3.6 and 4.5); 'Very high' (with mean scores between 4.6 and 5.0), perceptions, and attitudes. Interpretatively, the ranks 'Moderate', 'High', and 'Very High' represent positive perceptions or attitudes, while the 'Low' and 'Very Low' represent negative perceptions or attitudes.

4.1 The Perceptions of the Lecturers and Students Regarding Portfolio Assessment Practices

4.1.1 Lecturers' perceptions of portfolio assessment practices

The lecturers' responses to the questionnaire were analysed to understand their perceptions towards using portfolios as an assessment tool, regarding portfolio purpose and objectives, and portfolio procedures.

The analysis of Table 1 indicated that lecturers demonstrated a high level of awareness regarding the purpose and rationale of using portfolios, with a mean score of 4.20 (high). Additionally, lecturers' responses revealed that they didn't communicate portfolio purposes and objectives clearly to their students, with a mean score of 2.40 (low).

Displayed in Table are lecturers' responses to the procedures of portfolio assessment. Lecturers indicated that students are not provided with samples of good portfolios to guide their work, with a mean score of 2.40 (low). Regarding class time allocation, lecturers reported unsatisfactory time dedicated specifically for portfolios, with a mean score of 2.20 (low). Also, though the lecturers' responses indicated that there was insufficient collaboration between students and teachers in terms of compiling portfolio materials (mean score of 1.80, low), they acknowledged involvement of students through collaboration with peers (mean score of 3.20, moderate). Moreover, the lecturers highlighted the time-consuming nature of marking portfolios (with a mean score of 2.40, low) and the insufficient class time dedicated to portfolios (with a mean score of 2.20, low). Notwithstanding, the lecturers report that there were clear evaluation forms and rubrics (with a mean score of 4.40) and emphasised the importance of providing feedback to students, with a mean score of 2.60 (moderate). Overall, the lecturers regard portfolio assessment as an efficient assessment tool for identifying students' strengths and weaknesses and hence must be utilised in every higher education.

4.1.2 Students' perceptions of portfolio assessment practices

The students' responses to the questionnaire were analysed to understand their perceptions towards using portfolios as an assessment tool, regarding portfolio purpose and objectives, and portfolio procedures.

Presented in Table 3 are the responses from students regarding the purpose and objectives of portfolio assessment practices. Students indicated a less clear understanding of the purpose of using portfolios, with a mean score of 2.15 (low). Similarly, they reported that objectives are not adequately explained and communicated, as evidenced by a mean score of 1.86 (low).

Table 1. Lecturers' responses to items regarding purpose and objectives (N=5)

| S/N | Item | SDN | DN | NSN | AN | SAN | M | Interpretation |
|-------------------------|--|-----|----|-----|----|-----|-------------|-----------------|
| 1. | There is clear purpose of using portfolios | 0 | 0 | 0 | 4 | 1 | 4.20 | High |
| 2. | Objectives are communicated to students | 0 | 3 | 2 | 0 | 0 | 2.40 | Low |
| Overall Mean (M) | | | | | | | 3.30 | Moderate |

Table 2. Lecturers' responses to items regarding portfolio procedures (N=5)

