

Assessment and Feedback in Higher Education: A Meta-analysis of Best Practices and Student Perceptions

Penilaian dan Umpan Balik di Pendidikan Tinggi: Sebuah Meta-analisis Praktik Terbaik dan Persepsi Mahasiswa

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ABSTRACT

Assessment and feedback in higher education play a key role in improving students' learning experiences and academic outcomes, especially in online and hybrid learning contexts. This research aims to explore students' perceptions of the effectiveness of various assessment and feedback methods in this environment. The method used is systematic meta-analysis with the PRISMA approach, involving collection and analysis of data from various international databases. The results showed that immediate and delayed feedback had different impacts on learning, with immediate feedback supporting rapid error correction and delayed feedback improving knowledge retention. The implication of these findings is the need to design assessment strategies that consider feedback timing and effective integration of online elements in hybrid learning to increase student motivation and learning outcomes.

Keywords: Assessment, feedback, higher education, online learning, hybrid learning, student perceptions.

ABSTRAK

Penilaian dan umpan balik dalam pendidikan tinggi memegang peran kunci dalam meningkatkan pengalaman belajar dan hasil akademik mahasiswa, terutama dalam konteks pembelajaran daring dan hybrid. Penelitian ini bertujuan untuk mengeksplorasi persepsi mahasiswa terhadap efektivitas berbagai metode penilaian dan umpan balik dalam lingkungan tersebut. Metode yang digunakan adalah meta-analisis sistematis dengan pendekatan PRISMA, melibatkan pengumpulan dan analisis data dari berbagai database internasional. Hasil penelitian menunjukkan bahwa umpan balik segera dan tertunda memiliki dampak berbeda pada pembelajaran, dengan umpan balik segera mendukung perbaikan kesalahan cepat dan umpan balik tertunda meningkatkan retensi pengetahuan. Implikasi dari temuan ini adalah perlunya desain strategi penilaian yang mempertimbangkan waktu umpan balik dan integrasi efektif elemen daring dalam pembelajaran hybrid untuk meningkatkan motivasi dan hasil belajar mahasiswa.

Kata Kunci: Penilaian, umpan balik, pendidikan tinggi, pembelajaran daring, pembelajaran hybrid, persepsi mahasiswa.

1. Introduction

Assessment and feedback in higher education are essential components that have a significant impact on students' learning experiences and academic outcomes. Research consistently emphasizes the importance of effective assessment practices and feedback mechanisms in improving student learning and performance (Brooks et al., 2019; Bhattacharyya et al., 2020; Enu & Ndlovu, 2022; Cobbold & Wright, 2021). Feedback, in particular, plays a crucial role in providing students with information about their progress, helping them identify strengths and areas for improvement (Brooks et al., 2019; Bhattacharyya et al., 2020). It is important to note that feedback must be specific, constructive, and timely for students to perceive it as helpful (Brooks et al., 2019). Additionally, feedback needs to be aligned with assessment criteria to effectively guide students (Brooks et al., 2019).

Students' perceptions of assessment and feedback are influenced by various factors, including the nature of the feedback, the timing of the feedback, and the clarity of expectations (Brooks et al., 2019; Bhattacharyya et al., 2020; Miao, 2023). Educators must understand how students perceive and engage with feedback to adjust their practice effectively (Bhatti et al., 2020). Implementation of formative assessment and feedback practices has been shown to have a positive impact on student learning outcomes and academic performance (Enu & Ndlovu, 2022; Cobbold & Wright, 2021). In the realm of higher education, students' attitudes towards peer assessment and feedback have been explored, emphasizing the importance of building students' confidence in their assessment and feedback skills (Chen et al., 2021). Additionally, the utilization of technology-based feedback tools has been identified as a valuable resource in providing constructive feedback and supporting student learning processes (Ducasse, 2023). Overall, the literature emphasizes the crucial role of assessment and feedback in higher education, highlighting the continuous need for improved feedback practices to meet students' expectations and enhance their learning experiences (Gomis, 2023; Deeley et al., 2019; Elsayed & Cakir, 2023; Preston et al., 2019; Sari & Saadah, 2022;

