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Synergy between Formative Feedback and Leaner Support: Enhancing E-Learning and Validity of Online Assessment in Higher Education

Joyce W. Gikandi

Department of Educational Management and Curriculum Studies

Mount Kenya University, Kenya

https://orcid.org/0000-0001-8531-6212

Email: jwgikandi@mku.ac.ke

Abstract: This paper is a systematic review that focuses on analysis and interpretation of related literature with an aim to enhance understanding of how convergence of formative feedback and leaner support enhances e-learning. In particular, the review sought to establish how convergence of formative feedback and adequate learner support as part of embedded online assessment that can contribute to meaningful experiences in e-learning. This focus aligns with the need to reconsider the core issues that undermine validity of assessment in online contexts with the aim to achieve the needs of competence-based learning in higher education. This review offers the distinction between validity within the context of assessment for learning and assessment of learning. Specifically, the paper exemplifies two of the key characteristics of validity of assessment namely, interactive formative feedback and learners' support within in elearning contexts. Based on a unified conception of validity, this paper illuminates how integration of interactive formative feedback and learner support converge to enhance assessment for learning in e-learning.

Keywords: Assessment for learning; E-learning; Formative Feedback, Learner support; Meaningful online learning, Validity of online assessment

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1. Introduction

This paper offers a systematic review that focuses on analysis and interpretation related literature with an aim to enhance understanding of validity in online assessment. The review sought to establish the core characteristics of validity in embedded assessment as part of classroom assessment that can contribute to meaningful online learning. In particular, the key research question in this paper is to establish how convergence of formative feedback and adequate learner support as part of embedded online assessment can contribute to meaningful experiences in e-learning. This focus underscores the need to reconsider the core issues that undermine validity of assessment in online contexts and development of desirable competences in higher education. This will also contribute towards filling the gap of limited understanding on what qualifies as effective formative assessment in elearning. This is relevant because, while many educators and researchers are cognizant of the uniqueness of assessing learning in online classroom, limited solutions have been established to adequately address the new pedagogical requirements and potential challenges. To exhaustively answer the research question based on review objective, each of the key empirical studies was read and reviewed in depth to draw relevant inferences from their findings. This systematic analysis considers relevant literature as revealed by key themes emerging from the reviewed articles. In the same vein, the methodological approaches, underlying theoretical perspectives and other context-specific aspects of each of the key studies are taken into the consideration towards enhancing the insights emerging from the reviewed research. In writing the review, the strengths and weaknesses associated with the key themes were considered while drawing inferences from the key results, implications and conclusions of each empirical study. In addition, the relevant themes and implications for practice emerging from all the reviewed articles were keenly considered and integrated guided by the central themes derived from the reviewed empirical studies

2. Literature Review

Previous research has shown that effectively designed learning environment is essential for meaningful learning to occur. Meaningful learning in this context is conceptualized as learning that is robust and transferable to real-life professional contexts (Archambault et al., 2022; Fiock, 2020; Lara et al., 2020). Similarly, monitoring of leaners' progress and formative assessment (*assessment for learning*) is a key component in designing desirable online learning environment for facilitating meaningful learning.

One of the key viewpoints being advanced in this paper is that appropriate levels of validity necessitate innovative course design in which online educators seamlessly integrate assessment within teaching and learning process. Building on recent research in online contexts (Archambault et al., 2022; Gikandi, 2021; Sara et al., 2023), this paper takes a particular focus on formative feedback and learner support as key aspects of assessment for learning in online higher education. Centred on the unique dimensions that characterize online settings, the author explores validity based on the distinctive nature of interactivity in online learning environments as compared to face-to-face settings. In online settings, there are unique facets in relation to the ways interactivity occurs among the teacher, peers and content (Archambault et al., 2022; Baran et al., 2011; Gikandi et al., 2011; Cox et al., 2015; Martin et al., 2019; Simon, 2019).