| S/N | Item | SDN | DN | NSN | AN | SAN | M | Interpretation |
|-------------------------|--|-----|----|-----|----|-----|-------------|-----------------|
| 3. | Students are provided with samples of good portfolios. | 0 | 3 | 2 | 0 | 0 | 2.40 | Low |
| 4. | Class time is dedicated to portfolios. | 1 | 2 | 2 | 0 | 0 | 2.20 | Low |
| 5. | Portfolio completion involves student-lecturer collaboration | 1 | 4 | 0 | 0 | 0 | 1.80 | Low |
| 6. | Portfolio completion involves student-student collaboration | 0 | 0 | 4 | 1 | 0 | 3.20 | Moderate |
| 7. | Not time consuming in marking | 0 | 3 | 2 | 0 | 0 | 2.40 | Low |
| 8. | Students are provided feedback | 0 | 3 | 1 | 1 | 0 | 2.60 | Moderate |
| 9. | There is a track of student's development and progression | 0 | 2 | 3 | 0 | 0 | 2.60 | Moderate |
| 10. | Reference for lecturer on students' progression. | 0 | 2 | 2 | 1 | 0 | 2.80 | Moderate |
| 11. | Portfolios are evaluated at different intervals. | 1 | 2 | 2 | 0 | 0 | 2.20 | Low |
| 12. | There is clear evaluation forms and rubrics. | 0 | 0 | 0 | 3 | 2 | 4.40 | High |
| 13. | Students' strengths and weaknesses are diagnosed through portfolio. | 0 | 0 | 2 | 3 | 0 | 3.60 | High |
| 14. | There is adequate guidance to build portfolio | 0 | 1 | 1 | 3 | 0 | 3.40 | Moderate |
| 15. | Portfolio procedures are widely perceived as essential element in educational programmes | 0 | 0 | 0 | 3 | 2 | 4.40 | High |
| 16. | Building portfolio is a stressful process | 0 | 0 | 0 | 4 | 1 | 4.20 | High |
| Overall Mean (M) | | | | | | | 3.01 | Moderate |

Table 3. Students' responses to items regarding purpose and objectives (N=52)

| S/N | Item | SDN | DN | NSN | AN | SAN | M | Interpretation |
|-------------------------|---|-----|----|-----|----|-----|-------------|----------------|
| 1. | There is clear purpose of using portfolios | 12 | 20 | 20 | 0 | 0 | 2.15 | Low |
| 2. | Objectives are explained and communicated to students | 19 | 23 | 8 | 2 | 0 | 1.86 | Low |
| Overall Mean (M) | | | | | | | 2.00 | Low |

Table 4. Students' responses to items regarding portfolio procedures (N=52)

| S/N | Item | SDN | DN | NSN | AN | SAN | M | Interpretation |
|-------------------------|---|-----|----|-----|----|-----|-------------|----------------|
| 3. | Adequate time was allocated for oral examination | 19 | 21 | 6 | 4 | 2 | 2.01 | Low |
| 4. | Class time is dedicated to portfolios. | 16 | 30 | 0 | 5 | 1 | 1.94 | Low |
| 5 | Portfolio completion involves student-lecturer collaboration | 32 | 15 | 4 | 1 | 0 | 1.50 | Very low |
| 6. | Portfolio completion involves student-student collaboration | 13 | 12 | 3 | 19 | 5 | 2.82 | Moderate |
| 7. | Portfolio work was time-consuming | 0 | 1 | 11 | 23 | 17 | 4.07 | High |
| 8. | Students are provided feedback | 7 | 13 | 16 | 13 | 3 | 2.84 | Moderate |
| 9. | Teacher explained the evaluation rubrics | 35 | 12 | 3 | 1 | 1 | 1.48 | Very low |
| 10. | Teacher provided samples of good portfolios. | 14 | 15 | 13 | 9 | 1 | 2.38 | Low |
| 11. | Portfolios are evaluated at different intervals | 10 | 29 | 5 | 8 | 0 | 2.21 | Low |
| 12. | I enjoyed building and using the portfolio | 16 | 11 | 13 | 11 | 1 | 2.42 | Low |
| 13. | Students' strengths and weaknesses are diagnosed | 1 | 14 | 18 | 15 | 4 | 3.13 | Moderate |
| 14. | There is adequate guidance to build portfolio | 9 | 21 | 6 | 16 | 0 | 2.55 | Low |
| 15. | Building portfolio is a stressful process | 0 | 4 | 8 | 24 | 16 | 4.00 | High |
| 16. | The portfolio procedure has influenced my perception when encountering problems | 8 | 13 | 19 | 11 | 1 | 2.69 | Moderate |
| Overall Mean (M) | | | | | | | 2.57 | Low |