In recent years, online and hybrid learning has experienced a significant increase in the higher education context. This transformation was triggered by advances in information technology and the urgent need to provide flexible and widely accessible education. Online and hybrid learning systems offer great potential in broadening the reach of education and enabling the tailoring of learning experiences to suit individual student needs. In this context, assessment and feedback play a crucial role. These two elements not only function as a tool to measure academic achievement, but also as a mechanism to guide and improve the student learning process. Effective assessment and constructive feedback can increase motivation, improve understanding of material, and direct students toward achieving their academic goals.

However, implementing assessment and feedback methods in online and hybrid learning faces various challenges. One of the main challenges is the adaptation of traditional assessment methods into digital formats that may not always suit the dynamics of online interactions. Limitations in technology, accessibility issues, as well as a lack of clarity in feedback can affect the effectiveness of the assessment methods applied. Additionally, students' perceptions of the effectiveness of these methods vary significantly, depending on personal experience, background, and individual preferences. This variability adds complexity in assessing the extent to which the methods used can effectively meet student learning needs.

A relevant research question in this context is: What are students' perceptions of the effectiveness of various assessment and feedback methods in online and hybrid learning contexts? This question aims to dig deeper into how students assess various assessment and feedback methods implemented in online and hybrid learning environments. By answering this question, it is hoped that clearer insight can be gained regarding the advantages and disadvantages of these methods and their implications for student learning experiences. This research will make an important contribution in identifying best practices and areas for improvement in the application of assessment and feedback in the digital era.

There is a lack of in-depth research on student perceptions of assessment and feedback methods in online and hybrid learning contexts. While there are a number of studies that address assessment and feedback in higher education, many of them focus on traditional learning environments or have not fully explored the specific dynamics of online and hybrid formats. The lack of focus on student perceptions in this context creates a significant knowledge gap, which needs to be filled in order to fully understand how assessment and feedback methods influence students' learning experiences in digital environments.

The importance of this research has only increased with technological developments and a major shift towards online and hybrid learning, exacerbated by the global pandemic. Information technology has facilitated expanded access to education, but has also presented

new challenges in terms of assessment and feedback. To ensure the effectiveness of assessment and feedback methods in this format, it is important to understand how students respond to and interact with these methods. This understanding is not only important for improving the quality of education but also for adapting and improving assessment practices to better suit the needs and expectations of students in the digital era.

This research offers a new contribution by focusing on students' perceptions of various assessment and feedback methods in the context of online and hybrid learning, which is an area that remains relatively under-researched. Most of the existing literature tends to focus on assessment in face-to-face contexts or does not specifically address the challenges and advantages of online and hybrid methods. By exploring student perceptions in depth, this research is expected to reveal new insights that have not been previously explored in existing literature.

This research has the potential to provide valuable insights into best practices in assessment and feedback that could be adopted by higher education institutions. The findings from this research will help in formulating better policies and practices for online and hybrid learning, thereby increasing student effectiveness and satisfaction. In addition, this contribution also supports the development of educational strategies that are more adaptive and responsive to student needs and preferences in an ever-evolving learning environment.

2. Methods

To compile a comprehensive literature review regarding student perceptions of the effectiveness of assessment and feedback methods in online and hybrid learning, a systematic approach involving the PRISMA method was used. This method was designed to ensure transparent and standardized selection and analysis of articles. The article selection process begins with collecting data from various reputable international databases that are known for their credibility and literature coverage, such as Scopus, Web of Science, and Google Scholar.

Keywords used in the article search included "Assessment methods," "feedback," "higher education," "online learning," "hybrid learning," and "student perceptions." The use of these keywords aims to identify relevant and specific articles regarding assessment and feedback methods in the context of online and hybrid learning.