Empirical research within online learning contexts has also shown that learner and assessment centred dimensions are antecedent to knowledge centeredness, which is the key goal in higher education. However, fundamental requirements of formative assessment need to be addressed in order to realize desirable outcomes (Baleni, 2015; Lara et al., 2020; Morris et al., 2021; Sara et al., 2023; Simon; 2019). These requirements include effectively designed learning environment that is characterized by interactive formative feedback and sustained learning support (Gikandi 2021). Previous research further emphasizes the need to carefully reconsider the issues associated with validity of assessment in online settings in order to achieve competence-based learning (Ahmed & Sidiq, 2023); Gikandi, 2019).

Validity in assessment for learning is defined as the degree to which the assessment activities and processes promote further learning. This conception is based on the fundamental idea that the purpose of ongoing formative assessment characterized by interactive formative feedback and sustained learner support is to facilitate meaningful learning engagement. In defining validity within the context of assessment for learning, Hargreaves (2007) further stated, "validity of an assessment for learning depends on how far the interpretation and use of the assessment actually leads to further learning" (p. 186). This implies that by just designing assessment intended to serve formative purposes does not make it more valid; instead, assessment for learning must stimulate a high level of the desired learning. Black and Wiliam (2009) reinforced this by articulating the difference between intended use and results in relation to realizing the purpose of assessment (formative or summative). As such, it is necessary to ensure that the evidence obtained is used in a way that fits the intended purpose of assessment (providing adequate feedback and learner support) thus addressing the issues associated with validity of assessment. The following sub-sections focuses on review of existing research guided by the key themes in this paper: Formative feedback and learner support.

2.1 Formative feedback

Formative feedback is one of the core characteristics of validity of assessment in online setting that was evident in the reviewed studies. The following sub-elements emerged as relevant variables in contributing to the quality of formative feedback: Peer formative feedback; self-assessment; interactive collaboration and progressive development of a learning community; ongoing documentation and sharing of learning and assessment processes and products; and shared responsibilities and ownership.

The findings of previous studies have shown that formative feedback processes can offer adequate opportunities for learners to share their own ideas and artefact, monitor, interact with peers' ideas and review their artefacts. In turn, such opportunities stimulate learners to provide constructive formative feedback to their peers (Gikandi & Morrow, 2016; Wang et al., 2022). Evidence in reviewed studies further show that students benefit in giving and receiving feedback to/from peers on their completed artefacts (Gikandi & Morrow, 2016; Nortvig et al., 2018; Simon, 2019). Self-assessment is an emergent element that was also evident within the peer formative feedback processes in varying ways. The analytical rubrics support students to formatively self-assess as well as assess their peers' work and provide critical formative feedback (Gikandi & Morrow, 2016; Gikandi, 2021; Cox et al., 2015; Rodrigues et al., 2019; Simon, 2019). This illustrates an overlap between peer formative feedback and selfassessment. Effective formative feedback processes greatly foster reflective learning and stimulated students to purposefully monitor and formatively assess their own and peers' learning.

Based on the reviewed studies, formative feedback processes enhance formative feedback. This is stimulated through purposefully designing for interactive collaborations. Based on the reviewed studies, the interactive collaboration emerging through the formative assessment processes within the online discourse should be purposefully facilitated by online course teachers (Baleni, 2015; Gikandi & Morrow, 2016; Kilis & Yildirim, 2019). The teacher's role in enhancing the quality of online formative feedback is underscored in various empirical studies (Cole et al., 2017; Elbasri et al., 2018; Gurley, 2018; Kilis & Yildirim, 2019; Kyei-Blankson et al., 2016; Richardson et al., 2015). Based on these studies, the teacher should explicitly encourage and emphasize the value of learning collaboratively, where students are actively engaged as co-participants within the asynchronous discourse.

As previous studies' findings show, collaborative learning is underscored as one of the key strategies for facilitating online learning, and its formative assessment (Eden et al., 2024; Gikandi & Morrow, 2016). The literature also indicate that online environments provide enhanced opportunities for students to respond or question the views of their peers, hence formative peer feedback. One way in which online environments enable such opportunities is through asynchronous threaded discussions, which in turn stimulated self-assessment by allowing students to have adequate time to reflect on their thoughts about their understanding of content and/or views of other participants.

