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Innovative multimodal Open Distance e-Learning (ODeL) supervision practices for master's and doctoral candidates

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Abstract

Open Distance e-Learning (ODeL) is on the rise to cater to non-traditional students. However, the surge in master's and doctoral students opting for ODeL raises concerns about the quality and timely completion of degrees. Existing literature on student attrition in higher education indicates that both student-related factors and institutional variables significantly impact completion rates. Factors such as students' sense of connection or isolation, as well as institutional aspects like supervisor responsiveness to feedback and feedforward, contribute to student persistence. To address this early attrition and extended stays in postgraduate studies, a community of practice (CoP), comprising lecturers and master's and doctoral students was formed. The CoP employed the Social Learning Theory (SLT) approach to initiate collaborative partnerships designed to promote a research culture and explore alternative approaches to curb master's and doctoral late completion and attrition. This paper reports on a study undertaken to explore the experiences, perceptions and insights of master's and doctoral candidates regarding the implementation of innovative multimodal Open Distance e-Learning supervision practices. Grounded in SLT, the exploratory case study employed an open-ended questionnaire to gather data from the students participating in the support programme. The findings revealed the positive impact of innovative practices on candidates' academic development and overall research experience. The findings further demonstrated that virtual communication tools have significantly enhanced collaboration between candidates and supervisors, breaking down geographical barriers and facilitating real-time feedback and guidance. The innovative multimodal OdeL supervision practices gave master's and doctoral candidates flexibility and increased their learning engagement.

Keywords: community of practice; multimodal supervision; social learning theory; open distance e-learning.

Introduction and background

Many private and public South African tertiary institutions have recently adopted various versions of the Open Distance e-Learning (ODeL) model in order to accommodate the growing demand for lifelong learning more efficiently than residential programmes (Aluko et al., 2022). Despite the uptake of ODeL and high enrolment of master's and doctoral (M&D) candidates in South African universities, there is still a concern about the quality of students' results and timely completion (Matsolo et al., 2018). The literature indicates that both student-related antecedents (self-efficacy, sense of connection or isolation) and institutional variables (instructor responsiveness, feedback and feedforward) play a part in the persistence of postgraduate students (Burns, 2013; Tinto, 2017). Academic performance as well as work obligations, institutional difficulties and personal challenges also play a part in a student's decision to stay with or leave their postgraduate programmes (Rotem et al., 2021).

This paper contends that M&D supervision in the ODeL environment poses unique challenges, leading to high attrition rates and extended candidature time. In response to the challenges faced by postgraduate students in South Africa, a community of practice (CoP) comprising academics (postgraduate supervisors) and postgraduate students from the University of South Africa (Unisa), Durban University of Technology (DUT), North-West University and the University of Zululand (UNIZULU), was formed. The CoP employed the Social Learning Theory (SLT) approach to initiate a collaborative partnership. The partnership aimed to promote the research culture and explore alternative approaches to curbing M&D late completion and attrition. The specific methods used in this initiative were founded on active learning principles (Arruabarrenav et al., 2019) and comprised activities as illustrated in Figure 1.

Figure 1. Active Learning Activities

Although most of the challenges are institutional and socio-cultural, some students drop out or take longer to complete their qualifications due to situational, attitudinal, psychological and pedagogical challenges. This study aimed to understand innovative multimodal supervision practices that lead to successful graduation. The study this paper describes was carried out to explore the experiences of postgraduate students enrolled in South African universities who received multimodal support during their studies. To situate this study within the broader OdeL context, the next section highlights the meaning of ODeL followed by the theoretical basis of this study. Thirdly, it presents a review of the related literature focusing on multimodal supervision practices, followed by shared insights and developments in five South African universities, and finally, recommends the innovative multimodal ODeL supervision practices.

Open Distance e-Learning (ODeL)

The ODeL approach combines distance and e-learning with socially-just open education. Open education, according to Weller (2020), aims to widen access and participation by removing barriers to make formal learning accessible to all. The primary mediating

technologies for ODeL are digital technologies, primarily through online learning, which has witnessed exponential growth in recent years, and supplemented by mobile devices such as laptops and mobile phones.

The relative cost-effectiveness, flexibility and reach of online learning programmes appeal to non-traditional students. The non-traditional student is one for whom being a student is but one facet of their identity, and sometimes not the most important facet of their life (Mbati, 2019). The following are some characteristics of the non-traditional student:

Demographic
- Is an adult over the age of the average undergraduate student.
- Has a family in which they play a leading role (parenting either in partnership or alone).
- Works as a significant breadwinner.
- Caters to several dependents.
- Has many demands on his/her time.
- Is unable to gain access to conventional learning due to factors such as misaligned skills versus entry criteria; special needs; rigorous programme attendance regimen; social self-exclusion (discomfort in attending classes with differing age groups); and financial challenges.

Motivation for study
- Re-skilling related to current job.
- Re-skilling while employed to change jobs.

Desired complementary skills
- Compartmentalisation of multiple facets of their lives.
- Autonomous learner.
- Self-determination.
- Self-efficacy.
- Intrinsic motivation (Mbati, 2019).

