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Using E-Portfolios as an Integrated-Workflow Teaching Method and Tool in Open Distance Electronic Learning (ODeL).

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Abstract
An e-portfolio is a pedagogical tool that integrates educational paradigms such as self-regulated learning, and a competency-based approach. It is primarily used as a summative assessment to document and showcase evidence of the learning and skills acquired by students. Teaching in an open-distance electronic learning environment entails co-constructing knowledge with students through connectivism and information communication tools. Regrettably, online students are more concerned about the grades they get for assessment activities than about learning the content. This researcher adopted an interpretive approach to understand how participants utilize e-portfolios for teaching and learning through formative assessment activities. A qualitative study was conducted by way of a designed e-portfolio checklist and semi-structured interviews. Ten participants formatively assessing their students using e-portfolios were conveniently chosen for semi-structured interviews. The findings of this study suggest that administering formative assessment activities through e-portfolios encourages self-directed learning. The participants designed formative assessment activities for the e-portfolio to facilitate students' engagement with the content, measure their knowledge and skills, and determine their competency. These lecturers facilitated co-teaching and co-learning through collaborative tasks and online tools such as blogs, social media, YouTube, and discussion forums. This study concludes that the e-portfolio can be used as a teaching methodology to facilitate student engagement and online learning because it is a competency-based and student-centered assessment tool for online modules and courses. It is recommended that lecturers also design practical tasks to improve their content delivery and assessment practices.

Keywords: *e-portfolio, integrated working, formative assessment, teaching methodology*

Introduction

As Learning should encourage students to succeed, complete their tasks, and learn. It is, after all, more than just receiving a certificate. Students can gather evidence and explain how it relates to the desired capability. They can access contemporary teaching techniques if lecturers encourage initiatives spreading knowledge about scientific research (Duong et al., 2021). Undergraduate modules should include teaching through digital electronics so that students acquire digital skills. Online education was adopted by corporate strategists and motivated by the automation of teaching to achieve greater efficiency in education (Atiaja et al., 2018). Teaching and assessment

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in an online environment have different tools to ensure that the learning process encourages participation and interaction not only between students themselves, but also between students and their lecturers.

The researcher observed that students at the University of South Africa (UNISA), which offers higher education via open-distance electronic learning (ODeL), pay little attention to the learning process and material and instead concentrate on their assessment tasks and their grades. This researcher has received numerous e-mails from students who had just registered and received their study material asking: "*Which learning units to read for assignment 1?"*. This suggests that students want to read only the parts related to the questions for the assessment activity and not to read for learning. With such an attitude, they will not acquire the knowledge and skills required to pass the module. Their assessment marks usually indicate if students have read to answer the questions or to fully understand. Moreover, learning through digital technologies does not provide students with strategies, skills, and methods (Duong et al., 2021). Literature suggests that digital tools for collaborative learning are lacking. This researcher has observed that ODeL institutions use discussion forums mainly for non-graded assessment. Because of the lack of tools to facilitate team-based learning, this author suggests the use of e-portfolios for teaching and learning (Ramos et al., 2018).

Currently, institutions of learning use e-portfolios as an alternative assessment tool to showcase the skills, capabilities, and learning students have acquired over a year. E-portfolios focus on students' learning and assessment or showcase their skills and achievements (Ring et al., 2015). The use of e-portfolios for formative assessment requires that all activities be linked to the content and learning outcomes. Gikandi et al. (2011) maintain that the effectiveness of online formative assessment tools is determined by their ability to provide informative and immediate feedback, foster engagement with critical learning processes, and promote equitable education.

This article argues that an e-portfolio is an integrated-workflow teaching method that is also student-based and competency-based. Ngui et al. (2020) argue that an e-portfolio is a valuable educational tool that captures and supports the interactive process of learning. It should not be used as an alternative assessment but as a learning tool to enhance student engagement. Teaching methods are the specific techniques for teaching and assessment. The curriculum should increase soft skills and promote group activities and the usage of language (Duong et al., 2021). Teaching methodology also involves group work activities. Active learning methodologies encourage the use of team-based learning to increase student engagement (Ramos et al., 2018). Content learning should offer opportunities to ask questions and space cognition and not offer opportunities to simply receive information (Atiaja et al., 2018). Through the module content, students acquire knowledge, competencies and abilities, and find reasons for action. Social interaction facilitates learning through a tool and pedagogy that motivate students to learn.