The reviewed studies illustrate that development of a learning community can reciprocally nurture formative feedback processes. The sense of learning within a strong community bound by shared goals and purpose fosters reflective interactivity within the online discourse (Eden et al., 2024; Gikandi & Morrow, 2016; Gikandi, 2019; Simon, 2019). Moreover, a supportive learning community can greatly enhance opportunities for interactive formative feedback processes through eliciting meaningful dialogue as students inherently connected to and shared their existing knowledge, and lived experiences as professionals (Dyer et al., 2018; Elbasri et al., 2018; Fiock, 2020; Kilis & Yildirim, 2019; Martin et al., 2019). The diverse and

contextualized perspectives immensely enrich and expand opportunities for critical formative feedback that supported students to enrich their understanding of content and expected outcomes (Elbasri et al., 2018; Fiock, 2020; Kilis & Yildirim, 2019).

Additionally, it is notable that ongoing documentation and sharing of learning and assessment processes and products enhances formative feedback processes. This suggests ongoing documentation is one of the key requirements for effective embedded assessment within online contexts (Gikandi and Morrow, 2016; Simon, 2019). In the reviewed empirical studies, this technique provides unique and enriched opportunities (as compared to face-to-face settings) for ongoing monitoring, assessment and formative feedback in various ways (Gikandi, 2019; Gikandi & Morrow, 2016; Sara et al, 2023). Firstly, a key aspect is how ongoing documentation, and sharing enables the course participants to refer to previous contributions within the online discourse. This aspect increasingly enhances formative feedback processes as the students had adequate opportunities to engage with themselves as they reviewed and internalized the feedback from others. Secondly, it offers students adequate time to review and reflect upon others' thinking, compose their ideas and in turn offer deeply thought peer feedback. Thirdly, such opportunities also serve an important purpose particularly in informing formative feedback processes and enabling students' ongoing work to serve as exemplars to peers. Fourthly, the ongoing sharing including publicity of learning needs and received feedback enhances effectiveness and efficiency of feedback as the students benefited both cognitively and affectively from their peers' feedback environments (Baleni, 2015; Elbasri et al., 2018; Fiock, 2020; Kilis & Yildirim, 2019). Fifth, ongoing documentation of evidence of learning offered the teachers enriched opportunities to engage with and reflect upon students' progress and evidence of learning and in turn provide adequate formative feedback (Gikandi & Morrow, 2016).

Moreover, the teachers' role as an expert facilitator including their involvement in ensuring efficacy within the collaborative formative feedback processes, encouraging active participation, direct guidance enrich the online learning discourse as they offer mentorship, expansive ideas and probes (Cole et al., 2017; Eden et al., 2024; Elbasri et al., 2018; Gurley, 2018; Rensburg, 2018; Simon, 2019). Based on the literature, this is mainly manifested by how the teacher offers reflective summaries and weaving of the asynchronous discussions. This implies that online teachers must establish sustained ways to offer timely feedback effectively in a manner that fosters deep inquiry (Baleni, 2015; Kilis & Yildirim, 2019; Gikandi & Morrow, 2016). This in turn fosters learning processes in ways that enrich shared meanings and ownership, and interactivity within formative feedback processes.

2.2 Learner support

Learner support in online learning settings is characterized by 3 key sub-elements: Shared understanding of learning goals and expected outcomes; reconstruction of teachers and learners' role in the learning and assessment processes; and the teacher's role as an expert in technical support and moderation of the online discourse. As the literature indicates, shared understanding of learning goals and expected outcomes ensures efficacy within formative processes in a way that stimulates dynamic interactions and fosters learning support (Cox et al., 2015; Elbasri et al., 2018; Fiock, 2020; Kilis & Yildirim, 2019; Ladyshewsky, 2013; Nortvig et al., 2018; Vonderwell & Boboc, 2013).