The growth of online learning may be attributed to the advancement of educational technologies (Kentnor, 2015). Educational technology advancement has led to seamless communication in various formats in contexts that seek to reduce structural, financial or digital fluency impediments. With the development of educational technologies came emergent pedagogies (Lekhetho, 2021). These pedagogies may harness educational technology affordances which can positively impact student learning depending on how they are appropriated.

While online learning offers promise for higher education institutions, it infamously has a higher attrition rate than conventional approaches to teaching and learning. Abiddin and Ismail (2011) indicate that that the first year of online study is the point at which attrition rates are high. Potential reasons put forward for high attrition rates in online learning contexts vary from lack of financial aid (Qayyum et al., 2019) to a lack of motivation and the absence of a sense of belonging (Zahl, 2015;Tinto, 2017).

Adding to the understanding of postgraduate online student attrition is Lekhetho's (2021) study which sought to investigate student support provided to postgraduate students at the University of South Africa. Findings from the qualitative study revealed that despite the challenges the students experienced, robust supervisory support contributed to improved graduation rates (Lekhetho, 2021).

In the South African context, the history of a segregated unequal education system has repercussions that are evident today. Access, equity and participation remain a challenge to most of the historically disadvantaged sections of the population (Mzangwa and Dede, 2019). As a result, some postgraduate students struggle to complete their studies, and a large number of those who complete their qualifications do so over a longer than acceptable candidature period. Silinda and Brubacher (2016) carried out a mixed-method study on stress contributors among South African postgraduate students. Their study found two general sources of stress: 1) uncertainty about the research/writing process along with insufficient support from supervisors, and 2) difficulties with time management. Issues about relationships, health and finances were not as strongly related to overall stress (Silinda and Brubacher, 2016). A study carried out by Havenga and Sengane (2018), which sought to explore the challenges faced by postgraduate students, identified

three categories of challenges. The first category is personal challenges, the second is academic and institutional challenges, and the third is research-related challenges. The authors recommend that support should be offered to address these challenges (Havenga and Sengane, 2018).

Community of practice

To provide the broader areas of knowledge under ODeL supervision practices, this study used the CoP framework which, according to Jagasia et al. (2015, p. 2), was initiated by Lave and Wenger (1991) on situated learning and the accounts of actual working practices (insurance claims processing, photocopy machine repair, etc.) and followed up in the work of Etienne Wenger (1998) and Julian Orr (1996), among others. The CoP framework needed a multimodal approach due to having multiple research communities (supervisors, master's and doctoral candidates, those still in the proposal stage, and those writing dissertations and theses).

Wenger-Trayner and Wenger-Trayner (2014) view CoPs as communities formed by people who engage in a process of collective learning. A CoP comprises three defining characteristics. The first is that the community, whose members engage in joint activities and discussions, help each other and share information. They build relationships that enable them to learn from each other. The second is the domain, which has an identity defined by a shared domain of interest; and the third is the practice where they develop a shared repertoire of resources – experiences, stories, tools, ways of addressing recurring problems – in short, a shared practice. In the CoP, the practitioners share information and develop knowledge resulting from the members' engagement in joint practical activities and discussions (Wenger, 2011; Musteen et al., 2018) Similarly, social learning and interaction have shown gains in student learning (Westerlaken et al., 2019; Ogunsola and Adesakin, 2020). The gains achieved through social learning and interaction include behaviour modelling, role modelling and self-reflexivity on the participants' part (Dooley, 2020). It should, however, be noted that modelling is an intentional process during social learning as individuals make choices regarding what activities to model (Kendal et al., 2018).

Social Learning Theory

The CoP is also grounded in SLT as described by Kendal et al. (2018, 651): 'Learning that is facilitated by observation of, or interaction with, another individual or its products, is known as social learning'. Additionally, social learning proposes that learning occurs through observation, imitation and modelling of behaviour, attitudes and beliefs (Bijandi and Nabavi, 2011).

SLT has been used in a diverse range of fields from educational settings (Hussin et al., 2019) to criminal behaviour and violence (Garduno, 2019; Powers et al., 2020). Social learning can be seen as an adaptive response to stimuli. Adaptivity plays a role in social and cultural evolution. In their work on social learning amongst animals, Olsson et al. (2020) carried out a study across various animal species targeting the neural and computational systems of social learning. Their findings revealed that social learning follows the same principles as self-experienced value-based learning, including computations of prediction errors, and is implemented in brain circuits activated across task domains together with regions processing social information (Olsson et al., 2020). Adaptation in social learning is argued to be influenced by prestige bias (Jiménez and Mesoudi, 2019). Prestige bias in the social learning context refers to an adaptive strategy that is used by group members in choosing to learn from a prestigious member of the group (someone who has gained attention, respect and admiration for their success in some domain) (Brand et al., 2021). In the context of the multimodal supervision model, in addition to prestige bias directed towards supervisors who are facilitating learning activities, students may apply prestige bias in relation to their peers as they engage in peer group activities. This leads to the acquisition of adaptive skills and processes in modelling. This is in recognition of the role modelling plays in active learning projects. The projects may have elements of modelling followed by active learning activities, such as group discussions, case studies or peer assessments.

Visual forms play a role in social learning. As explained by Yilmaz et al., (2019), visual forms such as photographs, videos, posters and templates provide individual meanings to the observers, leading to visual and social learning. The multimodal resources used in the supervisory practices include both static and animated visual forms, which students may download and use as needed.

