e-ISSN: 2710-2122, p-ISSN: 2710-2114
2024: Vol 6, pp 1-21. https://doi.org/10.38140/ijer-2024.vol6.38
Interdisciplinary Journal of Education Research

E-Formative Feedback in Emergency Remote Learning: First-Year Student Teachers' Experiences and Challenges

Raudina M. Simelane[1*]
Preya Pillay[2]

AFFILIATIONS

[1&2]Division of Curriculum Studies, University of the Witwatersrand, Johannesburg, South Africa.

CORRESPONDENCE

Email: preya.pillay@wits.ac.za*

EDITORIAL DATES
Received: 19 June 2024
Revised: 16 September 2024
Accepted: 24 September 2024
Published: 13 October 2024

DOI: 10.38140/ijer-2024.vol6.38

Abstract: This study examined the role of e-formative feedback in emergency remote teaching and learning for first-year student teachers. Numerous scholars have acknowledged the pedagogical value of formative feedback in teacher education. However, there is a pressing need for significant improvement in the quality and accessibility of e-formative feedback provided to student teachers in online learning environments. This study explored the nature of e-formative feedback, technological challenges, and pedagogical practices employed by teacher educators when implementing formative assessment in emergency remote learning contexts. The study is underpinned by Interactive Tutoring Feedback model as the theoretical framework. We utilised the interpretive paradigm and a qualitative approach, specifically employing a case study methodology as a means of inquiry. The empirical investigation involved 20 first-year student teachers selected purposively from a large public university in South Africa. Data were collected through semi-structured interviews and analysis of learning management system logs, with thematic analysis employed to analyse the data. The findings revealed that meaningful e-formative feedback could have been enhanced by addressing contextual factors such as limited internet connectivity and a lack of familiarity with online learning platforms. While student teachers valued the quality of e-formative feedback, they expressed concern regarding their ability to consistently access and engage with feedback to improve their learning in the isolated online environment. This paper recommends providing both student teachers and teacher educators with the necessary technological support and training to effectively utilise e-formative feedback and enhance student teachers' academic achievement and professional development during emergency remote learning.

Keywords: Assessment, e-formative feedback, teacher education, emergency remote learning, academic achievement.

1. Introduction

In the rapidly evolving landscape of higher education, e-formative feedback has emerged as a critical component of teaching and learning, particularly within online and emergency remote learning contexts. This is particularly salient for first-year student teachers who encounter the dual challenge of acclimatising to higher education whilst also preparing for their prospective roles as educators. The COVID-19 pandemic has further underscored the importance of effective e-formative feedback strategies, as institutions worldwide were compelled to transition to emergency remote teaching (Hodges et al., 2020). E-formative feedback encompasses any digital information, process, or activity that enhances learners' understanding based on comments related to formative or summative online assessments (Gikandi et al., 2011). For first-year student teachers, effective e-formative feedback can provide essential guidance as they cultivate their teaching skills and pedagogical knowledge in a virtual environment. Nevertheless, the implementation of e-formative feedback during emergency remote teaching presents unique challenges that necessitate careful consideration and innovative approaches.

How to cite this article:
Simelane, R. M., & Pillay, P. (2024). E-formative feedback in emergency remote learning: First-year student teachers' experiences and challenges. *Interdisciplinary Journal of Education Research, 6*, 1–21. https://doi.org/10.38140/ijer-2024.vol6.38

The transition to higher education represents a significant obstacle for first-year students, involving adaptation to new learning environments, the development of academic skills, and the management of increased workloads (van der Zanden et al., 2018). These challenges are exacerbated in emergency remote learning contexts, which are defined as unplanned and rapid shifts to online teaching and learning in response to crises or disasters, such as the COVID-19 pandemic. Unlike planned online education, emergency remote learning is characterised by its sudden implementation, often with limited preparation time for both educators and students (Hodges et al., 2020). In these scenarios, students must navigate unfamiliar digital platforms and engage in learning without the traditional support structures associated with face-to-face education, frequently while contending with additional stressors linked to the overarching emergency.

The COVID-19 pandemic presented a unique and prolonged emergency remote learning context, distinct from shorter-term emergencies such as natural disasters or localised crises. While numerous studies have examined various facets of education during the pandemic, the specific challenges and long-term implications of e-formative feedback within this context, particularly for first-year student teachers, remain underexplored. This study aims to address this gap by focusing on the sustained impact of emergency remote learning on e-formative feedback practices and their effectiveness for first-year student teachers, who are not only adapting to higher education but also preparing for their future roles as educators in an increasingly digital world.

Recent research has illuminated both the potential and the challenges associated with e-formative feedback in the context of emergency remote teaching. Carrillo and Flores (2020) found that while e-formative feedback provides new avenues for personalised learning, a considerable number of educators tend to rely excessively on written digital feedback, thereby overlooking the advantages of varied multimedia feedback options. This overreliance on text-based feedback can be particularly problematic for first-year students, who may find it challenging to interpret and act upon written feedback without the context and clarification typically afforded in face-to-face settings.

Furthermore, Winstone and Boud (2022) argue that for e-formative feedback to effectively enhance learners' engagement and uptake, a transition to a more learning-oriented approach is necessary. This approach underscores the active role of student teachers, particularly first-year students, in the e-formative feedback process, rather than merely concentrating on the quantity or quality of feedback provided by instructors. Despite the burgeoning corpus of research on online learning and assessment, there remains a significant lacuna in our understanding of how first-year student teachers specifically engage with and benefit from e-formative feedback in emergency remote learning contexts. Flores and Gago (2020) emphasise the scarcity of research on evidence-based e-formative feedback practices in teacher education during periods of emergency remote teaching. This gap in knowledge is particularly worrisome given the unique needs and challenges faced by first-year students as they embark on their journey in teacher education.

The present study aims to address this research gap by examining how first-year student teachers access, engage with, and utilise e-formative feedback in emergency remote learning environments. Specifically, this research seeks to:

- Explore the nature and types of e-formative feedback provided to first-year student teachers in emergency remote learning contexts.
- Identify the challenges first-year student teachers face when engaging with e-formative feedback in online environments.
- Investigate the technological and pedagogical support needs of first-year student teachers for effectively utilising e-formative feedback.
- Examine the role of e-formative feedback in supporting first-year student teachers' academic achievement and professional development during emergency remote learning.

By examining the experiences of first-year student teachers at a South African university during the COVID-19 pandemic, this study seeks to enhance our understanding of how to effectively support this vulnerable cohort as they navigate the complexities of teacher education within the framework of emergency remote learning. The findings of this research have the potential to inform the development of more effective e-formative feedback strategies and supportive systems for first-year student teachers, ultimately improving their learning experiences and outcomes in online and blended learning environments.

2. Literature Review

Scholars Gikandi et al. (2011) assert that e-formative feedback aims to facilitate online learning and provide digital information to enable learners to be more effective and to bridge any existing gaps in their understanding. In alignment with this perspective, Shute (2008) defines e-feedback as information regarding the existing "gap" between the actual level of performance and the reference level of performance in online environments, emphasising that information is deemed feedback if it influences this gap. Building on these foundational concepts, recent research from South Africa by Mpungose (2020) has underscored the critical role of e-formative feedback in sustaining student engagement during emergency remote teaching. Numerous studies have systematically investigated the implementation of e-formative feedback in online learning environments. Specifically, in the South African context, Motala and Menon (2020) examined the experiences of first-year students across multiple universities during the initial phases of the COVID-19 pandemic. Their findings highlighted the importance of timely and constructive e-formative feedback in assisting students in navigating unfamiliar online learning environments. They discovered that effective e-formative feedback in emergency remote learning often incorporated multimedia elements, such as audio or video comments, which aided in replicating certain aspects of face-to-face interaction.