Any digital teaching tool requires a humanized approach that will increase interaction between students and between students and their lecturers. Discussion and formative assessment activities facilitate social interaction. Information communication technologies mediate the creation of an interpersonal learning context and allow the integral development of users. Because the focus should be not only on theory and assessment, but also on practice, online teaching methods for learning are needed. Research literature and the study on the use of e-portfolios for formative assessment to enhance efficacy in ODeL indicate a lack of online teaching and learning methodologies that increase student engagement and team-based learning. Consequently, the research question for this article is: *how do ODeL lecturers use e-portfolios as an integrated-workflow teaching methodology?*

Contextualization of the study

A larger study at an ODeL institution on the use of e-portfolios for formative assessment to enhance efficacy finds that e-portfolios can be used as a teaching methodology to enhance online learning because it enables student engagement through activities. According to Sanchez et al. (2019), students in the ODeL environment work on an online platform, also known as a Learning Management System (LMS), which is a virtual space for learning, together with other students through assessment activities. It is structured for reflection, collaborative learning, presenting evidence of learning and accomplishments, and giving feedback. ODeL institutions are expected to design study material that facilitates individual and collaborative online learning and assessment (Tryon & Bishop, 2019). There is a greater awareness of student-centered and lifelong learning, graduate attributes, and professional development both locally and internationally. Portfolios can report to specific academic fields or lifelong learning (Martins, 2021). At the ODeL university that formed part of this study, lecturers can choose between various forms of assessment. They are required to formatively assess

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students according to different strategies and the final mark must indicate competency or completion of a course. The choice is between online examinations, portfolios, e-portfolios, and continuous assessments. Assessment at the University of South Africa aims to improve the quality of students' learning experiences by focusing on significant knowledge, skills, attitudes, and values, and by motivating them to work through the material through tasks and feedback, which is also known as assessment for learning (UNISA, 2019). In OdeL, formative assessment provides contact, support, and structure to the learning process, whereas summative assessment serves to make informed academic decisions about students' competency. Daily, weekly, and monthly activities, which represent incremental learning, contribute not only to the development of students' learning (formative assessment) but also to their final marks (continuous assessment leading to summative assessment). Students are expected to learn from the formative assessment activities and attain the required skills. Therefore, any assessment tool must facilitate learning and demonstrate students' achievements and skills.

Theoretical framework

The theoretical foundations of a field not only describe and inform the practice, but also guide future developments. "A theoretical framework is a logically developed and connected set of concepts and premises developed from one or more theories that a researcher creates to scaffold a study" (Varpio et al., 2020, p. 989). Connectivism, the theoretical framework for this study, serves as an epistemological guide or an appraisal or evaluation tool to interpret the data. "Connectivism is a learning theory that emphasizes the importance of connections and networks in the process of acquiring knowledge" (Alam, 2023, p. 1; Davatgari Asl, H., Zoghi, M., & Rahmani, P. 2021.). It claims that knowledge is acquired not only by traditional means such as textbooks or lectures, but also through online communities, social media, and other technological platforms. Connectivism offers a new paradigm for learning based on the premise that knowledge is distributed across networks of people, technologies, and organizations. ODeL students draw on a variety of sources to do their assessment activities. This theory facilitates learner-centered instruction, which involves leveraging technology to access knowledge, creating connections, sharing knowledge, and valuing diversity and autonomy. According to Bower (2019), the fundamentals of technology-enhanced learning involve instructors and students who control the content that is represented and shared by means of technology. The operations and representations of the technology are a consequence of human action. Technology transports meanings across a network without manipulation or transformation to optimize student learning outcomes and experiences through the purposeful deployment of learning technologies. Thus, the network between participants influences the learning that takes place. One of the principles of connectivism includes that learning is based on a diversity of opinions and that connections are made to nodes, or information sources and involves human and non-human appliances. It involves the capacity to know more, see, build, and retain connections between fields, ideas, and concepts as well as accurate and current knowledge and decision-making about what to learn and to make meaning of incoming information (Atay & Sumuer, 2021; alenezi, T. 2020)