Table 5. Lecturers’ overall attitudes towards using portfolio as an assessment tool (N=5)

| S/N | Scale Value | Attribute category | N | % |
|-----|-------------|--------------------|---|----|
| 1. | 0.0 – 1.5 | Very low attitude | 0 | 0 |
| 2. | 1.6 – 2.5 | Low attitude | 1 | 20 |
| 3. | 2.6 – 3.5 | Moderate attitude | 3 | 60 |
| 4. | 3.6 – 4.5 | High attitude | 1 | 20 |
| 5. | 4.6 – 5.0 | Very high attitude | 0 | 0 |

Table 6. Students’ overall attitudes towards using portfolio as an assessment tool (N=52)

| S/N | Scale Value | Attribute category | N | % |
|-----|-------------|--------------------|----|------|
| 1. | 0.0 – 1.5 | Very low attitude | 0 | 0 |
| 2. | 1.6 – 2.5 | Low attitude | 31 | 59.6 |
| 3. | 2.6 – 3.5 | Moderate attitude | 13 | 25.0 |
| 4. | 3.6 – 4.5 | High attitude | 8 | 15.3 |
| 5. | 4.6 – 5.0 | Very high attitude | 0 | 0 |

Provided in Table 4 are insights on students’ perspectives on the procedures associated with portfolios. Students expressed dissatisfaction with the allocation of adequate time for oral examinations, as indicated by a mean score of 2.01 (low). Similarly, they reported that class time dedicated to portfolios is insufficient (mean score of 1.94, low) and there is minimal involvement in portfolio completion through collaboration with lecturers (mean score of 1.50, very low). They highlighted the time-consuming nature of portfolio work, with a mean score of 4.07 (high), and expressed a desire for more guidance in building portfolios (mean score of 2.55, low). Overall, students expressed concerns regarding workload, time allocation, and the need for collaboration and clearer guidance and support in portfolio assessment practices.

4.2 The overall Attitudes of Lecturers and Students towards Portfolio Assessment Method

The lecturers’ and students’ responses to the questionnaire were analysed to determine their overall attitude towards portfolio assessment practices based on the acceptance and satisfaction level of portfolio assessment practices in enhancing understanding of learning objectives, evaluating progress and achievements during practice, and improving skills. The results are presented in Tables 5 and 6.

As presented in Table 5, an overview of the overall attitudes of lecturers towards using portfolios as an assessment tool. The data revealed that the majority of lecturers (60%) exhibit a moderate attitude towards portfolio

assessment, indicating a balanced perspective on its effectiveness and utility. Only one lecturer (20%) expresses a high attitude, while the other (20%) demonstrates a low attitude. This suggests a varied range of attitudes among lecturers, with some embracing portfolio assessment more enthusiastically than others. Additionally, referring to Tables 1 and 2 for lecturers’ perceptions of portfolio assessment practices, the overall mean (M) further illuminates their attitudes towards this assessment method. With moderate-to-high mean scores for items related to the purpose, objectives, procedures, and benefits of portfolio assessment practices, lecturers generally demonstrate positive perceptions. These positive perceptions likely contribute to the majority of lecturers exhibiting a moderate attitude towards portfolio assessment.

Outlined in Table 2 are the overall attitudes of students towards using portfolios as an assessment tool. The data revealed that the majority of students (59.6%) demonstrate a low attitude towards portfolio assessment, indicating a less favourable perception of its effectiveness or relevance. A smaller proportion (25.0%) exhibits a moderate attitude, while a minority (15.3%) expresses a high attitude. None of the students demonstrate a very low or very high attitude towards portfolio assessment. Additionally, considering Tables 3 and 4 for students’ perceptions of portfolio assessment practices, the overall mean (M) further elucidates their attitudes towards this assessment method. With low mean scores for items related to the purpose, objectives, procedures, and benefits of portfolio assessment practices, students generally demonstrate fewer positive perceptions

compared to lecturers. These perceptions likely contribute to the majority of students exhibiting a low attitude towards portfolio assessment.