Hattie and Timperley (2007) identify three distinct conceptualisations of e-formative feedback: as a digital product, as a consequence of online performance, and as an aspect of one's performance or understanding in virtual spaces. Expanding upon this, Mhlanga and Moloi (2020) investigated the use of various digital platforms for providing feedback in South African higher education institutions during the pandemic. Their research revealed that while learning management systems offered diverse tools for e-formative feedback, the effectiveness of these tools was largely contingent upon the manner in which they were implemented by educators and perceived by students.

Despite initial assertions regarding the significance and value of e-formative feedback in enhancing learners' academic achievements within the context of online education, there has been minimal progress in advancing the quality of e-formative feedback practices in emergency remote learning situations. Nevertheless, recent work by Songca et al. (2021) documented innovative approaches to e-formative feedback implemented across South African universities. These approaches included the utilisation of peer assessment tools, adaptive learning technologies, and automated feedback systems. Their study emphasised how these methods could enhance the quality, frequency, and accessibility of e-formative feedback, particularly for first-year students adjusting to university-level expectations within an online environment.

Hodges et al. (2020) underscore that the integration of e-formative feedback in emergency remote teaching and learning has been acknowledged from both national and international perspectives. In South Africa, Czerniewicz et al. (2020) conducted a comprehensive study on teaching and learning practices during the pandemic. They found that effective e-formative feedback in emergency remote learning often involved a combination of synchronous and asynchronous methods. Synchronous methods, such as live video sessions or chat discussions, facilitated immediate clarification and discourse, while asynchronous methods, including detailed written comments or annotated assignments, provided students with opportunities for deeper reflection and self-assessment.

2.1 Technological and pedagogical challenges in e-formative feedback

The quality of e-formative feedback in teaching and learning during emergency remote instruction remains a significant concern. Dube (2020) explored student experiences with e-formative feedback across various disciplines at a South African university, discovering that students valued detailed, personalised feedback but often struggled with relying solely on written feedback forms. This study underscored the necessity for diverse and multimodal approaches to e-formative feedback in the context of emergency remote teaching, particularly for students who may possess different learning styles or encounter language barriers.

Despite the well-documented advantages of e-formative feedback in online pedagogy, both students and instructors face numerous challenges when integrating it into emergency remote learning environments. Muhuro and Kang'ethe (2021) investigated the experiences of students from rural and low-income backgrounds in South Africa and found that limited access to technology significantly impeded their ability to engage with online learning and receive timely e-formative feedback. Their study revealed that inconsistent internet connectivity, a lack of suitable devices, and limited digital literacy skills were major obstacles to effective engagement with e-formative feedback.

Guangul et al. (2020) argue that when instructors plan to utilise written e-formative feedback in large online classes, they tend to reduce the number of activities and exercises to alleviate their digital marking workload, which compromises the sustainable application of detailed e-formative feedback. In the South African context, Ngubane-Mokiwa (2020) examined inclusive practices in online assessment and feedback, emphasising the need for flexible approaches that consider the diverse needs and circumstances of students. This study highlighted the importance of addressing accessibility issues when designing e-formative feedback strategies, particularly for students with disabilities or those from disadvantaged backgrounds.

Furthermore, the inadequacy of technological resources affects the equity of e-formative feedback, as learners from disadvantaged backgrounds may receive less feedback compared to their peers due to disparities in digital access, exacerbating achievement gaps in emergency remote learning contexts. This issue is particularly pronounced in South Africa, as underscored by Jansen and Farmer-Phillips (2021), who advocate for more longitudinal studies to comprehend the long-term impacts of emergency remote teaching practices on student learning outcomes. Their work emphasises the necessity for institutions to address these inequities through targeted support and resource allocation to ensure that all students can benefit from e-formative feedback. Another challenge in incorporating e-formative feedback is the adaptation to new modes of communication in online learning. Ramrathan (2020) argues for a reimagining of assessment and feedback practices in South African higher education, suggesting that the experiences of the pandemic provide an opportunity to develop more inclusive, flexible, and student-centred approaches to e-formative feedback. This includes considering how cultural and linguistic diversity in South Africa may impact the effectiveness of various e-formative feedback strategies and the necessity for culturally responsive approaches to feedback in online environments.

3. Theoretical Framework

The study is underpinned by the Interactive Tutoring Feedback (ITF) model proposed by Narciss and Huth (2004). This theoretical framework is pertinent to this study, as Winstone and Boud (2022) posit that electronic feedback not only facilitates online learning but also enhances digital inclusion, virtual communication, collaboration, and the professional development of both teacher educators and student teachers in emergency remote learning contexts. The ITF model commences with a clear identification and comprehension of the feedback content, function, and presentation within online environments. Subsequently, learners engage with this feedback to enhance their performance. The outcomes of these engagements provide evidence of learning and are analysed to identify any

deficiencies in learners' understanding within the digital space. Based on this analysis, informed decisions are made regarding the support provided to learners in their online learning endeavours. Figure 1 illustrates the theoretical framework adopted in this paper, followed by a brief explanation.