Literature review

Lecturers are expected to be innovative in their teaching, which involves using cutting-edge technology and creating activities that promote knowledge sharing, student support, and peer learning. They must select platforms to deliver module content so that students can learn. The e-portfolio facilitates communication between the educational process and students and allows students to communicate with their lecturers, peers, and the institution to improve instruction. An e-portfolio is a student-owned digital tool, a working and learning space for collecting, creating, sharing, collaborating, and reflecting on learning and competencies, as well as for storing assessment and evaluation (Shanaa et al., 2020). It involves all the activities performed during a year and is created for online platforms such as Google Sites, WordPress, and independent websites. An e-portfolio facilitates the acquisition of self-directed learning skills according to a student-centered approach that aids learning and triggers independent learning (Song, 2021). Students must take full responsibility for their learning by collecting important artefacts to demonstrate learning. The e-portfolio represents a shift from merely delivering content towards coaching and motivating students with a genuine interest in their disciplines, communities, and professions when they must solve problems (Aghazadeh & Soleimani, 2020). It makes learning more practical and teaches important content.

According to Roco and Barbera (2020), an e-portfolio is a pedagogical strategy that promotes learning by doing such as solving problems and completing assessments. They can be conducted by academics and peers. Students must be given self-assessment activities to improve their critical thinking. The e-portfolio is an active and student-centered

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learning tool (Masoud, 2020) loaded with content, learning outcomes, and assessment standards linked to each assessment activity. E-portfolios encourage reciprocal learning and peer assessment. They offer instant and instructive feedback and boost students' interactive and social skills. "An e-portfolio also employs 21st-century skills such as learning and innovation skills of creativity, critical thinking, problem-solving, communication, and collaboration" (Bangalan & Hopana, 2020, p.32). This suggests that it centers on learning and supports student-centered learning, reflection practices, and personalized forms of learning. By incrementing the individual path with pragmatic results (something that is not clear with a milestones system), an e-portfolio introduces a qualitative factor to the process resulting in better self- and external reflection on the individual's path(Martins, 2021)

The e-portfolio promotes collaborative learning, supports reflective thinking and learning, and helps students engage in more complex problem-solving techniques and discovery learning (Shanaa et al., 2020). Students can focus on how they use their critical thinking skills to solve key issues and revise their activities and knowledge. Instead of just downloading and adding information to their portfolios, students are expected to engage in deep-level learning and metacognitive control strategies (Handel et al., 2018). Learning becomes a discovery process instead of a passive assimilation of information. An e-portfolio not only facilitates access to knowledge but also assists instructors in their instructional planning and in designing authentic assignments by using engaging and active pedagogies and periodic self- and peer-and-teacher formative assessments (Aghazadeh & Soleimani, 2020). These features of the e-portfolio guide lecturers when they design their instruction.

Bangalan et al. (2020) regard an e-portfolio as a paradigm in constructivist e-learning because it can involve students in deep learning and, at the same time, serve as a way for both students and the institution to engage in assessment. Students are actively involved in the teaching and learning process through activities. This productive tool gives continuous feedback, points out weaknesses that need correction and constantly assesses the efficacy of tuition (Akhvelediani et al., 2020). Moreover, it discourages assessment at the end of a course and encourages formative assessment. Educational tools not only capture students' achievements but can also be used to support the interactive learning process, especially from the student's perspective (Ngui et al., 2020). The e-portfolio is a valuable educational tool owing to its ability to capture and support the learning process. In addition, it encourages students to work in small groups to discuss the course content and support each other.

Internal online tools such as discussion forums, announcements and blogs, give initial explanations and ensure that all learning materials are available from the start so that students can do their assignments on their own (Sanchez et al., 2019). A learning management system incorporates tools that increase student engagement and support. A systematic literature review by Harun et al. (2021) shows that student teachers learn how to teach thanks to their e-portfolios. Their e-portfolios can also be used to assess their learning of how to teach.