One strategy towards enhancing learning support in online courses is through the teacher purposefully designing for shared responsibility (Gikandi & Morrow, 2016; Gikandi, 2019; Simon, 2019). Within the shared responsibilities, the teacher and learners' roles are reconstructed to assume new roles as facilitators and coparticipants (Gikandi & Morrow, 2016; He et al., 2019; Kwon et al., 2021). The teacher's presence and leadership therefore play a critical role of effective facilitation and learner support especially in ensuring efficacy within shared responsibility (Cox et al., 2015; Elbasri et al., 2018 Kilis & Yildirim, 2019). Sustained learning support fosters strong positive online identity which fosters self-efficacy and motivation. Learner motivation in online learning is integral to sustained and meaningful engagement (He et al., 2019; Rensburg, 2018; Simon, 2019; Wang et al., 2022).

Based on previous studies, teacher's role as the expert guide on technical support and moderator of the online discourse is an important element. Appropriate technical support, teacher's mentorship and moderation of the discourse are precursor to productive engagement in online settings (Gikandi, 2021; Su & Guo, 2021). Appropriate level of leaner support promotes effectiveness of formative feedback focuses processes and products of learning. As well, this also facilitates self-regulatory processes among the students. Selfregulated learning refers to "an active constructive process whereby learners set goals for their learning and monitor, regulate and control their cognition, motivation, and behaviour, guided by their goals and the contextual features of the environment (Jin et al., 2023). Self-regulation creates a learner and assessment centred focus where the teacher becomes a facilitator as opposed to an expert, and learners assume a more active role (Gikandi & Morrow, 2016; Gikandi, 2021; Jin et al., 2023; Kwon et al., 2021). This can foster shared purpose and responsibilities among learners and the teacher in provision of formative feedback. Selfregulation and shared roles are critical requirements particularly in online learning environments where learners are expected to assume primary responsibility for their learning (Jin et al., 2023).

The following section offers a review of related theories to enhance understanding of the role of formative feedback and learner support in e-learning contexts.

2.3 Review of related theoretical perspectives

This work is based on the concept of learning within a social context which subscribes to Vygotsky's (1978) theory of zone of proximal development (ZPD) that is underpinned by the concept of scaffolding learning through interactions with others. This also aligns with Lave and Wenger (1991) social learning theory that underscores the need for learner-centred focus as an essential feature for situated learning in which teachers or educators are viewed as co-participants and facilitators as opposed to experts. Lave and Wenger views on 'situatedness' also suggest that meaningful learning occurs when learners are engaged actively in performing authentic activities that reflect real-world practices within a learning community in which both the course teacher and peers are perceived as key learning resources.

Exemplifying the centrality of social interactivity and collaborations in online assessment, Gikandi (2015) conceptualized formative assessment as sustained engagement with authentic assessment activities within a 'collaborative zone of proximal development' in which the teacher and peers are key source of interactive formative feedback. Interactions in this case relates to equality, continuity, collaboration, and reciprocity as a learning community that is bound by common goals in a particular domain (Clark, 2010; Eden et al., 2024; Kyei-Blankson et al., 2016; Fiock, 2020; Richardson et al., 2015). Such interactions lead to processes that stimulate learners to make their thinking visible to others, apply and share their existing knowledge and experiences, provide peers with feedback, and mutually learn from peers' ideas (Hattie & Timperly, 2007; Gikandi & Morrow, 2016; Wang et al., 2022).

3. Methodology

This paper focuses on review and interpretation of the findings of related literature with an aim to elucidate how feedback and learner support as core characteristics of embedded formative assessment can contribute to meaningful experiences in e-learning contexts. Systematic review approach was adopted in identifying and reviewing related literature (Creswell, 2013). The review was therefore guided by a clearly defined question and provides an in-depth analysis of evidence from relevant literature, which informs the inferences offered in this paper. The author therefore applied explicit criteria to search, select, analyze, and synthesize the relevant literature. This systematic review mainly adopts a qualitative interpretive approach which enabled an in-depth exploration of the review objective.