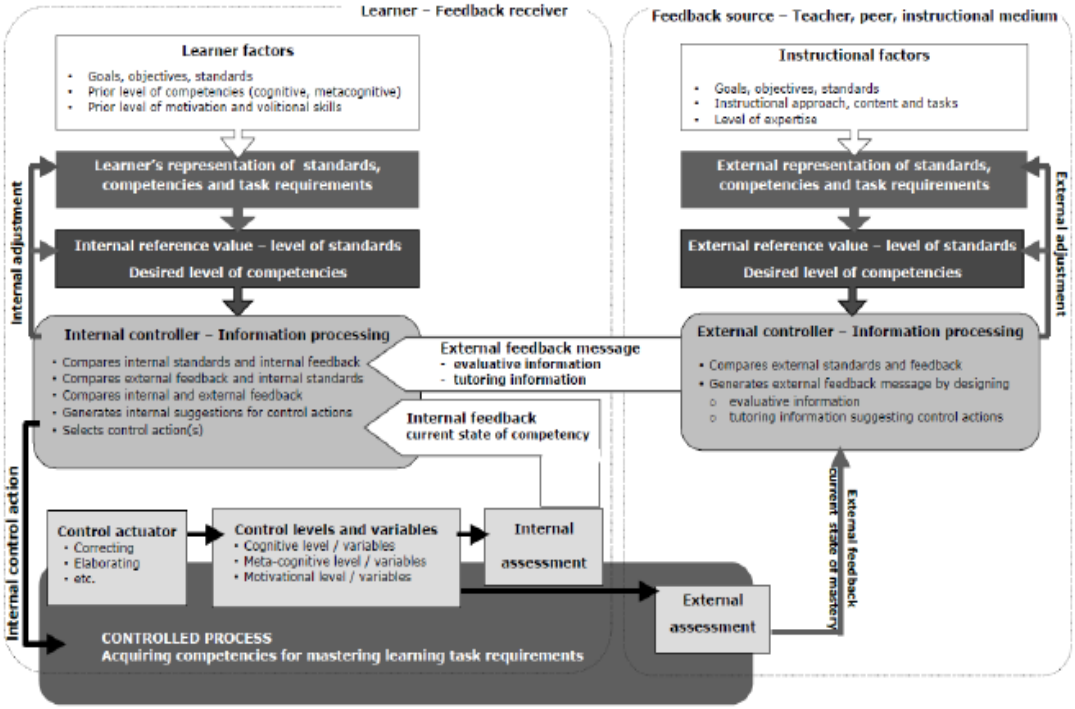

Figure 1: *Interactive tutoring feedback model (Narciss & Huth, 2004)*

E-formative feedback, an essential aspect of online formative assessment, can be described as an ongoing cyclic process in emergency remote teaching practice, as depicted in Figure 1 above. This process involves gathering digital information on learners' progress towards the short-term goals of the online lesson. The information collected is then used to determine the appropriate next steps for the learners and the digital actions required to take those steps in the virtual learning environment. However, it is crucial to note that learners are ultimately responsible for their own online learning. Therefore, the e-feedback learners receive on improving their understanding or skills pertaining to the specific concepts presented to them is key in virtual classroom activities. According to Shute and Rahimi (2017), e-formative assessment assists teacher educators in making effective instructional decisions to support student teachers in online contexts. Simultaneously, the information gathered about learners' progress provides digital feedback to the teacher educator, enabling them to adjust the pace of online teaching and learning or modify the virtual teaching approach to optimise opportunities for learning in emergency remote situations. Student teachers, too, can play a vital role in decision-making regarding their learning and direct their efforts more effectively if they understand the purpose of the online activities presented to them.

The ITF model emphasises three key components in the e-feedback process:

- Feedback Content: This refers to the evaluative and informative aspects of feedback provided in a digital format. In the context of emergency remote learning, this content must be clear, specific, and tailored to the online learning environment.
- Feedback Function: This component addresses the cognitive, metacognitive, and motivational functions of electronic feedback. Within the framework of emergency remote teaching, the function of feedback may require adaptation to address the unique challenges

associated with online learning, including the maintenance of engagement and motivation in a virtual environment.

- Presentation of Feedback: This encompasses the timing, scheduling, and mode of feedback delivery in the online context. The model acknowledges that, during emergency remote learning, the presentation of feedback may need to be more frequent and varied to compensate for the absence of face-to-face interaction.

Ultimately, it is not solely about understanding how to operate in the online space but also about comprehending the desired quality and learning goals to be achieved in emergency remote teaching contexts. The ITF model offers a comprehensive framework for examining how electronic formative feedback can be effectively implemented and utilised in these distinct learning environments.

4. Research Methodology

This paper employed a case study research design grounded in the interpretive qualitative paradigm as a mode of inquiry. The case study approach adheres to Yin's (2018) tradition, which is appropriate for this paper as it facilitates an in-depth exploration of first-year student teachers' experiences with e-formative feedback during emergency remote learning within a bounded context. One large public university in South Africa was selected as the research site. This institution is located in an urban area of Gauteng province but serves a diverse student population from both urban and rural backgrounds. The university was chosen for several reasons:

- Its location in an urban centre provided a baseline of technological infrastructure while still encompassing students from varied socio-economic backgrounds and geographical origins.
- The institution demonstrated a rapid transition to emergency remote teaching during the COVID-19 pandemic, implementing a range of e-learning tools and strategies.
- Its diverse student population, including individuals from rural areas who may have returned home during the pandemic, offered insights into a wide spectrum of experiences with e-formative feedback.
- The university's mix of students from different socio-economic backgrounds allowed for an examination of how varying levels of access to technology and internet connectivity impacted engagement with e-formative feedback.

This urban setting, combined with a student body that includes individuals from rural areas, provides a nuanced context for studying e-formative feedback practices. It allows for the exploration of challenges faced by students in urban areas with potentially better technological infrastructure, as well as those experienced by students who may have relocated to rural areas with limited connectivity during the pandemic. The urban location of the university itself meant that staff and on-campus resources had relatively stable internet access, contrasting with the varied experiences of students, particularly those who had to return to rural homes. This juxtaposition offered valuable insights into the disparities in access and engagement with e-formative feedback across different settings.

Qualitative data for this study were generated through semi-structured individual interviews and analysis of learning management system (LMS) logs. Examples of the interview questions include:

- "Can you describe the different types of e-formative feedback you have received in your courses during emergency remote learning?"
- "How has e-formative feedback affected your learning experience in the online environment?"
- "What challenges, if any, have you faced in accessing or understanding e-formative feedback in your courses?"
- "Can you give an example of a particularly helpful instance of e-formative feedback you received? What made it effective?"
- "How do you typically act upon the e-formative feedback you receive in your courses?"

- "What support or resources do you think would help you better engage with e-formative feedback in the online learning environment?"

These questions were designed to elicit detailed responses regarding participants' experiences, perceptions, and challenges related to e-formative feedback. Follow-up questions were posed based on participants' initial responses to gain deeper insights into their experiences. A limited number of closed questions were included to gather background and demographic information from the participants, such as their intended teaching specialisation and prior experience with online learning. However, the individual interview questions were predominantly open-ended to facilitate participants' free expression and sharing of their experiences with e-formative feedback during their first year of emergency remote learning.

Ethical approval for the study, which included the use of LMS logs, was obtained from the university's ethics committee. Participants provided informed consent for the collection and analysis of their LMS data, ensuring compliance with data protection regulations. Following the acquisition of permission from the university's ethics committee and the dean of the education faculty to act as gatekeepers and elucidate our research procedures, we recruited 20 first-year student teachers from various subject specialisations within the teacher education programme.

Purposive sampling was employed to select the first-year student teachers as participants, who signed digital consent forms guaranteeing privacy and confidentiality. The selection criteria for participants included:

- Enrolment as a first-year student in the teacher education program
- Experience with emergency remote learning during the COVID-19 pandemic
- Exposure to various forms of e-formative feedback in their courses
- Representation of diverse subject specialisations within the program

These criteria ensured that the selected participants were relevant and information-rich sources for addressing the research question concerning e-formative feedback experiences during emergency remote learning, particularly as they navigated the transition to higher education in an online environment. Each individual interview was conducted online using a video conferencing platform and lasted approximately one hour. Researchers also utilised LMS log analysis as an additional data collection method. With participants' consent, we examined their interactions with the LMS, focusing on their access to and engagement with various forms of e-formative feedback provided by their instructors. This digital trace data was employed to support and triangulate the information gathered during the semi-structured individual interviews with evidence of the actual online learning practices adopted by the first-year student teachers.

Following data collection, researchers organised the data to facilitate analysis. This involved transcribing interviews and analysing LMS log data. Through constant comparison and iterative analysis, researchers identified similarities and differences in the coded data. They checked for recurring ideas, concepts, and experiences across the collected data. Throughout this process, researchers maintained reflexivity, acknowledging their biases and assumptions, and remaining open to unexpected findings.

The data were analysed using thematic analysis, adhering to the guidelines of Braun and Clarke (2006). Vaismoradi et al. (2013) suggest that in qualitative research, thematic analysis aids in reinforcing the study's focus, rendering it appropriate for this paper as it prevents the analysis from straying and strengthens the emphasis on e-formative feedback experiences of first-year students. To generate themes, we coded by identifying common findings from participants' responses in the semi-structured interviews and subsequently corroborated those findings with the data collected from LMS logs.