Multimodal supervision practices

Multimodal approaches to teaching are becoming more popular due to the opportunities they offer for personalised student-centred learning. The approaches impact the design of learning programmes using pedagogically rich designs. As expected, they also offer opportunities for individualised authentic assessment which is student-centred. Student-centred learning is shown to result in intrinsic motivation and metacognition (Veenman et al., 2006; Deci and Ryan, 2010; Carbonneau et al., 2012), which leads to a valuable learning experience.

Multimodal approaches to instructional design have been successfully applied across a number of educational disciplines. In the field of science, they have been used for meaning-making as content can be represented in various modes – mathematical, drawings, pictures, tables, graphs, gestures and written/verbal language (Yeo and Nielsen 2020). As reported by Li (2020), a study was carried out using semi-structured interviews and written narratives to investigate students' (pre-/in-service teachers') perceptions on the integration of multimodal projects. The findings indicated that multimodal approaches enhanced student-teachers' learning of content and their professional development (Li, 2020). In English as a Second Language teaching, multimodal approaches have been successfully used to foster multiliteracies among students (Cloonan, 2008; Reyes-Torres and Portalés Raga, 2020). This particular study furthers the understanding of multimodal approaches in online-learning postgraduate supervision.

Multimodal resources are used in ODeL courses and facilitate quality learning when used correctly. The appropriate use of these resources is known to keep students engaged and support the achievement of desired competencies and learning objectives. Additionally, paired with continuous assessment, practice and feedback, multimodal teaching methods can improve performance (Krause et al., 2016). In postgraduate supervision in ODeL, the use of appropriate technologies has the effect of meeting various students' needs and learning orientations. This characteristic of multimodal resource use aligns with open education by providing a menu of resources for learning, collaboration and interaction.

The multimodal Open Distance e-Learning supervision model

The CoP's *domain* is postgraduate supervision, and its *community* comprises supervisors, and master's and doctoral candidates (those still at the proposal stage and those writing dissertations and theses). Supervisors and master's and doctoral candidates share their experiences, stories, research materials and strategies for tackling research projects across two online platforms: Google and MS Teams classrooms. This arrangement accommodates students who exclusively use Google and those who rely on MS Teams, ensuring that identical content is available on both platforms. The model comprises eight phases, from pre-registration for a higher degree programme to research output production. The nine stages are pre-registration, research proposal, chapters 1 to 5, and publication.

Phase 1: Pre-registration

Before registering for their postgraduate studies, prospective students meet with potential supervisors from the various institutions within designated Google or MS Teams classrooms. Activities are planned and conducted within the virtual classroom setting. The aim of the activities at this phase of the supervision model is to introduce the students to postgraduate studies. Synchronous workshops are facilitated through MS Teams by a pre-set list of scholars, who introduce the students to elementary research processes and support students in developing research outlines, which is a pre-registration requirement in South African public universities. By the time the students proceed to registration, they have a clearer basic understanding of their research interest. Synchronous workshop modes through MS Teams are used in this phase, allowing for audio-visual displays and interactive engagement.

Phase 2: Research proposal

In the second phase of the model, the postgraduate students register at various universities across the country and are at the research proposal writing stage. At this crucial phase, the supervisors use the webinar mode to address the various aspects related to a sound research proposal. The students have access to templates stored in the MS Teams files repository (such as Table 1) which may be used to assist them in

developing arguments that support their proposals. Mind-mapping tools are used to help the students create visual links between the various aspects of their proposals.

Table 1. Template for a critical analysis of literature.

Critical Analysis Template					
Resource	Year research was conducted	Context of the research	Sample	Methodology	Findings/Results

The postgraduate students are expected to present their proposals to the CoP with further guidance from supervisors within the community. In addition to the webinar mode, conference designs are used for the student presentations. In addition to the content of their presentations, students are assisted with design ideas for their presentations and argumentation skills during this phase of the model.

Phase 3: Chapter 1

This phase typically focuses on the translation of the students' accepted research proposal into Chapter 1 of their dissertations.

Phase 4: Chapter 2

This phase is used to assist students who are carrying out literature searches for their research and critical analysis of the literature (which forms Chapter 2 of their project). The

students typically exhibit problems related to unsubstantiated claims, a lack of coherence, and the lack of a critical analysis of the literature. Downloadable templates (such as Table 1) and mind maps are used to improve cohesion via Teams Classrooms. Peer review sessions via Teams/Google Classroom are also used to support social learning.

Phase 5: Chapter 3

Phase 5 addresses the research methodology of the dissertation/thesis. At this point, some students still have difficulty understanding different research concepts. Collaborative discussions and video demonstrations via MS Teams are used to clarify research concepts and processes.

Phase 6: Chapter 4

Chapter 4 of the dissertation addresses the discussion of findings through cross-referencing findings/results to the literature. Collaborative discussions via MS Teams, demonstration videos in MS Teams channels and uploaded resources in Google and MS Teams classrooms are used to provide audio-visual experiences for the students.

Phase 7: Chapter 5

Students' main challenges at this stage include referring to purpose, objectives and findings; recommendations without conclusions; repetition of chapter 1 outlines and limited attention to their contribution to knowledge. Checklists are used for candidate peer presentations (conference approach) and peer review.