The total number of articles identified from the database was [number of articles], reflecting the initial coverage of the existing literature on this topic. Next, inclusion and exclusion techniques were applied to filter the most relevant articles. Inclusion criteria included peer-reviewed articles published within the last 10 years and having direct relevance to the research topic. Articles that were not available in full, were not published in English or Indonesian, and did not match the research focus were excluded from selection. The selection process was carried out in stages, starting with screening of titles and abstracts, followed by full text review to ensure suitability, and finally finalization of the list of relevant articles. This process ensures that the literature included in the review is of the most relevant and high quality, providing a solid foundation for the analysis and synthesis of research findings related to student perceptions of assessment and feedback methods in online and hybrid learning environments.

3. Results and Discussions

3.1. Definition of Valuation Method

Assessment methods in education, particularly in the context of formative and summative assessments, involve the use of feedback to improve learning outcomes. Feedback given immediately after students answer an item, and feedback given after all items in a test have been completed, play an important role in shaping the learning process (Taxipulati & Hai-dong, 2021). Immediate feedback is often associated with better error correction on near transfer items, whereas delayed feedback is believed to improve retention of learned concepts,

leading to better performance on far transfer tasks (Ryan, 2023). The timing of feedback, whether immediate or delayed, influences the rate of learning and the utilization of prediction errors to update stimulus values (Weber, 2024).

Research suggests that immediate feedback may be more effective for certain outcomes such as speed of acquisition, while delayed feedback may be optimal for knowledge retention (Fyfe et al., 2021; Fyfe et al., 2019). Immediate feedback has been linked to better performance in conceptual knowledge learning, while delayed feedback may be more beneficial for situational knowledge learning ("Immediate Versus Delayed Feedback on Learning: Do People's Instincts Really Conflict With Reality?", 2021). Additionally, the desired difficulty framework proposes that delayed feedback during practice, although slowing initial learning, may result in better long-term retention (Suzuki et al., 2019).

In the context of assessment, formative assessment aims to support students' specific needs throughout the course, while summative assessment evaluates students' overall achievement at the end of the term relative to learning goals and standards (Vero & Chukwuemeka, 2019). The timing of feedback, whether immediate or delayed, can influence feedback processing and subsequent learning outcomes (Candel et al., 2020). Although immediate feedback is effective, there is emerging evidence suggesting that delayed feedback, especially for difficult items, may be more beneficial (Chamberland et al., 2019; Brock et al., 2020). In conclusion, the choice between immediate and delayed feedback in assessment methods depends on the specific learning objectives and desired outcomes. Immediate feedback can aid in error correction and speed of acquisition, while delayed feedback can improve knowledge retention and performance on challenging tasks. Understanding the nuances of the timing of feedback is critical in designing effective assessment strategies to optimize learning outcomes.

3.2. Definition of Online and Hybrid Learning

Hybrid learning, as defined by Colin and Moonen and cited in Rovai & Jordan (2004), involves the integration of traditional face-to-face teaching with online learning, where the online component functions as a natural extension of traditional classroom teaching (Hafni & Fithriani, 2021). This educational approach has gained significant attention in higher education as a primary strategy, combining direct teaching with technological tools to enhance the learning experience (Krisna, 2024). The concept of hybrid learning is often used interchangeably with blended learning, which includes various models that integrate face-to-face and online components (Hrastinski, 2019). Bonk and Graham (2005) document three general definitions of hybrid learning, emphasizing the combination of various teaching modalities, methods, and delivery media (Mudariah et al., 2021).

Hybrid learning offers a flexible and engaging environment for students, allowing them to experience face-to-face interactions as well as online activities, which encourages adaptability and improves learning outcomes (Kavak, 2022). This approach differs from fully online or fully face-to-face teaching, providing a balanced mix of scheduled class work and online learning that can be done at one's own pace (Yuniar, 2023). Integration between conventional learning and web-based approaches is characteristic of hybrid learning, creating a combined classroom-based model that enriches the educational process (Mukadar et al., 2022).