To ensure trustworthiness, we employed member checking by sharing preliminary findings with participants for their feedback. We also engaged in peer debriefing with colleagues not involved in the study to challenge our assumptions and interpretations. An audit trail was maintained throughout the research process to document all decisions and procedures. Data triangulation was achieved by comparing the interview data with the LMS log analysis. This process involved identifying key themes from the interview data and then analysing LMS logs to find evidence of engagement with e-formative feedback. We compared the self-reported experiences from interviews with the observed behaviours in the LMS logs, noting any discrepancies or confirmations between the two data sources. This comparison allowed us to refine and validate the emerging themes. By cross-referencing participants' accounts with their actual online behaviours, we were able to gain a more comprehensive understanding of how first-year student teachers engaged with e-formative feedback in the emergency remote learning environment. This triangulation process enhanced the credibility of our findings by providing multiple perspectives on the phenomenon under study.

Ethical considerations were prioritised throughout the study, particularly given the vulnerability of first-year students adjusting to both university life and emergency remote learning. In addition to obtaining institutional approval, we ensured participant anonymity by using pseudonyms and removing any identifying information from the data. Participants were informed of their right to withdraw from the study at any time without consequence. Given the sensitive nature of discussing learning experiences during a challenging transition period, we provided participants with information about university support services should they experience any distress as a result of the interviews.

5. Presentation of Data

The study sampled twenty (20) first-year student teachers from a large public university in South Africa. It is noteworthy that pseudonyms were employed to identify the participants in this study. The designations ST1 to ST20 correspond to student teachers 1 through 20. The demographic profile of the participants is presented in Table 1 below.

Table 1: *Demographic profile of participants*

Participants	Intended Specialization	Gender	Prior E-Learning Experience	Access to Personal Computer
ST1	Mathematics	Female	None	Yes
ST2	English	Male	Some	No
ST3	Science	Female	None	Yes
ST4	History	Female	Extensive	Yes
ST5	Geography	Male	Some	No
ST5	Social Science	Male	Some	No
ST6	Zulu	Male	Some	No
ST7	Technology/Natural Science	Female	Some	No
ST8	Mathematics for Foundation phase and Literacy for FP Teachers	Female	Some	No
ST9	Natural Science and Technology	Female	Some	No
ST10	Art	Female	None	Yes
ST11	Engineering Graphics and Design	Male	Some	No
ST12	English	Male	Some	No

ST13	Geography	Female	Some	No
ST14	Mathematics for Foundation phase and Literacy for FP Teachers	Female	Some	No
ST15	Geography	Female	Some	No
ST16	Mathematics for Foundation phase and Literacy for FP Teachers	Female	Some	No
ST17	Mechanical Technology	Female	Some	No
ST18	Physical Science and Life Science	Female	Some	No
ST19	Engineering Graphics AND Design	Female	Some	No
ST20	Information Technology and English	Female	Some	No

The demographic data presented in Table 1 provides important context for interpreting the study's findings on e-formative feedback experiences. Several key observations can be made:

- Diverse Specialisations: The participants represent a wide range of teaching specialisations, from Mathematics and Sciences to Languages and Social Sciences. This diversity allows for a comprehensive exploration of e-formative feedback practices across different subject areas, as feedback strategies may vary depending on the discipline.
- Gender Distribution: The sample includes both male and female participants, with a slight majority of females. This gender balance helps ensure that the study captures a range of perspectives and experiences with e-formative feedback.
- Prior Online Learning Experience: Most participants had "Some" prior online learning experience, with a few having "None" and only one having "Extensive" experience. This variation in prior experience likely influences how students engage with and perceive e-formative feedback in the emergency remote learning context.
- Access to Personal Computers: Notably, only 4 out of 20 participants had access to a personal computer. This limited access to technology is a crucial factor that may significantly impact students' ability to engage consistently with online learning and e-formative feedback.

These demographic characteristics provide essential context for understanding the subsequent findings regarding experiences with e-formative feedback. For instance, the limited access to personal computers among participants may correlate with challenges in accessing and engaging with certain types of e-formative feedback. Similarly, the diverse specialisations represented may reveal discipline-specific variations in e-formative feedback practices and their effectiveness. As we present the qualitative findings, these demographic factors will be considered to provide a more nuanced interpretation of the data.

Key findings that emerged from the study were clustered according to the themes identified during the data analysis. These themes include the nature of e-formative feedback in emergency remote learning, the challenges first-year student teachers face when engaging with e-formative feedback, and the technological and pedagogical support needs for effectively implementing e-formative feedback in online learning environments. Verbatim quotes from participants represent the individual voices of those interviewed, and the findings from the LMS log analysis enhance the data.

5.1 The nature of e-formative feedback in emergency remote learning

When asked about the types of e-formative feedback that student teachers received during emergency remote learning, the data revealed that participants experienced a variety of feedback

methods. These methods aimed to help first-year students develop a deeper understanding of their subjects and navigate the challenges of online learning. Here is how they responded:

> "*I often receive audio feedback on my assignments. It's helpful because I can hear the instructor's tone and emphasis.*" **ST7**
>
> "*Our instructors use rubrics with detailed comments for each criterion. It helps me understand where I need to improve.*" **ST2**
>
> "*We have weekly online quizzes with immediate automated feedback. It's great for checking my understanding quickly.*" **ST11**
>
> "*Sometimes we get video feedback where the instructor walks through our work. It's almost like being in a face-to-face session.*" **ST4**
>
> "*Peer feedback is encouraged in our online discussion forums. It's interesting to see different perspectives from classmates.*" **ST9**
>
> "*I appreciate when instructors use track changes and comments in our submitted documents. It's very specific and clear.*" **ST15**

Our findings reveal that participants experienced a diverse range of e-formative feedback strategies within their online learning environment. The interviews highlighted several key forms of feedback that students found particularly beneficial. Students reported that audio feedback, which allowed them to hear their instructor's voice, facilitated a better understanding of the nuances of the feedback. Rubric-based feedback, accompanied by detailed comments aligned to specific criteria, enabled students to identify areas for improvement. Automated quiz feedback provided immediate responses, allowing students to swiftly assess their understanding of course material. Some instructors offered video feedback featuring walkthroughs of assignments, which students found particularly engaging and clear. Online discussion forums facilitated peer-to-peer feedback, presenting diverse perspectives on student work. Additionally, students appreciated inline document comments for their clarity and precision in delivering specific, contextual feedback within submitted documents.

Learning Management System (LMS) log analysis corroborated these interview findings and provided further insights into how students engaged with e-formative feedback. The log data indicated that students accessed audio and video feedback multiple times, suggesting that these formats encouraged repeated engagement. A longer duration was spent reviewing rubric-based feedback compared to other forms, indicating a deeper engagement with this feedback format. We observed peaks in LMS activity following the release of feedback, suggesting that students promptly acted on the feedback received. Interestingly, engagement with e-formative feedback varied by subject area, with more frequent access noted in subjects requiring iterative skill development.

These findings indicate that first-year students value and engage with diverse forms of e-formative feedback in the context of emergency remote learning. The combination of interview data and LMS logs provides a comprehensive picture not only of what students articulate regarding feedback but also of their actual interactions with it in practice. This multifaceted approach to e-formative feedback appears to support students' learning needs in various ways, from offering immediate clarification to encouraging deeper reflection on their work.

Moreover, the data suggest that these varied feedback strategies are fostering self-regulated learning among first-year students. By providing timely, accessible, and diverse forms of feedback, instructors are enabling students to take greater control of their learning process, even in the challenging context of emergency remote education.