Phase 8: Writing retreat

Students are afforded the opportunity to write an article based on their dissertation/thesis by attending a research writing retreat which is an in-person event. The students receive guidance on scientific writing for publication from journal editors and academic writers. The phases, support given, tools and pedagogical affordances are summarised in Table 2.

Table 2. Innovative multimodal Open Distance e-Learning postgraduate supervision model.

Phase	Stage	Support	Tool	Technological Affordance
1	Pre-registration	Research process (general)	Google Classroom workshops calendar templates	Interaction and collaboration
2	Research proposal	Conference	Webinar, PowerPoint	Public speaking and presentation
3	Chapter 1	Research process (specific)	MS Teams classroom	Peer support and modelling
4	Chapter 2	Resources, mind maps, templates, peer review, and resources available in documents tabs in Teams (through channels)	Classroom MS Teams	Social learning, cognition
5	Chapter 3	Demonstrations, workshops	YouTube videos MS Teams channels	Observation, Active learning
6	Chapter 4	Demonstrations, workshops	YouTube videos MS Teams channels	Observation, Active learning
7	Chapter 5	Presentations and peer review	MS Teams and PowerPoint	logical thinking and cohesion
8	Publication	Writing retreat	In-person interaction	creating and publishing

The phases described in Table 2 also involve presentations made by students called research incubators, where they present their studies on Microsoft Teams and receive feedback from peers and supervisors. These sessions prepare them for presenting their studies at the annual M&D Conference, which takes place in October every year.

Methodology

This study employed a qualitative exploratory case study research design to explore how M&D candidates experienced multimodal supervision and gain insight into how they perceive and make sense of this type of supervision. Exploratory case studies, as noted by Baškarada (2014), are particularly well-suited to situations in which the researcher seeks to gain a deeper understanding of a phenomenon, explore new ideas or generate hypotheses for further research. They are more flexible and open-ended in nature, allowing for a qualitative exploration of the subject. As Yin (2017) attests, an exploratory case study is used to explore presumed causal links that are too complex for a survey or

experiment. The master's and doctoral candidates' experiences were collected through an open-ended questionnaire guided by the following research question: What are the lived experiences and perceptions of master's and doctoral candidates regarding the implementation of innovative multimodal ODeL supervision practices?

Ethical clearance was obtained from the university where the researchers are employed, and a clearance certificate, reference number 2021/08/11/90060288/34/AM, was obtained. Participants in this study used Google Classroom as one of the supervision support modalities, and the researchers posted the information sheet about this study together with the consent form for master's and doctoral candidates who were interested in participating in this study to sign. From 47 master's and doctoral candidates enrolled in the Google Classroom, the researchers received consent forms from nine participants.

The open-ended questions were sent to the nine participants who consented to participate in the study. The biographical data of the participants is presented in Figures 2 and 3.
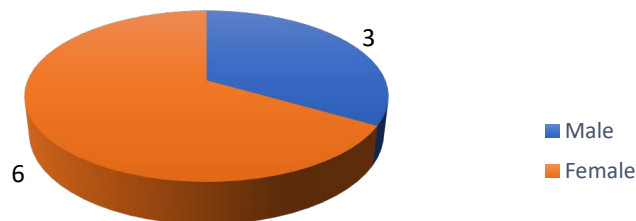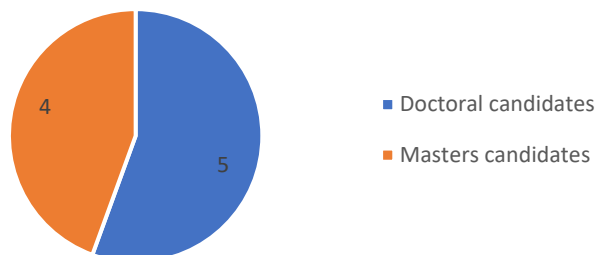
Figure 2. Gender.

Figure 3. Level of study.

By using open-ended questions in this study, the researchers allowed participants to share their perspectives in their own words, providing valuable insights and a deeper understanding of the innovative multimodal ODeL supervision practices under investigation. The open-ended questionnaire was considered necessary due to the physical distance between the researchers and the participants. The four questions below were sent to the participants, who were given two weeks to respond online.