4.3 Alignments and Divergences in Perceptions of Portfolio Assessment Practices between Lecturers and Students

To investigate the alignment and divergence between the perceptions of lecturers and students concerning portfolio assessment practices, the data from Tables 1, 2, 3, 4, 5, and 6, focusing on both perceptions and attitudes, were analysed.

4.3.1 Alignment of perceptions and attitudes

4.3.1.1 Alignment regarding purpose and objectives of portfolios

Both lecturers and students agree that objectives should be clearly communicated to students. In such vein, lecturers indicate the ineffective communication of objectives deficiency, with a low mean score of 2.40 (Table 1), whereas the students indicate a strong alignment with this deficiency, with a slightly lower mean score of 1.86 (Table 3). This indicates a communication gap between these two groups.

4.3.1.2 Alignment regarding portfolio assessment procedures

Both lecturers and students acknowledge the importance of collaboration in portfolio procedures. While the students express a preference for student-student collaboration (mean score of 2.84, moderate) and also indicate inadequate lecturer-student collaboration (mean score of 1.50, very low) in Table 4, the lecturers recognise the value of collaboration with a mean score of 1.80 (very low) in Table 2, indicating a shared understanding of the benefits of collaborative learning. Moreover, both groups perceive portfolio building as time-consuming task and therefore highly stressful, as reflected by the mean scores around 4 (4.20, 4.00) and the corresponding interpretation, high, in their respective tables (Table 2, Table 4), suggesting that both groups share a common recognition of the challenges of portfolio building. Furthermore, both groups agree that students are not provided with good samples of portfolios. While lecturers acknowledge this deficiency (mean score of 2.40, low) in Table 2, students also express dissatisfaction with the absence of good samples

(mean score of 2.38, low), contributing to their overall low attitude towards portfolio assessment in Table 6. Additionally, both groups agree that portfolio assessment is effective in diagnosing students' strengths and weaknesses. Lecturers rate this aspect highly, with a mean score of 3.60 (high) in Table 2, while students acknowledge the diagnostic value of portfolios, with a mean score of 3.13 (moderate) in Table 4.

4.3.2 Divergence of perceptions and attitudes

4.3.2.1 Divergence regarding purpose and objectives of portfolios

Tables 1 and 3 provide insights into the perceptions of lecturers and students regarding the purpose and objectives of portfolio assessment practices, respectively. Lecturers generally perceive a clear purpose for using portfolios (Table 1), while students indicate a lower level of clarity in this aspect (Table 3). This suggests a potential misalignment in understanding the purpose of portfolio assessment between the two groups.

4.3.2.2 Divergence regarding portfolio assessment procedures

Moreover, Tables 2 and 4 further elaborate on the perceptions of lecturers and students regarding portfolio procedures, indicating that lecturers and students show differing perceptions regarding certain aspects of portfolio procedures. For instance, in Table 2, the lecturers emphasise the importance of integrating portfolio procedures into a large part of the educational programme (a mean score of 4.40, high). However, students, as in Table 4, may not share the same level of enthusiasm for this integration (mean score of 2.42, low), as reflected in their overall attitudes towards portfolio assessment in Table 6. This suggests a divergence in perceptions regarding the extent to which portfolio procedures should permeate the educational programme. Furthermore, lecturers acknowledge the adequacy of guidance, the involvement of students in portfolio completion, and the evaluation of student progress (Table 2). However, the students convey dissatisfaction with aspects such as time allocation, guidance, explanation of evaluation rubrics, and collaboration with lecturers (Table 4). These inconsistencies suggest the need to effectively provide well-rounded support and guidance for students in portfolio building and completion.