5.2 Challenges first-year student teachers face when engaging with e-formative feedback

The data indicated a range of challenges encountered by participants when interacting with e-formative feedback during emergency remote learning. Among these challenges were technological barriers, difficulties in time management, and issues surrounding self-motivation within the online environment. This section elucidates the participants' perspectives on these challenges, supported by corroborating evidence from Learning Management System (LMS) logs.

> "*Sometimes I can't access the feedback due to poor internet connectivity. It's frustrating because I know it's there, but I can't get to it.*" **ST12**
>
> "*I find it hard to manage my time effectively to review and act on all the feedback we receive. There's so much coming from different courses.*" **ST6**
>
> "*Without face-to-face interactions, it's challenging to ask follow-up questions about the feedback. I miss the immediate clarification we could get in a physical classroom.*" *ST3*
>
> "*I struggle with motivation to engage deeply with feedback when I'm studying alone at home. It's easy to just skim over it.*" **ST18**
>
> "*Some feedback is too general or vague. I'm not always sure how to apply it to improve my work.*" **ST8**

Technological barriers emerged as a significant obstacle for many participants. As ST12 articulated, "Sometimes I can't access the feedback due to poor internet connectivity. It's frustrating because I know it's there, but I can't get to it." This sentiment was echoed by several other participants, underscoring the impact of digital inequity on students' ability to engage with e-formative feedback.

LMS logs corroborated these statements, revealing irregular access patterns for some students. For instance, students from rural areas or those reliant on mobile data exhibited sporadic login times and shorter session durations, often failing to complete the review of feedback materials.

Time management in the online environment posed another considerable challenge. ST6 noted, "I find it hard to manage my time effectively to review and act on all the feedback we receive. There's so much coming from different courses." The LMS data supported this assertion, indicating that many students accessed feedback for multiple courses within short time frames, potentially limiting their ability to engage deeply with each piece of feedback.

The absence of face-to-face interaction also presented difficulties. ST3 shared, "Without face-to-face interactions, it's challenging to ask follow-up questions about the feedback. I miss the immediate clarification we could get in a physical classroom." The LMS logs indicated minimal use of online discussion forums or chat features for seeking clarification on feedback, suggesting that students might not be fully utilising available online communication tools.

Self-motivation in the online environment emerged as another critical challenge. ST18 admitted, "I struggle with motivation to engage deeply with feedback when I'm studying alone at home. It's easy to just skim over it." LMS data indicated that while most students accessed feedback promptly after it was posted, the time spent engaging with the feedback varied considerably, with some students dedicating only a few minutes to review extensive feedback documents.

Lastly, the quality and specificity of feedback itself were sometimes problematic. ST8 mentioned, "Some feedback is too general or vague. I'm not always sure how to apply it to improve my work." While this aspect is difficult to quantify through LMS logs, we observed that students were less likely to revisit or spend time on feedback that lacked specific action points or detailed explanations.

These findings illustrate the complex challenges faced by first-year student teachers when engaging with e-formative feedback in emergency remote learning contexts. The combination of interview data and LMS logs provides insights into both the perceived difficulties and the actual patterns of

engagement, highlighting areas where additional support or alternative approaches may be necessary to enhance the effectiveness of e-formative feedback.

5.3 First-year student teachers' support needs for engaging with e-formative feedback

Extracts from the data underscore the necessity for both technological and pedagogical support to enhance the engagement of first-year student teachers with e-formative feedback. Investment in support structures is critical for maximising the benefits of e-formative feedback. When participants were queried about their experiences and beliefs regarding e-formative feedback in the context of emergency remote learning, their responses were as follows:

> "*We need more training on how to use the different feedback tools in the learning management system effectively.*" **ST5**
>
> "*It would be helpful to have tutorials on how to interpret and act on different types of e-feedback we receive.*" **ST14**
>
> "*I wish there were more opportunities for live Q&A sessions about the feedback we receive. It would help clarify things quickly.*" **ST10**
>
> "*Some guidance on how to manage and prioritize feedback from multiple courses would be really beneficial.*" **ST17**
>
> "*I think we need more support in developing self-motivation and self-regulation skills for online learning. It's very different from what we expected in our first year.*" **ST1**

Our data revealed that first-year student teachers require both technological and pedagogical support to enhance their engagement with e-formative feedback. When participants were questioned about their experiences and beliefs regarding e-formative feedback in emergency remote learning, their responses highlighted several key areas of need.

Many participants expressed a need for technical training. ST5 stated, "We need more training on how to use the different feedback tools in the learning management system effectively." This sentiment was echoed by several other participants, suggesting a widespread need for improved digital literacy skills specific to e-feedback tools. Learning Management System (LMS) log data supported this need, indicating that many students accessed feedback tools infrequently or inconsistently. For instance, we observed that features such as rubric viewers or annotation tools were often underutilised, even when instructors had provided feedback through these channels. Interpreting and acting on feedback also emerged as a significant area of need. ST14 suggested, "It would be helpful to have tutorials on how to interpret and act on different types of e-feedback we receive." This indicates that students struggle not only with accessing feedback but also with understanding and implementing it effectively.

The desire for more interactive feedback sessions was also prevalent. ST10 expressed, "I wish there were more opportunities for live Q&A sessions about the feedback we receive. It would help clarify things quickly." LMS logs showed limited use of synchronous communication tools for feedback discussions, suggesting that such opportunities were indeed rare or underutilised.

Time management and prioritisation of feedback across multiple courses emerged as another key challenge. ST17 noted, "Some guidance on how to manage and prioritise feedback from multiple courses would be really beneficial." LMS data corroborated this, showing that students often accessed feedback for multiple courses in quick succession, potentially limiting their ability to engage deeply with each piece of feedback.

Finally, participants highlighted the need for support in developing self-regulation skills for online learning. ST1 stated, "I think we need more support in developing self-motivation and self-regulation skills for online learning. It's very different from what we expected in our first year." LMS logs

revealed irregular patterns of engagement with course materials and feedback for many students, supporting this expressed need for better self-regulation strategies.

These findings indicate a need for comprehensive support for first-year student teachers to effectively engage with e-formative feedback in the online environment. The data suggest that this support should encompass technical training on using feedback tools within the LMS, guidance on interpreting and acting on various forms of e-feedback, more opportunities for synchronous, interactive feedback sessions, strategies for managing and prioritising feedback across multiple courses, and support in developing self-motivation and self-regulation skills for online learning. The combination of interview data and LMS logs provides a nuanced picture of the support needs of first-year student teachers, highlighting areas where targeted initiatives could significantly enhance the effectiveness of e-formative feedback in emergency remote learning contexts.

6. Discussion of the Findings

The discussion of the findings is presented thematically below in response to the research objectives outlined earlier.

6.1 Varied Experiences and Understanding of E-Formative Feedback

Our study revealed diverse experiences and understandings among first-year student teachers regarding the implementation and purpose of e-formative feedback. This observation aligns with Winstone et al.'s (2017) assertion that students' engagement with feedback can vary significantly based on their comprehension of its purpose and their capacity to act upon it. The aim of e-formative feedback is to assist learners in becoming self-regulated learners in digital environments (Gikandi et al., 2011); however, our findings indicate that this objective is not uniformly realised.