Successful e-portfolio implementation requires a platform for sharing experiences, giving PowerPoint presentations, notes, assignment tasks, points for group discussion, and reflection notes, and for peer evaluation. On this platform, users receive constructive feedback prompting self-reflection and the setting of upcoming directions (Ngui et al., 2020). Discussions between academics and students and between students themselves generate knowledge and an understanding of the topic.

E-portfolios are ideal for a blended-learning approach because they are designed to create a learning environment and develop students' cognitive skills such as critical thinking, problem-solving, and creative thinking (Koraneekij & Khlaisang, 2019). They create opportunities to share one's work and receive feedback from one's peers and instructors. Bouzeghala (2020) defines the e-portfolio as a purposeful framework and a learning method in which concepts are elaborated and designed to reflect on its users' achievement. E-portfolios create a more active, flexible, and digital learning environment and allows for the demonstration of different reflective instructional practices. An e-portfolio facilitates self-assessment of one's learning task performance by automatically offering performance standards information to measure students' current level of performance (Becker & Merrienboer, 2018). This could involve revision as a writing strategy to evaluate a text. Self-assessment is defined as a condition of students' autonomy in that they do not have to depend entirely on the opinion of their instructor if they evaluate themselves accurately (Yekta & Kana'ni, 2020). E-portfolios require students to think about what they have learned, identify gaps in their knowledge, and take remedial steps. Babaee (2020) asserts that an e-portfolio must be a popular pedagogical device in the higher education landscape because it can generate transformative knowledge. In addition, it is an interactive

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tool based on user-generated content and concepts (Martins, 2021)

Methodology

A research methodology facilitates logistics and plays a critical role in the interaction between the philosophy of science, theoretical perspective, and practice (Samanithan, 2020). Since this study's main objective was to describe how participants utilize e-portfolios to facilitate teaching through formative assessment and not to collect statistical data, qualitative techniques were chosen to conduct the study. Qualitative research collects data through interviews, observations, and analyses of the current documents to understand the views of participants (Antwi & Hamza, 2015). This researcher's perspective was interpretivism, which helped to interpret how participants use e-portfolios as an integrated-workflow teaching method. The interpretive paradigm seeks to make sense of the context and human experience (Kivunja & Kuyini, 2017). This case study was exploratory but also used different sources to collect data to generalize the use of the e-portfolio as an integrated-workflow teaching methodology. It was conducted at a South African distance education university. Ten lecturers who use e-portfolios for formative assessment were selected. Non-random sampling dictates purposive sampling to ensure information-rich participants (Ridder, 2017). The ten participants were conveniently and purposively selected for semi-structured interviews. Eight of them were from the College of Education, one was from the College of Economics and Management Sciences, and one was from the College of Agriculture and Environmental Sciences. The interviews were conducted on Microsoft Teams according to a semi-structured interview schedule. The e-portfolio checklist was designed by the researcher and was used to analyze e-portfolios set for students. This researcher adopted an interpretive approach to interpret how the participants used e-portfolios for teaching and learning through formative assessment activities. The way in which the lecturers from the three colleges used e-portfolios to teach was thematically analyzed. A thematic analysis helps to identify and analyze patterns in qualitative data and understand narrated experiences (Ngui, Hiew & Pang, 2020).

Findings

The following section presents the themes and sub-themes emerging from an analysis of the e-portfolio checklist and semi-structured interviews conducted with participants. Verbatim quotations will substantiate these themes and sub-themes. According to an e-portfolio checklist, the researcher evaluated the e-portfolios for the following modules: Instructional Studies in Context (ISC3701), Instructional Techniques and Multimedia in Adult Education (INTMAEU), which was presented online, and FET Subject Didactics Geography (SDGEOGM). The latter module teaches students to become competent Geography teachers against the background of outcomes-based education, Curriculum 2005 and Geography as a natural, a human and social science. Data was presented in a table and themes demonstrated how the findings addressed the objective of this study by answering the research question and defending the argument. Verbatim quotations support the findings. This interpretive process started with identifying key themes supported by verbatim quotations or views of participants to arrive at a proper interpretation in the form of a discussion, a conclusion, and recommendations (Smith, 2019).