1. How has the support offered by the M&D support workshops and classrooms influenced your behaviour regarding research?
2. Please explain any new behaviour you have adopted based on the support programmes.
3. How would you compare the use of your old/previous research behaviour with your learned research behaviour?
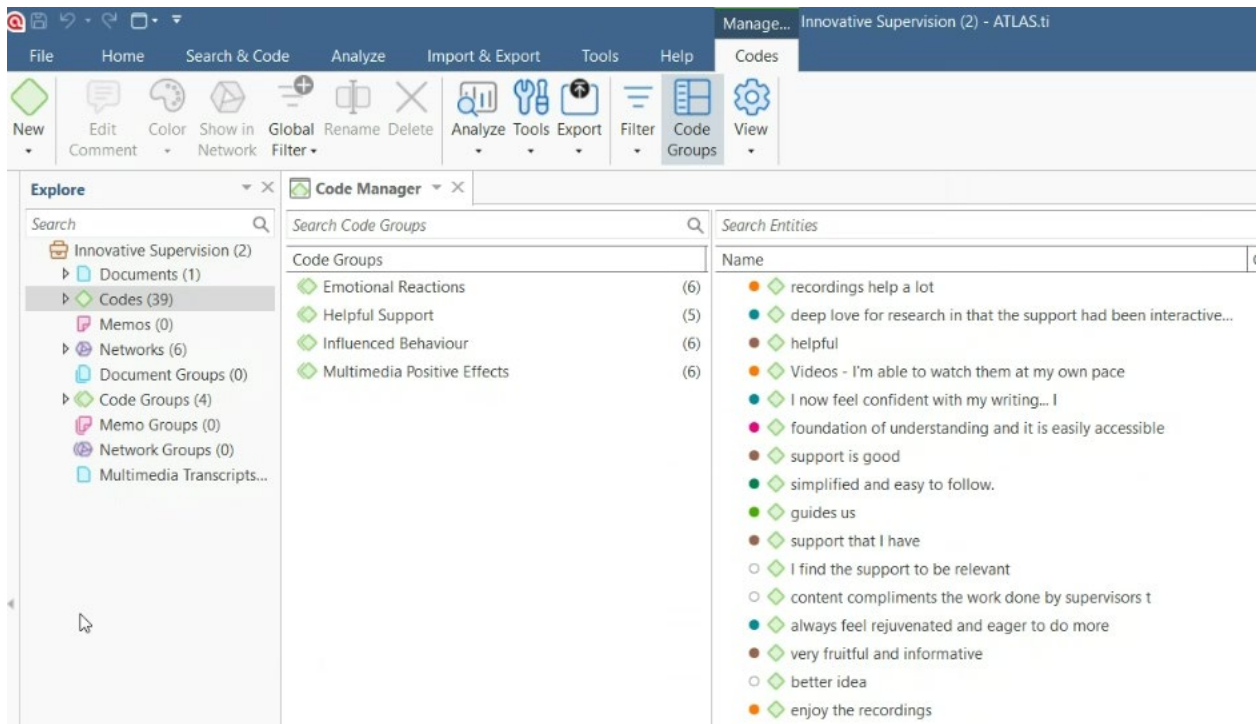4. Please explain the actions you take when you are requested to work collaboratively with your peers.

Data analysis

Since this study employed an exploratory case study research design, thematic analysis was used to analyse the data. According to Dawadi (2020) thematic analysis helps qualitative researchers to systematically organise and analyse complex data sets. Although this study's data set was not complex, it was necessary to use thematic analysis guided by Braun and Clarke's (2006) argument that describes thematic analysis as theoretically flexible for identifying, describing and interpreting patterns (themes) within a data set in great detail. Preparing the data for analysis in this study was an easy task because the data collected was in the form of text. The first part of the data analysis focused on the participants' biographical data, which are presented in Figures 2 and 3. Then the rest of the data were uploaded into Atlas.ti version 24 for coding and further analysis. The researchers used the issues, similarities and differences that were revealed in the participants' narratives and interpreted them through the lens of the theoretical framework underpinning this study to formulate codes. Thirty-nine codes were generated, which are presented in Figure 4. The interview questions were used to create the group codes as themes to present the findings.
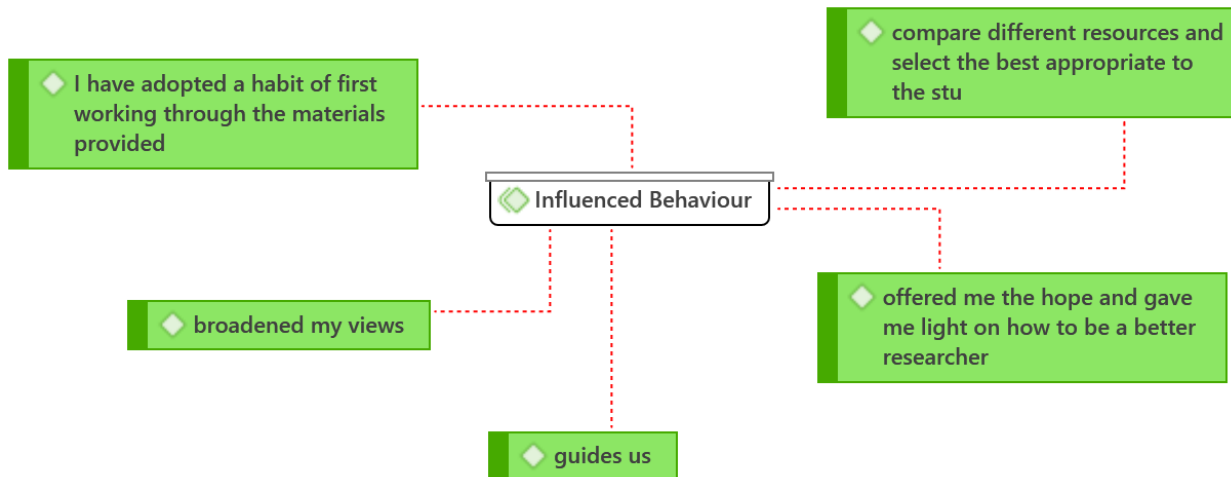
Findings

The findings of the study were categorised within four groups with the number of codes under each category (see Figure 4).