The diversity in experiences can be attributed to several factors. Firstly, the abrupt transition to emergency remote learning necessitated that both students and instructors adapt to new technologies and pedagogical approaches concurrently. This rapid shift likely contributed to inconsistencies in the implementation of e-formative feedback across different courses and instructors. Secondly, the varying levels of digital literacy among first-year students, as evidenced by our findings, suggested that some students were better equipped to engage with e-formative feedback than others. These variations in experience and understanding have significant implications for the effectiveness of e-formative feedback in emergency remote learning contexts. As Carless and Boud (2018) contend, students' ability to understand and utilise feedback effectively is crucial for their academic development. Our findings indicate a need for more explicit instruction and guidance on the purpose and utilisation of e-formative feedback, particularly for first-year students who are still developing their academic skills and adjusting to the expectations of higher education.

6.2 Diversity in e-formative feedback methods

The study revealed that e-formative feedback can be provided through various digital means, including audio comments, video explanations, rubrics with detailed digital annotations, and automated quiz feedback. These findings support Hattie and Timperley's (2007) conceptualisation of feedback as a multi-faceted process that can take various forms. The diversity of e-formative feedback methods observed also aligns with the Interactive Tutoring Feedback (ITF) model proposed by Narciss and Huth (2004), which emphasises the importance of feedback content, function, and presentation in online learning environments.

This diversity in feedback methods offers both opportunities and challenges. On one hand, it allows for a more personalised approach to feedback, catering to different learning styles and preferences. For instance, audio feedback might be more effective for auditory learners, while visual learners might benefit more from video explanations or annotated rubrics. This aligns with the principles of Universal Design for Learning (UDL), which advocates for multiple means of representation to

support diverse learners (Rose & Meyer, 2002). On the other hand, the variety of feedback methods could potentially overwhelm students, particularly those who are less technologically savvy or who struggle with self-regulation in online environments. This highlights the need for a balanced approach in implementing diverse feedback methods, coupled with adequate support and guidance for students on how to effectively engage with each type of feedback.

Moreover, the effectiveness of these diverse feedback methods may vary depending on the subject matter and specific learning objectives. For instance, automated quiz feedback might be more suitable for factual recall or basic concept checking, while more complex cognitive tasks might benefit from more detailed, personalised feedback through audio or video formats. This suggests that instructors need to carefully consider the alignment between feedback methods, learning objectives, and assessment tasks when designing their e-formative feedback strategies.

6.3 Impact of e-formative feedback quality

Our study emphasised the importance of providing constructive and detailed e-formative feedback to create a positive and effective online learning environment. This aligns with Evans' (2013) assertion that the quality of feedback significantly influences its effectiveness in supporting learning. Additionally, we discovered that e-formative feedback positively impacted virtual classroom communication, student engagement in online activities, and academic achievement across various subjects, thereby corroborating Nicol and Macfarlane-Dick's (2006) findings on the role of formative assessment in fostering self-regulation.

The quality of e-formative feedback emerged as a critical factor in its effectiveness. High-quality feedback, characterised by specificity, timeliness, and constructiveness, was associated with higher levels of student engagement and improved learning outcomes. This is consistent with Shute's (2008) principles of formative feedback, which emphasise the necessity of clear, specific, and goal-oriented feedback.

However, our findings also revealed challenges in consistently delivering high-quality feedback in the context of emergency remote learning. Factors such as increased workload for instructors, technical limitations, and the absence of face-to-face interactions contributed to variations in feedback quality. This underscores the need for institutions to provide support and resources for instructors to develop effective e-formative feedback practices, potentially through professional development programmes or the implementation of technology-enhanced feedback tools.

Furthermore, the positive impact of high-quality e-formative feedback on virtual classroom communication and student engagement highlights its potential role in fostering online learning communities. As Garrison et al. (2010) argue, the development of social presence in online learning environments is crucial for effective learning. Our findings suggest that well-implemented e-formative feedback can facilitate this by encouraging dialogue and interaction between students and instructors, even in the absence of face-to-face contact.

6.4 Gaps in support for e-formative assessment

While there is a general acceptance of the role of e-formative feedback in emergency remote teaching and learning, our study revealed a lack of a comprehensive programme that supports the theoretical and practical foundations of the e-formative assessment process. This gap in support aligns with Carless and Boud's (2018) call for the development of students' feedback literacy as an essential component of effective feedback practices.

The absence of a structured approach to e-formative assessment has several implications. Firstly, it results in inconsistent practices across different courses and instructors, leading to varied student experiences and potentially unequal learning outcomes. This inconsistency can be particularly challenging for first-year students who are still navigating the expectations of higher education.

Secondly, the lack of a comprehensive programme means that both students and instructors may not fully understand the potential of e-formative feedback in supporting learning. As Winstone and Carless (2020) argue, feedback literacy – the understanding of feedback processes and the ability to use feedback effectively – is crucial for both giving and receiving feedback. Our findings suggest that there is a need for explicit instruction and support in developing these skills in the context of emergency remote learning. Furthermore, the gap in support for e-formative assessment may be exacerbating existing inequalities in the digital learning environment. Students who are already technologically savvy or possess strong self-regulated learning skills may be better able to navigate and benefit from e-formative feedback, while those who struggle with these aspects may fall further behind. This aligns with concerns raised by Selwyn (2020) about the potential for digital technologies to reinforce rather than reduce educational inequalities.

To address these gaps, institutions need to develop comprehensive programmes that not only provide technical training on e-formative feedback tools but also foster a deeper understanding of feedback processes and their role in learning. This could involve workshops on feedback literacy, guidelines for effective e-formative feedback practices, and ongoing support for both students and instructors in implementing these practices.

6.5 Challenges in engaging with e-formative feedback

6.5.1 Technological barriers

One significant challenge identified was the lack of consistent access to technology and reliable internet connectivity. This finding echoes the conclusions of Hodges et al. (2020), who highlighted the technological challenges inherent in emergency remote teaching. The digital divide observed in our study underscores Selwyn's (2020) argument regarding the necessity to address digital inequities within online learning contexts. The technological barriers manifested in various ways, ranging from intermittent internet connections disrupting synchronous feedback sessions to difficulties in accessing or submitting assignments on learning management systems. These issues not only hindered the delivery and reception of e-formative feedback but also added an additional layer of stress and frustration for both students and instructors. Furthermore, the varying levels of access to technology among students raised concerns about equity in the learning experience. Students with limited access to devices or reliable internet connections were disadvantaged in their capacity to engage with e-formative feedback in a timely and consistent manner. This aligns with concerns raised by Czerniewicz et al. (2020) regarding the exacerbation of existing inequalities in higher education during the transition to emergency remote learning.

Addressing these technological barriers necessitates a multifaceted approach. Institutions should consider providing technological support, such as laptop loan programmes or internet subsidies, to students in need. Additionally, there is a requirement for flexibility in the delivery of e-formative feedback, offering both synchronous and asynchronous options to accommodate students with varying levels of technological access.

6.5.2 Interpretation and application of feedback

Another challenge identified was the difficulty some students experienced in interpreting and acting upon e-formative feedback without face-to-face interaction. This aligns with Boud and Molloy's (2013) emphasis on the importance of dialogue in feedback processes and suggests that e-formative feedback in emergency remote learning contexts may need to be more explicit and include guidance on how to utilise the feedback effectively. The absence of immediate clarification opportunities, which are often available in face-to-face settings, left some students struggling to comprehend and apply the feedback they received. This difficulty in interpretation can lead to a disconnect between the intended message of the feedback and its actual impact on student learning. Furthermore, the challenge of interpretation was compounded by the diverse forms of e-formative feedback employed.

While this diversity can be beneficial, as discussed earlier, it also necessitates that students develop new skills in decoding and applying feedback across different digital formats.