4.3.2.3 Divergence regarding attitude towards portfolio assessment practices

Tables 5 and 6 outline the overall attitudes of lecturers and students towards using portfolios as assessment tools, respectively. Lecturers predominantly exhibit a moderate attitude towards portfolio assessment (Table 5), indicating a balanced perspective. In contrast, students generally exhibit low attitudes towards portfolio assessment, with a majority expressing dissatisfaction (Table 6), indicating a less favourable perception of its effectiveness or relevance. The significant differences in overall attitudes mirror a notable contrast in perceptions between these two groups.

5. DISCUSSION

In this section, the discussion explores the interpretation of the study results pertaining to lecturers' and students' perceptions and attitudes towards portfolio assessment practices and the alignment and divergence between these groups. It further examines the implications for portfolio assessment practices and the strengths and limitations of the study.

5.1 Alignment and Divergence of Lecturers' and Students' Perceptions

The analysis of the perceptions of both lecturers and students sheds light on the various aspects of portfolio assessment practices. Lecturers demonstrated a high level of awareness regarding the purpose and objectives of using portfolios, emphasising their role in facilitating student learning, which aligns with findings from previous studies [14,36] (Ma'arif et al., 2021). However, concerns were raised about the clarity and communication of objectives to students, indicating a gap in instructional practices. In contrast, students expressed less clarity regarding the purpose and objectives of portfolio assessment practices, reflecting a disconnect between educators' intentions and students' understanding. This finding deviates from some previous studies that found students to have a clearer understanding of assessment objectives [1, 36]. Possible reasons for this discrepancy could include variations in instructional practices or differences in students' prior experiences with portfolio assessment. Alignment between lecturers and students is evident in certain areas, such as the recognition of the value of collaboration in portfolio procedures and the effectiveness of this assessment in diagnosing

students' strengths and weaknesses. These findings resonate with prior research emphasising the importance of collaboration and diagnostic assessment in portfolio practices [25, 36, 37]. However, divergences exist regarding the adequacy of guidance, the integration of portfolio procedures into the educational programme, and the provision of good portfolio samples. While lecturers perceive these aspects more positively, students' expressions of dissatisfaction highlight discrepancies in their experiences and expectations and areas where further investigation and intervention may be necessary. These findings contribute to our understanding of the complexities inherent in portfolio assessment practices and emphasise the importance of bridging the gap between educators' perspectives and students' experiences by creating a more supportive and effective assessment environment, as suggested by Suwaed [13] and Salah EIDin et al. [17].

5.2 Alignment and Divergence of Lecturers' and Students' Attitudes

The overall attitudes of lecturers and students towards portfolio assessment methods reflect their perceptions and experiences of their effectiveness and relevance. Lecturers predominantly exhibit a moderate attitude towards portfolio assessment, indicating a balanced perspective on its utility and benefits. This aligns with their positive perceptions of portfolio assessment practices, particularly regarding their purpose, objectives, and procedures, consistent with findings from previous studies [11, 22, 38]. In contrast, students demonstrate low attitudes towards portfolio assessment, indicating a less favourable perception of its effectiveness or relevance in their learning experiences. This divergence in attitudes reflects the discrepancies in their perceptions of portfolio assessment practices, particularly regarding workload, time allocation, and the provision of support and guidance, which aligns with research highlighting students' concerns about workload and support in portfolio assessment [11,15], contradicting Ghoorchaee & Tavakoli [7] and Alwraikat [23] studies. While alignment exists in the recognition of the benefits of portfolio assessment, such as diagnosing students' strengths and weaknesses, divergences in attitudes underscore the need for educators to address students' concerns and provide adequate support to enhance their engagement and participation in the assessment process. These findings are consistent with prior

research emphasising the importance of providing adequate support and guidance to enhance student engagement and participation in portfolio assessment [15, 29].