In searching for the relevant literature, the author targeted published articles focusing embedded assessment within online contexts in higher education. Inclusion criteria were established by using relevant search terms and phrases which included online formative assessment. Embedded assessment: assessment for learning, formative feedback, learner support in online education, Meaningful engagement in e-learning, Validity of assessment in higher education. Using these terms, a systematic search was carried within leading electronic databases including the Educational Resource Information Center (ERIC), Education Research Complete, ProQuest, Science Direct and Google Scholar.

To ensure an exhaustive review, the search inclusion criteria was bound within higher education e-learning contexts and within the last 12 years in which advancement and widespread use of educational digital technologies has grown rapidly. In terms of exclusion criteria, peer-reviewed Journal articles were considered as the key source of literature in order to ensure quality of the review. In addition, one doctoral thesis and a few (4) peer-reviewed book articles that met inclusion criteria were selectively considered as relevant sources: two book chapters on related empirical research (Gikandi, 2019), one chapter on relevant theoretical perspectives (Gikandi, 2015), and the fourth one is an authoritative book on classical related literature (Bransford et al., 2000). Further searches were accomplished through backward referencing after which careful selection process was carried out. The search process continued until the search could not reveal any new relevant articles without introducing redundancy. In total, 49 articles were identified as relevant although the extent of their relevance varied in relation to the themes they captured and whether the studies had substantial focus on online courses or were only limited to blended learning. Retrieved articles were clustered based on inclusion criteria to enable a systematic review.

In reviewing the selected articles, scanning was done, organizing the articles according to their date of publication while considering the relevance of themes captured. Selected articles were further categorized as primary (empirical) studies and secondary sources, giving preference to peer reviewed studies in the last 10 years (from 2013-2024). To enhance the depth and breadth of the review, 8 other empirical studies from year 2008 – 2012 were carefully selected and included because of their close relevance in terms of the richness of the themes that emerged from them during the review process.

The author reviewed the selected articles guided by the objective of this review, where themes emerging from each article were noted to identify those articles whose focus revealed relevant themes that the authors had identified as central to the concept of validity in higher education assessment and within e-learning contexts. The key emerging themes related to validity in embedded assessment were: Interactive formative feedback, and learner support within online courses.

Majority of the reviewed articles were peer-reviewed empirical studies in online learning context, while one had focus on both blended and online contexts. Some of the reviewed studies were based on fundamental learning theories and conceptual perspectives. Most of the key studies in this review adopted qualitative biased approach and case study methodology that informed an in-depth review of how the embedded assessment facilitated meaningful learning experiences within online courses. These key studies offer recent evidence on relevant themes and characteristics related to validity within online courses, namely: authenticity and learner autonomy, formative feedback, multi-dimensionality and sustained learner support.

To exhaustively answer the research question, each of the key empirical studies was read and reviewed in depth to draw relevant inferences from their findings. This systematic analysis considered the key focus of reviewed articles, methodological approaches, underlying theoretical perspectives and other contextspecific aspects of each of the key studies. In writing the literature review findings, the strengths and weaknesses associated within aspects were considered while drawing inferences from the key findings, implications and conclusions of each empirical study. In addition, the relevant themes and implications for practice emerging from the other reviewed articles were keenly considered and integrated guided by the central themes derived from the key empirical studies.

4. Results and Discussion

Guided by the key themes that were presented in the literature review, the results and discussion are offered in this section. The following key characteristics were identified as core elements of meaningful learning and its assessment in online learning settings: Interactive formative feedback, and learner support. This implies that meaningful online learning and effective *assessment for leaning* (formative assessment) requires integration of these key elements within the teaching and learning processes.