In the context of the ever-evolving educational landscape, the definition of hybrid learning varies among academics. Some consider it equivalent to blended learning, while others see it as the incorporation of massive open online courses (MOOCs) or related technologies into the traditional curriculum (Martín et al., 2022). The effectiveness of blended learning, including hybrid components, has been proven in areas such as pharmacy education, where students show a preference for this approach compared to traditional methods (Balakrishnan et al., 2021). In conclusion, hybrid learning represents a dynamic educational

model that combines traditional classroom teaching with online elements to create a versatile and effective learning environment. By integrating face-to-face interactions with online tools, hybrid learning caters to a variety of learning styles and preferences, offering a comprehensive approach to education in the digital age.

3.3. Student Perceptions

Perception in the learning context refers to the way individuals interpret and understand information, experiences and stimuli in the educational environment (Alshumaimeri, 2023). Factors influencing perceptions can vary widely and include internal factors such as individual characteristics, learning styles, study habits, and physical and mental health, and external factors such as the learning environment, social context, and career obligations (Alshumaimeri, 2023; "Perceptions of First-Year Students in Online Lectures in the Covid-19 Pandemic Era Viewed from Learning Motivation," 2022). In addition, teachers' perceptions play a crucial role in determining their willingness to implement certain assessment strategies in the classroom (Alsubaiai, 2021). In the context of career choice, factors such as task perception, self-perception of abilities, and values are the main indicators that influence individual decisions, such as choosing a teaching profession (Wang, 2024). Furthermore, students' interest in certain careers, such as life sciences, is influenced by their self-efficacy and perceptions of those careers (Mohtar et al., 2019).

To understand perception, it is important to consider various dimensions such as risk perception. For example, in the context of medical students, COVID-19 risk perception is influenced by dimensions such as perceived health threat, severity, controllability, and likelihood of infection (Qin et al., 2021). Additionally, perceptions of fog among college students were measured using a scale that considered factors influencing their perceptions of fog, indicating the importance of reliable tools in understanding perceptions (Zhang et al., 2022). Likewise, factors influencing perceived health risks from endocrine disrupting chemicals are categorized into sociodemographic, family-related, cognitive, and psychosocial factors, highlighting the complexity of influences on risk perception (Pravednikov, 2024). Overall, perception in the educational context is a complex construct and is influenced by various internal and external factors. Understanding these factors is critical for educators, policymakers, and researchers to improve learning experiences, assessment practices, and overall educational outcomes.

3.4. Assessment Methods in Online and Hybrid Learning

Assessment methods in online and hybrid learning include various tools and techniques for evaluating student learning outcomes. Assessment is often carried out through quizzes, assignments, exams and projects (Widiasih et al., 2023). These methods allow measuring student activity and progress, providing feedback, and maintaining motivation (Widiasih et al., 2023). E-learning platforms provide opportunities for assessment through tests, quizzes, and the use of learning analytics to identify individual learning needs (Andersson et al., 2022). Automated assessment systems and computer-based assessment approaches are supported in distance learning and online universities (Ismail et al., 2019). Additionally, the use of gamified learning and formative assessment in online flipped approaches has shown positive effects on student engagement (Zainuddin et al., 2021). Formative assessment integrated into teaching and learning activities facilitates the provision of continuous and timely feedback to students (Ismail et al., 2019).

E-learning tools such as quizzes have proven effective in improving student learning outcomes. Quizzes not only provide direct feedback to students but also help deepen their understanding of the material (Widiasih et al., 2023). In addition, implementing quizzes successfully helps students review topics and improve their learning experience (Crucho et al., 2020). The use of online tools, including gamification and scavenger hunts, has been shown to

increase student motivation and awareness, leading to better learning outcomes (Alajaji & Alshwiah, 2021). In conclusion, the integration of quizzes, assignments, exams, and projects, along with e-learning platforms and automated evaluation tools, play a crucial role in assessing student learning in online and hybrid learning environments. This assessment method not only measures student progress and provides feedback but also increases engagement, motivation, and overall learning outcomes.