5.3 Implications for Portfolio Assessment Practices

Globally, portfolio assessment is recognised as an effective method for evaluating student learning outcomes in educational settings [1,2,37]. This assessment practice offers numerous benefits for both educators and students, as aligned with the findings of the study. For students, portfolio assessment promotes deeper engagement with course materials, encourages reflection, and fosters a sense of ownership over their learning journey [16,17,37]. Additionally, portfolio assessment provides opportunities for students to demonstrate their understanding of concepts in diverse ways, catering to different learning styles and preferences [3,9,13]. This aligns with the study's findings, which highlighted students' recognition of the diagnostic value of portfolios in identifying their strengths and weaknesses. Furthermore, portfolio assessment supports the development of essential skills such as communication, self-assessment, critical thinking, and goal-setting, preparing students for future academic and professional endeavours [14,17,21]. The study's findings regarding students' desire for clearer guidance and support in portfolio assessment practices underscore the importance of fostering these skills through effective instructional strategies and scaffolding. For educators, portfolio assessment provides a comprehensive view of student progress and achievement, enabling them to tailor instruction to meet individual learning needs [9,12,21,25], aligning with the study's findings regarding lecturers' perceptions of portfolio assessment as an efficient tool for diagnosing students' strengths and weaknesses. Additionally, portfolio assessment encourages educators to reflect on their teaching practices, identify areas for improvement, and make informed instructional decisions [7,19,21]. This resonates with the study's findings regarding lecturers' recognition of the value of feedback provision and the importance of integrating portfolio procedures into every part of the educational programme.

However, common challenges associated with portfolio assessment practices have been identified, aligning with the findings of this study. These challenges include issues related to

communication and clarity of assessment objectives, interest levels, time constraints, workload concerns, and the need for adequate support and guidance for both students and educators [11,15,17,38]. In addressing these concerns, authors such as Davis et al. [15], AlRadini [29], and Schrempf et al. [30] emphasise the importance of educators in ensuring clear communication of goals and objectives and providing adequate support and guidance to students throughout the portfolio assessment process. Others, such as Caldwell [9], highlight the need for accurate time allocation, and AlRadini [29], Muin and Hafidah [6], Davis & Ponnampuruma [38], and Suwaed [13] suggest a need for ongoing training and support for lecturers to improve instructional practices and enhance the implementation of portfolio assessment methods. Moreover, Farid [10], Davis et al. [15], and Schrempf et al. [30] underscore the significance of fostering collaborative relationships between educators and students to facilitate meaningful engagement and participation in portfolio assessment practices. They argue that addressing discrepancies in perceptions and attitudes and promoting a supportive and inclusive assessment environment are essential for maximising the benefits of portfolio assessment for student learning and growth. Nonetheless, it is important to acknowledge that challenges may exist and that they may vary across different higher education contexts. Educators should recognise the unique challenges faced within their own institutions and work towards identifying and addressing them to improve portfolio assessment practices effectively. By adopting a proactive approach and implementing targeted solutions, such as enhancing collaboration, providing adequate guidance and support to students, accurate time allocation, and offering training and support for lecturers, educators can mitigate these challenges and create a conducive environment for meaningful portfolio assessment experiences.

5.4 Strengths and Limitations of the Study

This study exhibits a number of strengths that enhance the validity and relevance of the findings. The inclusion of final-year science education students pursuing various BSc. Science Education programmes and their lecturers ensured a diverse range of perspectives and experiences were represented in the analysis, enhancing the depth and

applicability of the findings. Moreover, the study's in-depth analysis of perceptions, attitudes, and alignment and divergence between lecturers and students allowed for nuanced insights into the complexities of portfolio assessment practices. Furthermore, the study's findings offer practical implications for educators and institutions, informing strategies to enhance communication, collaboration, and transparency in portfolio assessment practices. However, several limitations must be acknowledged. The study was conducted at a single institution, which may limit the generalisability of the findings to other educational contexts. Future research could explore portfolio assessment practices in different institutional settings to assess the impact of contextual factors. Also, the study's sample size of lecturers and students may also restrict the generalisability of the findings. Including a larger and more diverse sample could provide a broader understanding of perceptions and attitudes towards portfolio assessment practices. Additionally, the study's cross-sectional design, which provides a temporal snapshot of perceptions and attitudes at a specific time, limits its ability to capture changes in perceptions and attitudes over time. Longitudinal research could provide a more dynamic understanding of how perceptions of portfolio assessment practices evolve, influence portfolio assessment practices, and change in response to educational experiences and interventions. Moreover, the age of the data raises considerations regarding its applicability to current educational practices and contexts. While the data collected over the past two years offer valuable insights into lecturers' and students' perceptions and attitudes at that time, it is important to exercise caution in generalising these findings to present contexts, considering potential changes in participants' perspectives over time and the evolving nature of educational practices or policies.