4.1 Formative feedback

Based on the reviewed literature, the following subelements emerged as relevant themes (variables) that contribute to the quality of formative feedback: Peer formative feedback; self-assessment; interactive collaborations and progressive development of a learning community; ongoing documentation and sharing of learning and assessment processes and products; and shared responsibilities and ownership. These sub-elements reveal some overlap and have synergetic relationship in the sense that they complement each other and/or they enrich one another.

Utilization of ubiquitous online tools including web 3.0 tools can enable opportunities for ongoing documentation, dynamic interactivity and assessment of the evidence of learning in ways that also stimulate active learners' involvement in ongoing self-assessment and peer-peer formative feedback processes. This in turn increases the quality of formative feedback in terms of its immediacy, interactivity and adequacy. Peer formative feedback is therefore one of the most crucial dimensions of formative feedback processes (Wang et al., 2022). For instance, the students' participation and interactions with peers within the asynchronous online discussion forums can facilitate peer-peer feedback as learners share their understanding within a social Such interactive collaborations context. elicit constructive responses from/to peers (peer-peer formative feedback). These findings confirm that educators and/or course designers can purposefully utilize affordances of dynamic web-based ICT and mobile tools for synchronous and asynchronous interactions towards enhancing formative feedback processes (Gikandi & Morrow, 2016; Nortvig et al., 2018; Peculea & Peculea, 2019).

The results of this study illustrate that peer formative feedback processes for instance through learning collaboratively can trigger self-assessment and support students to enhance their learning and achievements. The synergy between self and peer formative assessment is therefore an emergent outcome within formative feedback processes (Gikandi & Morrow, 2016; Gikandi, 2021; Cox et al., 2015; Rodrigues et al., 2019; Simon, 2019' Wang et al., 2022). For instance, the use of open online reflective journals as part of self-assessment can provide learners with opportunities to interact with both the teacher and peers within individual reflective processes.

The results also reveal effective formative feedback processes. Opportunities for peer-peer feedback are facilitated in ways that enhanced interactivity, multidimensionality and immediacy of feedback (Jensen et al., 2021; Wang et al, 2022). It is evident that various techniques fostered peer formative feedback processes in ways that stimulated active engagement, reflectivity and self-regulated learning (Nicol, 2019). One of the core techniques that facilitates peer feedback is collaborative asynchronous discussion forums within which the students negotiated understanding within a social context as they articulated their own understandings, comparing their perspectives with those of peers, while receiving and/or giving feedback from/to peers (Eden et al., 2024; Gikandi & Morrow, 2016; Mackaveya & Cronb, 2019; Martin et al., 2019; Simon, 2019). In the end, individual learners were able to build new interpretive frameworks through adopting perspectives that were meaningful and relevant to their own contexts. This confirms the findings of previous

studies which demonstrated peer formative feedback and assessment as a form of collaborative learning which provide students with opportunities to interactively develop new knowledge as they compare their understandings (Baleni, 2015; Eden et al., 2024; Kilis & Yildirim, 2019; Sara et al., 2023).

The formative feedback processes also stimulated learners to self- assess, self-regulate and revise their learning strategies in order to achieve desired performances. The current study results shows that feedback among peers was characterized by immediacy and interactivity, which is an important aspect in stimulating self-regulated learning (Elbasri et al., 2018; Jensen et al., 2021; Jin et al., 2023; Nicol, 2019). Peer feedback also supported contextual learning as students were able to discern from peer artefacts aspects that were relevant to their own context. Moreover, peer-peer feedback promoted reflective thinking as the students sought to justify their comments within their feedback to peers. Furthermore, in relation to being feedback recipient, it supported self- assessment and disposition towards self-improvement as students articulated their position and justified their ideas and/or decisions as well as in acknowledging peer feedback. This finding concurs with the findings of various researchers (Gikandi & Morrow, 2016; Dyer et al., 2018; Fiock, 2020; Martin et al., 2019; Pentucci & Laici, 2023) who demonstrated that peer-peer feedback promoted reflective thinking as the students sought to justify their ideas within peer-peer feedback processes.