Figure 4. Codes.

Influenced behaviour

One of the main tenets of SLT is adaptation based on peers or instructors in learning settings. This was a prominent theme in the data collected. Adaptation occurred not only through individual modelling, but modelling behaviour in skills used in the selection of resources. In their study, Lind et al. (2019) report that genetic predispositions and associative processes can give rise to a wide variety of social learning. The following quotations illustrate the associated skills used in learning tasks. 'I have adopted a habit of first working through the materials provided' (Participant 9). Participant 6 highlighted that she learned to read a lot and further said 'I compare different resources and select the most appropriate'.
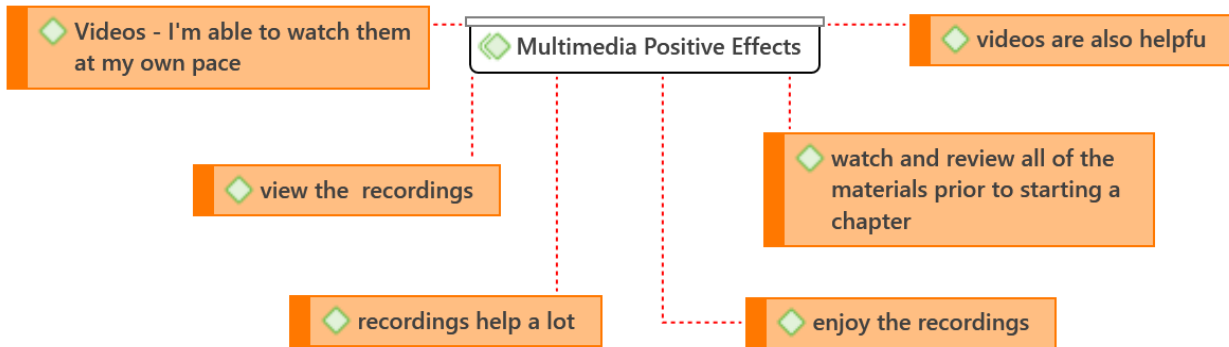
Figure 5. Summary of influenced behaviour.

It can be seen in Figure 5 that most participants' behaviour was influenced positively by innovative multimodal ODeL supervision practices through online classrooms and workshop support. The innovative multimodal ODeL supervision practice offers some multimedia options such as text documents, PowerPoint presentations, and video and audio recordings that are uploaded in the online classrooms. The next section presents the effect that multimedia within the innovative multimodal ODeL supervision practice had on the master's and doctoral candidates.

Multimedia effects

As argued by Yilmaz et al. (2019), visual forms such as photographs, videos, posters and templates provide individual meanings to the observers leading to visual and social learning. This was evident in the data as well, as visual resources were valued for their affordance of synchronicity and asynchronicity. Participants indicated that they valued the ability to watch the videos in their own time and at their own pace: 'Support from the videos and presentation from Google Classroom, help us to make references and recall from previous meeting and always serve as our guidelines' (Participant 1). Participant 3 reiterated that the recordings were helpful and added that 'I'm able to watch them at my own pace'. Participant 7 highlighted the importance of having the multimedia support material uploaded in the online classroom: 'especially that they were uploaded into the platform. So even if one had missed the lesson, they would be sure to find these presentations and recordings'. Participant 9 said 'watch and review all of the materials

prior to starting a chapter' while Participant 4 appreciated the PowerPoint presentations by saying 'Having presentations about each stage of writing chapters are most helpful'.
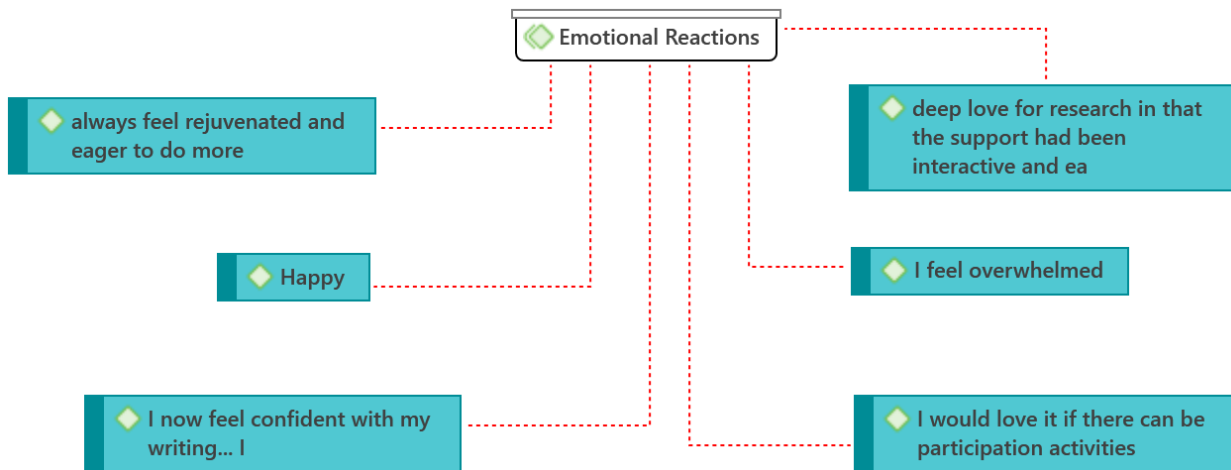
Figure 6. Summary of multimedia effects.