E-Portfolio Checklist Data

The e-portfolios comprised different formal and informal tasks based on the learning outcomes of a module and were performed over a study year. Activities were for learning, not for grading (E-P for ISC370). The first task was meant to harness students' technological skills. Each task aligned with a certain learning outcome. Other tasks required students to share electronic videos, pictures, and PowerPoint presentations.

An e-portfolio is a course management tool to organize learning tools such as content, assignments, reading, and online quizzes. The lecturers used Panopto to record their lessons on their laptops and present them as attachments. YouTube videos and open electronic resources were also used to teach module content. Presentation software such as PowerPoint was integrated to share images, diagrams, graphs, videos, augmented text, and live recordings of content and instructions. E-portfolios also allowed for integrated online quizzes and social web activities as part of student assessment. Some formative assessment activities were graded, and others were not.

The lecturers set up the blog facility to initiate discussions. One activity required a blog post about the teaching philosophy statement from students. Another activity was about using technology for teaching and learning (EP for INTMAEU). Students were requested to form groups to discuss assignment questions and perform group work activities. Reflection activities taught student teachers to be reflective practitioners (E-P for SDGEOGM).

Integrated workflow teaching methodology

Participant C compared an e-portfolio to an online classroom since it integrates workflow learning and

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engages students through continuous assessment activities.

"The e-Portfolio facilitates a more classroom-based assessment but in an online platform." (Participant H)

The participants used e-portfolios as a learning methodology characterized by grading and knowledge-sharing activities. E-portfolio activities align with the learning outcomes and assessment standards of modules. According to the participants, assessment activities were dictated by the learning outcomes of a module and aligned with the assessment standards. Each assessment activity was designed to achieve a particular learning outcome.

"E-portfolio is an integrated workflow learning, online classroom, and students continuously (online and offline) work the e-portfolio, improve it until the last day." (Participant C)

"Every activity in the e-portfolio is dictated or guided by the learning outcomes of the module." (Participant C)

Content modules required students to reflect on every task they had completed. When they reflected on their tasks and the materials and feedback they had received, students were forced, as it were, to do self-assessment and self-evaluation. Because they were graded, students were compelled to reflect. Their reflection journals indicated whether students had learnt the module content, understood the activities, and were satisfied with the content delivery or not.

"*They must reflect on every activity completed and discussion, expressing feelings and understanding of the activity and content this gives me an idea of challenges and progress" (Participant C).*

Competency-based assessment tool

According to Participant F, an e-portfolio serves to determine students' competencies. Their e-portfolios also tested students' technical or technological skills (E-P for SDGEOGM). But students are often reluctant to participate because of their deficient digital skills and some data issues. The first activity orientated students to Mahara and e-portfolios and tested their technological skills by asking them to provide their personal information (biography). *"Technical skills are tested via asking to furnish the biography on the e-portfolio" (Participant I).* This information can be used to create social media teams for further discussion on Facebook and WhatsApp groups. Wikis are weekly activities developed online. Even though Mahara could not allow it, students used Google to develop them and the MyUnisa discussion forum to share and discuss them.

"E-portfolio activities test and specifically required students to acquire and sharpen their technical skills as well as forced them to learn module content" (Participant F).

E-portfolios encouraged reading and listening through online tools. Short links to articles and YouTube videos were embedded in documents to promote reading and engagement. Discussions were initiated by the lecturers who had ensured access to Open Electronic Resources (OER) and encouraged students to consult various sources of information to answer questions.

"To encourage reading, listening, and reading, YouTube videos and personal video clips are uploaded as extra material before discussion and other activities" (Participant C).

According to the participants, e-portfolios enhanced students' soft skills through reflection activities.

"...showcases students' achievement ... teaching practice modules use it as a tool to showcase student teaching abilities and competencies" (Participant I).

"EP enhances students' soft skills through reflection" (Participant J).