It is important to note that online learning environments offers opportunities that enhance the quality of peer formative feedback. Based on the findings of the reviewed studies, distinctive aspects of quality and effectiveness of peer feedback processes were the immediacy, inherent interactivity and mutuality (Jensen et al., 2021; Wang et al., 2022). More importantly, learners recognized and valued their peers as source of valuable feedback, which reveal increased uptake of peer feedback. The eventual uptake of feedback by the receiver has been identified as key characteristic that culminate the effectiveness of formative feedback (Gikandi & Morrow, 2016; Gikandi, 2021; Simon, 2019). Consistent with these studies, dynamic dialogue within feedback processes supported the learners to better understand the feedback and use it to improve their achievements in relation to the learning goals and expected outcomes.

The ongoing documentation and openness of learning and assessment processes and products also increased the uptake of peer-peer feedback as it enabled the students to make their thinking visible to others through articulating their strengths and needs. These aspects reveal the importance of ongoing documentation and publicity of assessment processes and products in enhancing formative feedback in ways that promote meaningful dialogue, reflectivity and self-regulation (Gikandi & Morrow, 2016; Jin et al., 2023). These aspects are particularly critical in online higher education (Kilis & Yildirim, 2019; Nortvig et al., 2018; Peculea & Peculea, 2019).

The results of this study underscore the critical teacher's role in enhancing the quality of online formative feedback (Baleni, 2015; Gikandi and Morrow, 2016; Kilis & Yildirim, 2019). This implies that formative feedback is purposefully designed for in online courses It is important to note that teachers in the reviewed empirical studies recognized and valued that their students were coming to their online classrooms with previous knowledge and experiences. The teachers' pedagogical philosophies influence the way they designed their respective course to support their students to actively participate and engage meaningfully with others (particularly the teacher and peers) in developing learning resources and opportunities for both individual and group learning. Online teachers should have dispositions that reveal a sense of constructivism, collaborative knowledge building and connectedness to authentic situations (Gikandi & Morrow, 2016). Despite the shared responsibilities and ownership within the formative feedback processes, it is important to note that this does not diminish the role of the teacher as an expert in course content and a lead facilitator with more authority (Gikandi, 2019; Richardson et al., 2015; Simon, 2019).

4.2 Learner support

As evidenced in the results of this study, the teachers play a key role in offering learner support through ongoing expert guidance and modelling. This is especially in relation to understanding the expected learning and assessments outcomes. To facilitate adequate learner support, teachers should provide diverse opportunities and foster shared role within learning and formative feedback processes (Kwon et al., 2021; Pentucci & Laici, 2023; Sara et al., 2023). This supports learners to monitor and assess their own progress and achievements. Additionally, students should be adequately supported to develop appropriate learning strategies and enhance their achievements over time.

Learner support in online learning has been underscored as critical aspect that influences student engagement and success in e-learning settings (Babacan & Thurgood, 2021; He et al., 2019). Learner support is characterized by 3 sub-elements: Shared understanding of learning goals and expected outcomes; reconstruction of teachers and learners' role in the learning and assessment processes, and the teacher's role as the expert guide on technical support and moderator of the online discourse. Sustained interactivity and the sense of shared responsibility fosters the development of an interactive and supportive online learning community (Dyer et al., 2018; Eden et al., 2024; Kilis & Yildirim, 2019; Nortvig et al., 2018; Pentucci & Laici, 2023). Reviewed studies exemplify that the online course teachers need to explicitly foster shared purpose and responsibility which in turn stimulates students' active engagement in self-assessment as well as source of learning support and feedback to their peers' work.

Additionally, the current study results show that properly coordinated shared responsibilities, support the learners to increasingly develop mutual responsibility and recognized themselves as source of learning support for their peers, which in turn enhanced the formative processes particularly in relation to increasing the immediacy and interactivity of formative feedback (Gikandi & Morrow, 2016; Gikandi 2019; Jensen et al., 2021; Simon, 2019). As well, peer learning and support fosters identify formation and a sense of belonging among the learners as members of a learning community. By implication, this calls for the teachers' vigilance in order to effectively facilitate shared responsibilities within learner support and formative feedback processes. As aforementioned, based Lave and Wenger (1991) social learning perspectives, meaningful learning occurs when learners are engaged within a supportive learning community in which both teacher and peers are perceived as key learning resources.