Even though the participants' views, as summarised in Figure 6, present only positive effects, it is essential to note that the effectiveness of multimedia in the supervision of master's and doctoral candidates, especially in the ODeL environment, can also depend on various factors such as the quality of the content, technological infrastructure and individual learning preferences. This paper cautions that multimedia should be used with other established methods of academic supervision to complement and enhance the overall learning experience.

Emotional reactions

SLT affects students' attitudes (Bijandi and Nabavi, 2011). The data revealed mostly favourable attitudes towards social learning. The prominent attitudes were expressed as emotions such as happiness, rejuvenation and confidence although one participant mentioned feelings of being overwhelmed: 'I am happy to join this group as I have support, not only from my supervisor but, from a combination of supervisors' (Participant 1). 'I now feel confident with my writing' (Participant 3). 'I normally feel that this is too much due to my daily workload' (Participant 2). 'The support has allowed me to get the confidence to start a chapter' (Participant 10).

Figure 7. Summary of emotional reactions.

The emotions presented in Figure 7 shows how some of the ODeL M&D candidates can be overwhelmed by being full-time workers and students at the same time.
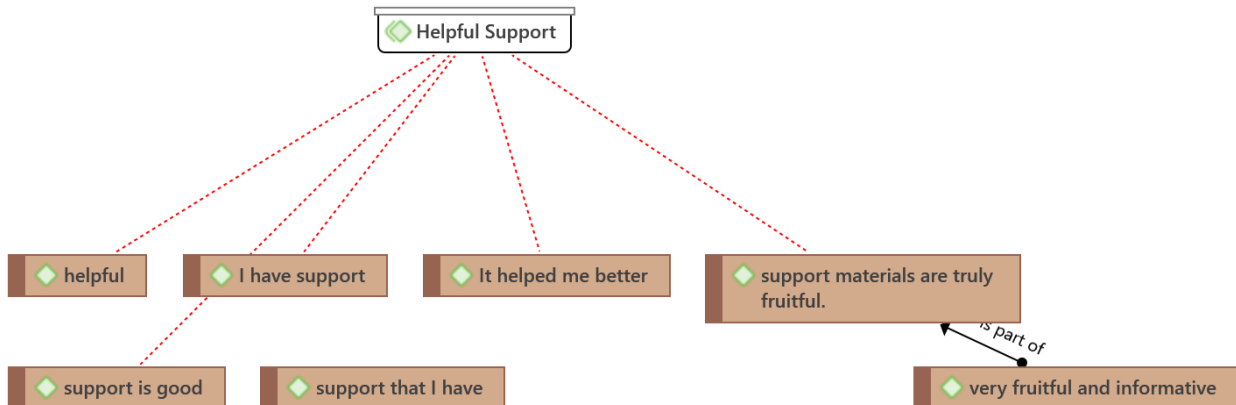
Helpful support

The support offered by the innovative multimodal ODeL supervision practices thus offers a variety of resources and support which is suited to the diverse student profile that it serves. The pedagogical affordances offered meet the needs of various learning styles supported by one-to-one interactions and collaborative support (see Table 2). The data indicated appreciation of the kind of support offered in general:

> *'The support was very helpful to my study' (Participant 6).*
> *'The support that I have received is more than what I was anticipating' (Participant 2).*
> *'support provided allows for a better understanding of the content and structure of each chapter' (Participant 9).*

The nine participants shared positive views about the support they received from the innovative multimodal ODeL supervision practices except one participant who was overwhelmed by their daily workload.

Figure 8. Summary of the helpful support.

Discussion of findings

As mentioned in the theoretical framework section, this study was unpinned by CoP and SLT. To discuss the findings, the researchers selected some of the concepts from these two theories that framed this study. The concepts from CoP that were used are shared practice, collaboration and interaction, while the concepts from SLT are observational learning and modelling.

Shared practice

The CoP revolves around a shared practice that members engage in. M&D candidates participating in this study, share their research practices on Google and Teams Classrooms as explained in the multimodal Open Distance e-Learning supervision model section above. The webinar recordings are shared both in Google and Teams Classrooms for M&D Candidates who could not attend. According to Gherardi (2009), the primary focus of shared practice is the role of students to take responsibility and control for monitoring and managing learning in a CoP. Hennein et al. (2022) regard CoP as a tool to improve the quality of care through knowledge sharing. However, they caution that there is not enough evidence on specific CoP components that are capable of facilitating behaviour change. When looking at the emotional reactions shared in Figure 7, they caution against using a 'one size fits all' approach, which tends to be the approach of traditional supervisors. Linking the CoP with SLT, the innovative multimodal ODeL

supervision practices have the potential to scaffold supervision and foster a more social environment for M&D candidates.