Student-centered online tools to facilitate co-teaching and co-learning

These academics used the e-portfolio for online discussions through Google meets Blog Posts, social media, and Wix. Discussion was initiated by means of links, questions for discussion forums and blog posts by lecturers. Students were also allowed to initiate discussions by way of blog posts. Online discussions are dictated by module content and learning outcomes and are meant for sharing knowledge.

"I chose the e-portfolio because of its ability to encourage and facilitate co-learning; connects students with the institution for lived experience" (Participant H).

Discussions ensure that students not only learn facts from a book, but also discuss them with their peers. They learn a great deal from each other because discussions are always open. Blog assignments were used to initiate discussion. They facilitated the interaction indispensable for constructing meaning and sharing ideas. Both lecturers and students used this formative assessment strategy to facilitate learning, assessment, and feedback through e-portfolios. Participants indicated that e-portfolio blogs allow for comments and feedback.

"E-portfolios increased student engagement (peer, lecturer, and students) (Participant C).

The use of creative online multimedia

Electronic PowerPoint presentations, recorded and YouTube videos, pictures, graphs, and diagrams dominated students' e-portfolios. These tools were used to demonstrate content, learning, and understanding of the

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module. Students were asked to plan and video record a lesson that had to be uploaded on their e-portfolios for formative assessment. Video recordings of lessons not only encouraged self-evaluation but also helped to identify gaps between lessons and learning.

"Students are required to design, and voice record the lesson, then upload it on the e-portfolio, thus encouraging self-evaluation to identify the gap between the lesson and learning" (Participant A).

"I also design self-assessment for students during the year to evaluate their learning" (Participant E).

Discussion

Formative assessment activities of the e-portfolio focused on different aspects of learning. According to Roco and Barbera (2020), an e-portfolio is a pedagogical strategy that adopts learning by doing, such as problem-solving and assessment processes. Students were expected to read up on a topic before they attempted the activities since formative assessment activities tested their content knowledge and sharpened their technical skills. Students are responsible for collecting and presenting evidence of learning. "An e-portfolio also employs 21st-century skills such as learning and innovation skills of creativity, critical thinking, problem-solving, communication, and collaboration" (Bangalan & Hopana, 2020, p.32). This suggests that e-portfolios are learning-centric and support student-centered learning, reflection practices, and personalized forms of learning. According to Bower (2019), the fundamentals of technology-enhanced learning involve instructors and students who control the content shared by technological means. The operations and representations of technology are a consequence of human action.

An e-portfolio can be used as a teaching methodology to enhance online learning because it is a student-centered assessment tool for online courses. It is a student-centered, active learning tool because it values reflection and develops metacognitive skills. E-portfolios became a learning method because they are an active and student-centered learning tool that is crucial in the learning and teaching process (Masoud, 2020). They are loaded with content, learning outcomes, and standards linked to each assessment activity. E-portfolios enhance students' soft skills through formative, non-graded assessment activities. Formative assessment activities involve interaction to strengthen students' feelings of connectedness and promote their engagement (Yao & Hoi, 2018). This study further argues that e-portfolios are student-centered because they focus on students' learning by allowing them to take full responsibility for their learning. E-portfolios facilitate the acquisition of self-directed learning skills through a student-centered approach that aids learning and triggers independent learning (Song, 2021). Students learn by doing research and applying their knowledge during assessment activities. E-portfolios enhance online teaching and learning through formative assessment activities and features such as feedback and reflection.

An e-portfolio facilitates online co-teaching and co-learning through activities promoting discussion, collaboration, and engagement. The act of teaching involves co-constructing knowledge with students (Devi, 2019). Online discussion forums are used to introduce content and stimulate discussion. Online teaching mainly involves posting in the discussion forum, which starts with an introduction of the lecturer and the module (Ko & Rossen, 2017). Students and lecturers used these online tools to initiate discussions based on module content. This is done by posting topics for discussions, questions for learning, and links for further reading. Online teaching involves posting in the discussion forum, which starts with the introduction of the lecturer and the module (Ko & Rossen, 2017). Students and lecturers used these online tools to initiate discussions based on module content. Collaborative tasks such as discussions and blog posts, were designed for creating and sharing knowledge. Online discussions, electronic presentations, tasks, and group work activities facilitate co-teaching and co-learning.