Moreover, the relevance of teacher's role as the expert guide in technical support and moderation of the online discourse is underscored in this study (Gikandi, 2021). Moreover, it is also important to note that effective leaner support helps to enhance formative feedback processes and learning outcomes. Teachers should also adopt a holistic and personalized feedback approach as part of learner support, which in turn facilitates an inclusive learning environment (Eden et al., 2024). Therefore, these elements form a synergy that enhances validity of online formative assessment (Baleni, 2015; Gikandi, 2019; He et al., 2019). Based on the results of this study, effective formative feedback processes and adequate learner support promotes leaner motivation and self-regulation (Baleni, 2015; Fiock, 2020; Gikandi & Morrow, 2016; Kyei-Blankson et al., 2016; Nortvig et al., 2018; Peculea & Peculea, 2019).

5. Conclusion and Recommendations

5.1 Conclusion

As articulated through this paper, it is also evident that the aspects of formative feedback and learner support if appropriately facilitated form a synergy. These aspects are particularly overlapping within the context of online learning and its formative assessment. Based on the results of this study, it can be further inferred that effective formative feedback processes within assessment activities discourage surface learning and dishonesty issues because the students are supported to develop dispositions towards meaningful engagement and self-regulation.

As a key element of formative feedback, effective peer formative feedback can create effective online learning environments where learners are actively engaged meaningfully in ways that stimulate sustained interactions and self-assessment. These aspects are critical dispositions for successful online higher education. Such learning experiences can foster deep learning and enhanced learners' ability to self-regulate and develop transferable knowledge and skills. Of great importance is recognition of how distinctive characteristics of online settings can extend opportunities for meaningful interactivity and reflectivity within ongoing assessment and formative feedback processes. This is particularly through enriched opportunities for ongoing documentation and monitoring of evidence of learning, which in turn increased the uptake of formative feedback and its effectiveness.

Despite the benefits discussed thus far, it is also important to note that failure to adequately address all the variables discussed is a threat to validity of online assessment. This would comprise the identified benefits in relation to achieving meaningful learning and effective assessment in online higher education.

5.2 Recommendations

Through this study on review of related literature, various recommendations are offered.

- 1. Firstly, it is now agreeable that effective assessment in e-learning setting calls for effectiveness and efficiency of formative feedback processes. For this to occur, the shared role in provision of feedback is necessary. This implies creating opportunities for interactive collaborations and peer-peer formative feedback in order to activate the learners as a key learning resource for sustained active engagement.
- 2. Secondly, effective e-learning and its assessment calls for online educators to exploit the potential of online settings in supporting peer formative feedback through designing for learner and assessment centered environments that focus on shared purpose and responsibility as opposed to teacher-centered environments. It is therefore crucial for online educators to go beyond offering facilities for peer-peer feedback and underpin the design of online courses on shared meaning necessary for facilitating shared purpose and authenticity, which is an influential element in learners' perceptions about the value of learning collaboratively and engaging in peer-peer formative feedback processes.
- 3. Thirdly, meaningful engagement also requires educators to guide and support learners in managing opportunities learner autonomy and choice of relevant activities. This implies that teacher's ongoing guidance and feedback is vital in enabling learners to focus on expected

learning outcomes while also fostering multidimensional perspectives and selfregulated learning. In the same vein, flexibility within assessment guidelines and rubrics based on shared understanding of expected outcomes and emerging needs is also crucial.

4. The insights from this paper also have implications for future research. Acknowledging that the reviewed studies were conducted within specific e-learning settings, there is need to conduct further research in other diverse settings in order to confirm the findings from this review study.

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