Collaboration and interaction

The findings discussed in the previous sections demonstrate that innovative multimodal ODeL supervision practices have transformed the landscape of postgraduate research. The interaction and collaboration between candidates and supervisors have had a notable impact on the learning behaviour of candidates, resulting in enhanced knowledge transfer and research outcomes. This assertion is supported by the graduation of six candidates from 2021 to 2023: two master's candidates graduated with distinctions, and four doctoral candidates successfully defended their theses with minor corrections. While embracing technology has proven beneficial, it is crucial to remain mindful of addressing technological barriers and ensuring an inclusive learning environment for all candidates. Some candidates, particularly those from underprivileged regions, may face challenges in accessing reliable internet connections and advanced technology. Hence, one may conclude that one of the reasons one candidate felt overwhelmed might be the technological skills needed to navigate the online platforms.

Observational learning

Fryling et al. (2011) regard observational learning as a fundamental concept in SLT. Xu (2021) adds that it suggests that individuals can learn by observing others' actions, behaviours and the consequences of those behaviours. In this study, participants were engaged in what are called research incubators, where each presents their study and supervisors critically share constructive feedback in the presence of other candidates.

The application of observational learning from SLT in the context of innovative multimodal ODeL supervision practices has proven highly beneficial for M&D candidates, especially in that candidates were receiving real-time feedback during the online workshops, which Manik et al. (2022) view as giving the candidates valuable insights. This paper posits that when M&D candidates observe positive role models, peers and expert researchers, this leads to the development of research skills, academic confidence and a sense of

community. By understanding and harnessing the power of observational learning, institutions and supervisors can create an enriched and supportive learning environment that nurtures the academic growth and success of candidates in the ODeL environment.

Modelling

Modelling in the context of SLT refers to the process of imitating or emulating the behaviour of others (Koutroubas and Galanakis, 2022). SLT emphasises the importance of modelling as a powerful learning mechanism. In the context of innovative multimodal ODeL supervision practices, M&D candidates observe and model effective research practices demonstrated by their supervisors. Through the online workshops, candidates witness how supervisors approach research problems, conduct literature reviews, analyse data and structure their arguments. By emulating these behaviours, candidates acquire valuable research skills and improve the quality of their own research work. Being in the Google and Teams classrooms allows candidates to collaborate with peers and engage in peer modelling, thereby benefiting from observing different working styles, problem-solving approaches and research strategies. This exposure to diverse modelling enriches their own skill set and expands their perspectives on research methodologies.

Recommendations

Innovative multimodal ODeL supervision practices through the lens of CoP and SLT as a means of supervising master's and doctoral candidates bear fruit if they are well-planned, well-resourced and interactive. The data gathered in this study showed an appreciation for multimedia support, with the asynchronicity affordance a valued feature. The importance of modelling should be noted as a way in which students acquire relevant skills from both their peers and instructors. The following is recommended to the ODeL institutions and supervisors planning to use innovative multimodal ODeL supervision practices to support M&D candidates:

- Incorporate video conferencing, instant messaging, email and collaborative platforms to ensure real-time communication and timely feedback.

- Create virtual academic communities through online forums, discussion boards and social media groups where candidates and supervisors can interact, exchange ideas and collaborate with peers.

- Combine synchronous and asynchronous learning experiences to accommodate candidates' varied schedules and preferences.

- Equip supervisors with the necessary training and resources to effectively conduct ODeL supervision.

- Promote peer mentoring and collaboration among candidates, enabling them to learn from each other's experiences, offer feedback and engage in collaborative research projects.

- Address technological barriers and ensure that all candidates have access to the necessary technological resources and support for effective participation in ODeL programmes.

- Implement accessible design principles to accommodate candidates with disabilities.

- Integrate discussions and training on research ethics and academic integrity into the supervision process.

- Host virtual research seminars and conferences where candidates can present their work to a broader audience, receive constructive feedback and network with experts in their field.

- Regularly seek feedback from both candidates and supervisors on the effectiveness of the innovative supervision practices. Use this feedback to make continuous improvements and adapt the multimodal approach to better meet the evolving needs of candidates.

Conclusion

This study provides valuable insights into the transformative potential of technology-driven approaches in higher education. Through the lens of the concepts from the theoretical framework underpinning this study – collaboration and interaction, observational learning and modelling – this research highlights the positive impact of innovative practices on candidates' academic development and overall research experience. The findings reveal

that virtual communication tools have significantly enhanced collaboration between candidates and supervisors, breaking down geographical barriers and facilitating real-time feedback and guidance. In particular, the multimodal support offered, the resources used, and the synchronous and asynchronous multimedia resources gave M&D candidates flexibility in their engagements. In addition, the students indicated their positive attitudes and emotions towards the supervision practices. Multimodal learning spaces, including online workshops and virtual classrooms, have promoted engagement, peer learning and the development of a supportive academic community. Observational learning and modelling from supervisors and peers have emerged as influential factors in shaping candidates' research practices, professionalism, time management and emotional intelligence.

Candidates who witness positive role models and engage in peer collaboration are more likely to emulate these behaviours, leading to improved research outcomes and academic integrity. Furthermore, the study acknowledges the importance of addressing technological barriers to ensure inclusivity and accessibility for all candidates. By providing specialised training for supervisors and fostering a culture of continuous feedback and improvement, institutions can optimise their supervision practices to better meet the diverse needs of candidates. By embracing technology and leveraging CoP and SLT principles, institutions can create a rich and supportive learning ecosystem that empowers M&D candidates to excel in their research endeavours, contribute to their respective fields, and emerge as skilled and knowledgeable scholars in the global academic landscape.

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