3.5. Feedback in Online and Hybrid Contexts

Feedback in the context of online and hybrid learning in higher education encompasses a variety of forms, including written, verbal, and digital feedback. The role of technology in providing feedback has become increasingly significant, especially in the context of the COVID-19 pandemic, which accelerated the global adoption of online and hybrid teaching modes (Xing et al., 2023). Technology plays a crucial role in facilitating the feedback process, especially in virtual learning environments, where technology supports a bottom-up approach to decision making and increases students' sense of inclusion and engagement (Lusher et al., 2023). The increasing popularity of online and hybrid education models is due to the flexibility, engagement opportunities, and peer-to-peer interactions they offer, which poses challenges for educators in maintaining student interest and motivation (Almusaed, 2023).

In the realm of higher education, the integration of formative assessment in hybrid pedagogy has become essential for adapting educational practices to online and hybrid teaching environments, thereby improving the quality of teaching provided (Gavranovic, 2023). Additionally, the application of sentiment analysis to formative assessment in higher education has been explored, providing insight into how this method is applied in online and hybrid learning contexts (Grimalt-Álvaro & Usart, 2023). The mainstreaming of online graduate education has sparked new research interest in self-regulated and co-regulated learning in hybrid, blended, and fully online environments (Peters et al., 2022).

In the context of developing higher-order thinking skills in higher education, online and blended learning has been examined for its effectiveness in promoting creativity and critical thinking ("Fostering higher-order thinking skills online in higher education", 2024). Additionally, ongoing and flipped STEM education has emphasized the potential of online-based formative assessment interfaces to enhance interactions between educators and learners (Jeong et al., 2020). Systematic feedback during courses, whether taught online, in a hybrid format, or face-to-face, has been highlighted as a valuable tool to inform pedagogical decisions and improve learning outcomes (Sciutto, 2021).

The digital transition in the educational process, especially in online and hybrid classrooms, has emphasized the importance of digitizing feedback. However, research on the online feedback processes that guide digitalization remains limited, indicating a need for further exploration in this area (Sedrakyan, 2023). The significance of feedback in the context of online teacher education has been reemphasized, with challenges identified in maintaining clarity, affective engagement, and multimodal meaning in digitally mediated feedback communications (Pereira et al., 2021). In conclusion, feedback in the context of online and hybrid learning in higher education is evolving alongside an increasing reliance on technology to provide various forms of feedback. Educators face the challenge of adapting to the increasing popularity of online and hybrid education models, while ensuring effective feedback mechanisms to support student learning and engagement.

3.6. Student Perceptions of Assessment Effectiveness

In higher education, students' perceptions of assessment play an important role in determining the effectiveness of educational practices. Various studies have explored this area, providing insight into various aspects related to student perceptions (Mustaq, 2024; Jaffar et al., 2020; Khemchand, 2023; Bazvand, 2023; El Sayad, 2023; Nyazi, 2023). Factors such as

credibility, clarity, and relevance significantly influence how students view assessments (Phindane, 2021). The quality and effectiveness of higher education development, along with the creation of assessment and measurement criteria, are important considerations in understanding student perceptions (Vasilev, 2024).

Research shows that students' attitudes towards assessment tasks can influence their learning approaches, with students who have strong ideas more likely to adopt deep learning tactics (Jaffar et al., 2020). Additionally, fairness in the assessment process has been highlighted as a key aspect of student perceptions in higher education (Khemchand, 2023). Ethical considerations in the development, administration, assessment, and communication of assessments can significantly influence how students view assessments (Bazvand, 2023).

Furthermore, the educational environment, including factors such as learning outcomes, knowledge acquisition, and satisfaction, plays an important role in shaping students' perceptions of assessment (Gosak et al., 2021). Understanding students' perceptions of the learning environment is critical for institutions to proactively address their needs and increase the effectiveness of educational practices (Salazar-Erazo, 2024). In addition, student success and satisfaction are indicators of the quality of the educational climate (Rejeb et al., 2022). In conclusion, students' perceptions of assessment in higher education are multifaceted and influenced by various factors. By considering aspects such as credibility, clarity, relevance, fairness, and ethical practices in assessments, institutions can better understand and improve student learning experiences and outcomes.