This study supports connectivism's claim that knowledge is acquired not only by traditional means such as textbooks or lectures, but also through online communities, social media, and other technological platforms. "Connectivism is a learning theory that emphasizes the importance of connections and networks in the process of acquiring knowledge" (Alam, 2023, p. 1). E-portfolios encourage and facilitate co-teaching and co-learning through collaborative activities and tools such as Blogs, Wix, Google Meet, Wikis, social media, and YouTube. These tools enable competency learning (Baque et al., 2020). E-portfolio settings allow for the use of creative online multimedia to facilitate electronic PowerPoint presentations, diagrams, pictures, and videos (both recorded and YouTube videos). It focuses on students' learning processes and digital technology enables them to create, share, and use information (Shanaa, Kharbut & Hamada, 2020). Electronic PowerPoint presentations, videos, pictures, graphs, and diagrams dominated students' e-portfolios. After the presentation, the students engage by giving feedback and asking questions to get clarity.

Conclusion and recommendations

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This study concludes that using e-portfolios to administer formative assessment activities tests not only students' content knowledge, but also their technical skills. Lecturers can use the e-portfolio as a teaching methodology because it is a competency-based and student-centered assessment tool for online modules and courses. Understanding connectivism as an online learning theory is critical in setting up assessment activities that require online collaboration. The online learning system also features social networking since students give their personal information to create discussion teams. Social networking facilitates online co-teaching and co-learning through discussion and collaboration, as well as student engagement with the learning management system. Collaborative tasks and blogs, social media, YouTube, and discussion forums are online tools that facilitate co-teaching and co-learning. The settings of the e-portfolio allow the use of external online multimedia to facilitate presentation. An e-portfolio encourages self-directed learning through formative assessment activities and enhances online learning because students work independently, which encourages discussion and peer learning, and also forces them to read. Lecturers can also use various assessment activities to achieve a learning outcome. An e-portfolio is an online assessment tool that encourages self-directed learning through formative assessment activities.

This study would like to suggest further research on the use of e-portfolios for practical learning such as teaching practice modules. It is also recommended that lecturers receive creative tasks to improve their content delivery and assessment practices. Their design activities should enhance the acquisition of knowledge, competencies, abilities, and social interaction. Learning should motivate students to achieve more than a mere certificate. Finally, further research on how e-portfolio activities can hone students' technical skills is recommended.

Limitations

The vague distinction between an e-portfolio and an online portfolio is a limitation of this study. As a result, lecturers could claim that they use an e-portfolio while they, in fact, use an online portfolio. This ambiguity confused many participants during the interviews and resulted in the small number of lecturers participating in this study.

Acknowledgments

The findings of this study are based on research conducted at three colleges of the University of South Africa. This study involved lecturers and fourth-year students. The ethics reference number for this study about the use of e-portfolios for formative assessment to enhance efficacy in ODeL is 2021/10/13/59040165/16/AM. The researcher is grateful to the participants who took the time to participate in the project and the university's editing team for editing this article.

Data Availability

The data supporting the findings of this study are available within the article and its supplementary material. Raw data supporting the findings can be shared as a link upon request.

Ethical Approval Declaration

"All procedures involving human participants in this study were conducted in accordance with the ethical standards set by applicable research guidelines and the principles of the 1964 Declaration of Helsinki and its subsequent amendments. Ethical approval was secured before the commencement of data collection."

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Data availability:-

The datasets generated and analysed during the current study will be available from the author upon reasonable request.

Consent for publication:-

I hereby provide consent for the publication of the manuscript detailed above.

Competing interests:-

The authors declare no competing interests

Abbreviations

- **ODeL:** Open Distance Electronic Learning. Formatting...
- **UNISA**: University of South Africa.
- **LMS**: Learning Management System.
- **ISC3701**: Instructional Studies in Context.
- **INTMAEU**: Instructional Techniques and Multimedia in Adult Education.
- **SDGEOGM**: FET Subject Didactics Geography.

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