6. SUMMARY, CONCLUSION AND RECOMMENDATION

This section presents summary of the main findings, conclusions followed by recommendations.

6.1 Summary of Findings

1. Lecturers generally perceive a clear purpose for portfolio assessment practices, while students express lower levels of satisfaction with these aspects.

2. Lecturers exhibit moderate attitudes towards portfolio assessment, while students predominantly demonstrate low attitudes towards this assessment method.
3. There is alignment between lecturers and students regarding some aspects of portfolio assessment practices, such as the importance of communicating objectives and providing feedback to students, the value of student-lecturer collaboration, and the common recognition of portfolio practices in diagnosing students' strengths and weaknesses. However, discrepancies emerge regarding the adequacy of guidance and time allocated for portfolio activities and the general level of satisfaction with practices

6.2 Conclusion

In conclusion, this study provided valuable insights into the perceptions of both lecturers and students regarding portfolio assessment practices, their influence on overall attitudes towards this assessment method, and the alignment and divergence between their perspectives. The findings emphasise the importance of understanding and addressing issues of concern about perceptions and attitudes between lecturers and students to enhance the effectiveness and acceptance of portfolio assessment practices in higher education. By considering the implications of these findings, educators can bridge any gaps through future research and targeted pedagogical interventions that enhance the quality of assessment practices and promote more meaningful engagement among key stakeholders, leading to student learning and success.

6.3 Recommendations

Based on the findings of this study, the following recommendations can be made to enhance the effectiveness of portfolio assessment practices:

1. Institutions should prioritise efforts to improve communication and transparency regarding the purpose, objectives, and procedures of portfolio assessment. Providing clear guidelines, expectations, and opportunities for dialogue can help bridge the gap between lecturers and students.

2. Collaborative approaches involving both lecturers and students in assessment design, implementation, and evaluation can promote a sense of ownership and engagement with portfolio assessment practices. Encouraging collaboration and dialogue can foster a more inclusive and participatory assessment culture in higher education.
3. Institutions should prioritise the ongoing evaluation and refinement of portfolio assessment practices to ensure alignment with educational goals and objectives. Regular feedback from both lecturers and students should be sought and incorporated to enhance the effectiveness and relevance of portfolio assessment practices over time.
4. Recognising the diverse needs and preferences of students, institutions should provide tailored support and guidance to facilitate effective engagement with portfolio assessment practices. Offering resources, training, and feedback mechanisms can empower students to navigate the assessment process with confidence and competence.
5. Institutions should foster an open teaching and learning environment that embraces diverse assessment methods, including various portfolio assessment practices, to promote student engagement, critical thinking, and holistic learning experiences.
6. Future studies could conduct qualitative data collection methods such as interviews or open-ended surveys to explore the perceptions, experiences, and suggestions of both students and lecturers regarding portfolio assessment practices.

ETHICAL CONSIDERATION

Upholding ethical guidelines and protecting the rights of both students and lecturers were paramount to this study. Accordingly, informed consent was obtained from all participants prior to their involvement in the survey. The students and lecturers were provided with detailed information about the aim and procedures of the study, the voluntary nature of participation, and procedures for data confidentiality and anonymity. Measures were implemented to protect the privacy and confidentiality of the

participants throughout the survey process. Personal identifying information was anonymised and kept confidential. Confidentiality was maintained in the reporting of findings.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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