3.7. Student Perceptions of Feedback Effectiveness

In higher education, students' perceptions of feedback play a crucial role in shaping the effectiveness of feedback practices. Students' attitudes and preferences towards the type of feedback significantly influence how feedback impacts their motivation and learning outcomes. Research shows that personalized feedback can positively influence students' perceptions, motivation, and engagement levels, which in turn improves learning outcomes (Fengyu, 2023). Effective feedback has been identified as a key strategy in learning and teaching, emphasizing the importance of understanding students' perceptions of feedback and how it contributes to their learning process (Singh, 2019). Additionally, formative feedback, when used by students as a learning mechanism, can increase motivation and self-regulated behavior, ultimately improving learning outcomes (Pan & Gan, 2019).

Feedback design, educator-related factors, and student-related factors all play a role in the feedback process and can influence its effectiveness on student learning outcomes (Jiang et al., 2022). In addition, assessment for learning (AFL) has been highlighted as a pedagogical approach that improves student learning outcomes through high-quality feedback (Asyhari, 2024). Furthermore, the quality of feedback provided to students is strongly related to their perceived competence and the relevance of their learning experience, indicating the importance of feedback in facilitating sustained motivation and efficiency in blended learning environments (Radovan, 2024). In conclusion, students' preferences for the type of feedback and the impact of feedback on motivation and learning outcomes are closely related. Understanding students' attitudes toward feedback, providing personalized and formative feedback, and considering the various factors that influence the feedback process are important for promoting positive student perceptions, increasing motivation, and ultimately, improving learning outcomes in higher education.

4. Conclusion

Assessment in education, both formative and summative, plays a crucial role in improving learning outcomes. Feedback, whether immediate or delayed, has different impacts on learning. Immediate feedback is often associated with error correction and speed of acquisition, while delayed feedback is more beneficial for knowledge retention and

performance on challenging tasks. Online and hybrid learning integrates face-to-face and online elements, provides a flexible and adaptive approach, and enhances the learning experience by leveraging technology tools. Student perceptions of assessment and feedback have a major influence on the effectiveness of educational practices. This perception is influenced by complex internal and external factors, which require special attention from educators and policy makers to improve learning outcomes and student satisfaction.

4.1. Implications

These findings have several important implications for educational practice and curriculum design. First, educators need to consider the timing of providing feedback in designing assessment strategies to achieve optimal learning outcomes. Immediate feedback can be applied to quickly correct errors, while delayed feedback should be used to strengthen knowledge retention. Second, the integration of online elements in hybrid learning must be carefully designed to leverage the benefits of both face-to-face and online teaching methods, as well as increase student engagement. Third, understanding students' perceptions of assessment and feedback can help educational institutions design fairer, clearer and more relevant practices, thereby improving motivation and learning outcomes.

4.2. Limitations

This research faces several limitations, including limited research coverage of assessment and feedback methods in various educational contexts. Variations in the effectiveness of immediate and delayed feedback may be influenced by specific factors that cannot always be generalized. Additionally, the definition and implementation of hybrid learning may vary across institutions, which may influence results and findings. Student perceptions may also vary based on demographic factors and learning environment, which need to be taken into account in further analysis.

4.3. Future Research Directions

Future research could examine more deeply how variations in assessment and feedback methods influence learning outcomes across disciplines and educational levels. Additional research is needed to explore how technology can be more effective in supporting feedback and assessment in online and hybrid environments. Additionally, further study of student perceptions of assessment and feedback could help identify better strategies to improve the learning experience and student satisfaction. Longitudinal research that assesses the long-term impact of feedback and assessment on learning outcomes may also provide additional insight into the effectiveness of various assessment approaches.

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