To address this challenge, there is a need for more scaffolded approaches to e-formative feedback. This could involve providing students with guidance on how to interpret different types of feedback, offering opportunities for follow-up questions or clarifications, and incorporating feedback literacy explicitly into the curriculum. As Sutton (2012) suggests, developing students' ability to understand and utilise feedback effectively is a crucial aspect of their academic development.

6.5.3 Self-regulation and motivation

While first-year student teachers generally appreciated e-formative feedback as an innovative pedagogical tool, its integration was hindered by factors such as limited digital literacy, time management challenges, and difficulties in self-motivation. These findings support Zimmerman's (2002) work on self-regulated learning, highlighting the additional challenges students encounter in developing these skills within online environments. The shift to emergency remote learning imposed greater demands on students' self-regulation skills. In the absence of the structure provided by regular face-to-face classes and immediate peer support, many students struggled to manage their time effectively, maintain motivation, and engage consistently with e-formative feedback. This aligns with research by Broadbent and Poon (2015), who found that self-regulation skills are particularly crucial for success in online learning environments.

Moreover, the challenges associated with self-regulation were often intertwined with issues of digital literacy. Students who were less proficient with digital learning tools frequently found it more difficult to remain organised and engaged in the online learning environment. This suggests a need for integrated approaches that simultaneously address both digital literacy and self-regulation skills.

The motivational challenges observed in our study further underscore the importance of designing e-formative feedback practices that are engaging and closely linked to students' learning goals. As Hattie and Timperley (2007) argue, feedback is most effective when it aids students in understanding their current position in the learning journey and the steps they need to take to progress. In the context of emergency remote learning, this may involve more frequent, bite-sized feedback opportunities that help students maintain a sense of progress and connection to their learning objectives.

6.6 Implications for higher education institutions

In light of these findings, it is imperative for higher education institutions to develop comprehensive strategies for the implementation of e-formative feedback in emergency remote learning contexts. Such strategies should address issues of technological access, provide training for both students and instructors on effective e-feedback practices, and consider the adaptation of content, function, and presentation of feedback to suit the online environment. This aligns with Salmon's (2013) five-stage model of online learning, which emphasises the necessity for structured support and scaffolding in digital learning environments.

Institutions should adopt a holistic approach that addresses not only the technical aspects of e-formative feedback but also the pedagogical and psychological dimensions. This could involve:

- Developing comprehensive digital literacy programmes for both students and staff.
- Implementing feedback literacy training as an integral component of the first-year curriculum.
- Providing ongoing technical and pedagogical support for instructors in the design and delivery of effective e-formative feedback.
- Creating guidelines and best practices for e-formative feedback that consider the diverse needs and circumstances of students.

- Investing in technologies that support diverse and accessible forms of e-formative feedback.
- Regularly assessing and addressing issues of digital equity within the student population.

By aligning these efforts with the principles of the ITF model and incorporating insights from the broader literature on feedback and online learning, institutions can work towards creating more effective and equitable e-formative feedback experiences for first-year student teachers in emergency remote learning situations. This approach not only addresses the immediate challenges posed by emergency remote learning but also has the potential to enhance the overall quality of teaching and learning in higher education as it evolves towards increasingly digital and flexible learning environments.

7. Conclusion and Recommendations

This paper aims to explore the role of e-formative feedback in teaching and learning for first-year student teachers, with a particular focus on the context of emergency remote instruction necessitated by the COVID-19 pandemic. Based on our findings from the literature and data, it is evident that e-formative feedback plays a crucial role in enhancing learner outcomes in online environments, especially during periods of disruption and rapid transition to digital learning platforms.

Our study reveals that while e-formative feedback offers significant potential for supporting student learning, its effective implementation faces numerous challenges. These challenges include inconsistent access to technology and reliable internet connectivity, difficulties in interpreting feedback without face-to-face interaction, and varying levels of digital literacy among both students and instructors. These issues were particularly acute in the context of emergency remote learning, where the sudden shift to online platforms exacerbated existing inequalities and created new barriers to effective teaching and learning.

To address these challenges, we propose the implementation of comprehensive e-formative feedback strategies tailored to the needs of first-year student teachers in online learning environments. Our recommendations include:

- Prioritising structured and ongoing digital literacy development for both students and instructors, with a focus on skills specific to engaging with and providing e-formative feedback.
- Developing capacity-building programmes that not only enhance technical skills but also foster an understanding of effective feedback practices in online contexts.
- Implementing strategies to build student capacity for effectively engaging with e-formative feedback, including guidance on interpreting and acting upon different forms of digital feedback.
- Providing relevant technological resources and support to both instructors and learners, ensuring equitable access to the tools necessary for effective e-formative feedback.
- Creating flexible feedback systems that can adapt to varying levels of technological access and digital literacy among students.

7.1 Implications of the study and research practice

This study reveals several implications for pedagogical practices and future research in the domain of e-formative feedback. Firstly, it elucidates the perceptions and utilisation of e-formative feedback by first-year student teachers, offering valuable insights that can inform the development of more effective feedback strategies within virtual classrooms. These insights may assist educators in refining their feedback approaches to better meet the needs of first-year student teachers in online learning environments, potentially enhancing student engagement, motivation, and overall learning outcomes.

Additionally, the study emphasises the necessity for enhanced support and training in digital literacy and feedback engagement skills for first-year student teachers. This underscores the critical role that comprehensive support programmes play within higher education institutions in ensuring the success of these initiatives. Furthermore, this research contributes to the expanding body of knowledge on e-formative feedback in higher education, particularly in contexts of emergency remote learning. It also opens new avenues for future investigations into the long-term impacts and evolving practices associated with e-formative feedback, suggesting a rich terrain for ongoing scholarly exploration.

7.2 Limitations of the study

While this study offers valuable insights, it is crucial to acknowledge its limitations:

- The research was conducted at a single institution, which may restrict the transferability of the results to other contexts. Future studies could investigate these issues across multiple institutions to provide a broader perspective.
- The study focused exclusively on first-year student teachers. The experiences of students in other years or disciplines may differ and warrant further investigation.
- The research was conducted during the initial phase of emergency remote learning due to the COVID-19 pandemic. As practices and perceptions may have evolved over time, follow-up studies could yield insights into long-term adaptations and changes in e-formative feedback practices.
- The study relied on self-reported data from interviews and LMS logs, which may not capture the full complexity of students' experiences with e-formative feedback. Future research could incorporate additional data collection methods to provide a more comprehensive picture.
- These limitations highlight opportunities for future research to build upon and expand the findings of this study, contributing to a more nuanced understanding of e-formative feedback practices in higher education, particularly in contexts of disruption and rapid transition to online learning.

8. Declarations

Authors contributions: Conceptualisation (R.M.S. & P.P.); Literature review (RMS&PP.); methodology (R.M.S. & P.P.); software (N/A); validation (P.P.); formal analysis (R.M.S. & P.P.); investigation (R.M.S. & P.P.); data curation (R.M.S. P.P.) drafting and preparation (R.M.S. & P.P.); review and editing (P.P.); supervision (P.P.); funding acquisition (N/A). All authors have read and approved the published version of the article.

Funding: This research did not receive any external funding.

Acknowledgements: We would like to thank the first-year students for their participation in this study.

Conflict Of Interest: Authors declare no conflict of interest.

Data Availability: Due to ethical considerations, the data cannot be made publicly available, but it is available from the corresponding author upon reasonable request.

References

Boud, D., & Molloy, E. (2013). Rethinking models of feedback for learning: The challenge of design. *Assessment & Evaluation in Higher Education*, *38*(6), 698–712. https://doi.org/10.1080/02602938.2012.691462

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education*, 27, 1–13. https://doi.org/10.1016/j.iheduc.2015.04.007

Carless, D., & Boud, D. (2018). The development of student feedback literacy: Enabling uptake of feedback. *Assessment & Evaluation in Higher Education*, *43*(8), 1315–1325. https://doi.org/10.1080/02602938.2018.1463354

Carrillo, C., & Flores, M. A. (2020). COVID-19 and teacher education: A literature review of online teaching and learning practices. *European Journal of Teacher Education*, *43*(4), 466-487. https://doi.org/10.1080/02619768.2020.1821184

Czerniewicz, L., Agherdien, N., Badenhorst, J., Belluigi, D., Chambers, T., Chili, M., de Villiers, M., Felix, A., Gachago, D., Gokhale, C., Ivala, E., Kramm, N., Madiba, M., Mistri, G., Mgqwashu, E., Pallitt, N., Prinsloo, P., Solomon, K., Strydom, S., ... Wissing, G. (2020). A wake-up call: Equity, inequality and Covid-19 emergency remote teaching and learning. *Postdigital Science and Education*, *2*(3), 946-967. https://doi.org/10.1007/s42438-020-00187-4

Dube, B. (2020). Rural online learning in the context of COVID-19 in South Africa: Evoking an inclusive education approach. *Multidisciplinary Journal of Educational Research*, *10*(2), 135–157. https://doi.org/10.17583/remie.2020.5607

Evans, C. (2013). Making sense of assessment feedback in higher education. *Review of Educational Research*, *83*(1), 70–120. https://doi.org/10.3102/0034654312474350

Flores, M. A., & Gago, M. (2020). Teacher education in times of COVID-19 pandemic in Portugal: National, institutional and pedagogical responses. *Journal of Education for Teaching*, *46*(4), 507-516. https://doi.org/10.1080/02607476.2020.1799709

Garrison, D. R., Anderson, T., & Archer, W. (2010). The first decade of the community of inquiry framework: A retrospective. *The Internet and Higher Education*, *13*(1-2), 5–9. https://doi.org/10.1016/j.iheduc.2009.10.003

Gikandi, J. W., Morrow, D., & Davis, N. E. (2011). Online formative assessment in higher education: A review of the literature. *Computers & Education*, *57*(4), 2333-2351. https://doi.org/10.1016/j.compedu.2011.06.004

Guangul, F. M., Suhail, A. H., Khalit, M. I., & Khidhir, B. A. (2020). Challenges of remote assessment in higher education in the context of COVID-19: A case study of Middle East College. *Educational Assessment, Evaluation and Accountability*, *32*, 519-535. https://doi.org/10.1007/s11092-020-09340-w

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81–112. https://doi.org/10.3102/003465430298487

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause Review*, *27*, 1–12.

Jansen, J., & Farmer-Phillips, K. (2021). The long-term impact of short-term responses to the COVID-19 pandemic in South African higher education. *Higher Education Research & Development*, *40*(5), 953-967. https://doi.org/10.1080/07294360.2021.1909029

Mhlanga, D., & Moloi, T. (2020). COVID-19 and the digital transformation of education: What are we learning on 4IR in South Africa? *Education Sciences*, *10*(7), 180. https://doi.org/10.3390/educsci10070180

Motala, S., & Menon, K. (2020). In search of the 'new normal': Reflections on teaching and learning during Covid-19 in a South African university. *Southern African Review of Education*, *26*(1), 80-99.

Mpungose, C. B. (2020). Emergent transition from face-to-face to online learning in a South African University in the context of the Coronavirus pandemic. *Humanities and Social Sciences Communications*, *7*(1), 1-9. https://doi.org/10.1057/s41599-020-00603-x

Muhuro, P., & Kang'ethe, S. M. (2021). Prospects and pitfalls associated with implementing blended learning in rural-based higher education institutions in Southern Africa. *Perspectives in Education*, *39*(1), 427-441. https://doi.org/10.18820/2519593X/pie.v39.i1.26

Narciss, S., & Huth, K. (2004). How to design informative tutoring feedback for multimedia learning. In H. M. Niegemann, D. Leutner, & R. Brünken (Eds.), *Instructional design for multimedia learning* (pp. 181–195). Münster, Germany: Waxmann.

Ngubane-Mokiwa, S. A. (2020). Information and communication technology as a learning tool: Experiences of students with blindness. *African Journal of Disability*, *9*, 1-7. https://doi.org/10.4102/ajod.v9i0.647

Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education*, *31*(2), 199–218. https://doi.org/10.1080/03075070600572090

Ramrathan, L. (2020). School curriculum in South Africa in the Covid-19 context: An opportunity for education for relevance. *Prospects*, *51*, 383-392. https://doi.org/10.1007/s11125-020-09490-1

Rose, D. H., & Meyer, A. (2002). *Teaching every student in the digital age: Universal design for learning*. Association for Supervision and Curriculum Development.

Salmon, G. (2013). *E-tivities: The key to active online learning* (2nd ed.). Routledge.

Selwyn, N. (2020). Online learning: Rethinking teachers' 'digital competence' in light of COVID-19. *Education and Technology*, 1–3. https://doi.org/10.1080/17439884.2020.1802893

Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research*, *78*(1), 153–189. https://doi.org/10.3102/0034654307313795

Shute, V. J., & Rahimi, S. (2017). Review of computer-based assessment for learning in elementary and secondary education. *Journal of Computer Assisted Learning*, *33*(1), 1-19. https://doi.org/10.1111/jcal.12172

Songca, R. N., Ndebele, C., & Mbodila, M. (2021). Mitigating the implications of COVID-19 on the academic project at Walter Sisulu University in South Africa: A proposed framework for emergency remote teaching and learning. *Journal of Student Affairs in Africa*, *9*(1), 41-60. https://doi.org/10.24085/jsaa.v9i1.1427

Sutton, P. (2012). Conceptualising feedback literacy: Knowing, being, and acting. *Innovations in Education and Teaching International*, *49*(1), 31–40. https://doi.org/10.1080/14703297.2012.647781

Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing & Health Sciences*, *15*(3), 398-405. https://doi.org/10.1111/nhs.12048

van der Zanden, P. J., Denessen, E., Cillessen, A. H., & Meijer, P. C. (2018). Domains and predictors of first-year student success: A systematic review. *Educational Research Review*, *23*, 57-77. https://doi.org/10.1016/j.edurev.2018.01.001

Winstone, N. E., Nash, R. A., Parker, M., & Rowntree, J. (2017). Supporting learners' agentic engagement with feedback: A systematic review and a taxonomy of recipience processes. *Educational Psychologist*, *52*(1), 17–37. https://doi.org/10.1080/00461520.2016.1207538

Winstone, N., & Boud, D. (2022). The need to disentangle assessment and feedback in higher education. *Studies in Higher Education*, *47*(3), 656-667. https://doi.org/10.1080/03075079.2020.1779687

Winstone, N., & Carless, D. (2020). *Designing effective feedback processes in higher education: A learning-focused approach*. Routledge.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, *41*(2), 64-70. https://doi.org/10.1207/s15430421tip4102_2

positions of ERRCD Forum and/or its editor(s). ERRCD Forum and its editor(s) expressly disclaim responsibility for any damages to persons or property arising from any ideas, methods, instructions, or products referenced in the content.