

**Elements of blended continuous professional development short course
design for educators**

by

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in Computer Integrated Education**

in the Faculty of Education

at the

UNIVERSITY OF PRETORIA

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Co-supervisor: Prof. Ronel Callaghan

March 2024

Declaration

I declare that the dissertation, titled: **Elements of blended continuous professional development short course design for educators**, which I hereby submit for the degree Magister Educationis, Computer Integrated Education, at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this, or any other, tertiary institution.



.....
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March 2024

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Dedication

I dedicate this research to our South African people, and anyone in the world who strives to grow, improve, and become all they can be. May this research, and more importantly, its application led to the emancipation of people who yearn for the opportunity to learn, grow, develop and bring change to the parts of our world that remain broken.

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I thank you.

Abstract

Instructional Design (ID) is the science of course design. Learning programmes can be enhanced by Computer Integration through blended learning. ID can be guided by design models such as the ADDIE Model. Pairing traditional design models with modern blended learning can provide a powerful platform for accessible and flexible learning, learner tracking, and individual feedback. This study addresses problems pertaining to continuous professional development (CPD) programme design for educators. Educators need CPD to satisfy the needs of an evolving education landscape. CPD programmes can be delivered through blended short learning programmes. To train teachers efficiently we need to understand not only the design process, but also the design elements and considerations that can make it more efficient and tailored to the needs of the participants. This study addresses the research question: What elements should be included during blended CPD short course design for educators? The researcher applied a qualitative research methodology and a design-based research approach. This research shows the elements of, and considerations for, three research contexts, namely, educators, CPD and short courses, as well as two research focus areas, namely, course design and blended learning. The researcher presents 39 considerations and 48 elements that can be implemented on top of ID models such as the ADDIE Model. These elements were unearthed by combining data gathered through a systematic literature review, expert interviews, and educators as participants in a newly designed course. This research can assist designers to design short, blended, CPD learning programmes for educators.

Key terms

ADDIE; Blended learning; Continuous Professional Development; Educator; Instructional design; Learning Management System; Mobile learning; Online learning; Short course.

Language editor

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List of abbreviations

ADDIE	Instructional Design Model (Analysis, Design, Develop, Implementation, Evaluation)
CPD	Continuous Professional Development
DBR	Design-based research
F2F	Face-to-Face (instruction)
LMS	Learning Management System
SME	Subject Matter Expert
SLR	Systematic Literature Review

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Chapter 1: General Orientation

This study aims to inductively determine the *Elements of blended continuous professional development short course design for educators*. In this chapter, the researcher lays out the general orientation to the study.

1.1 Introduction

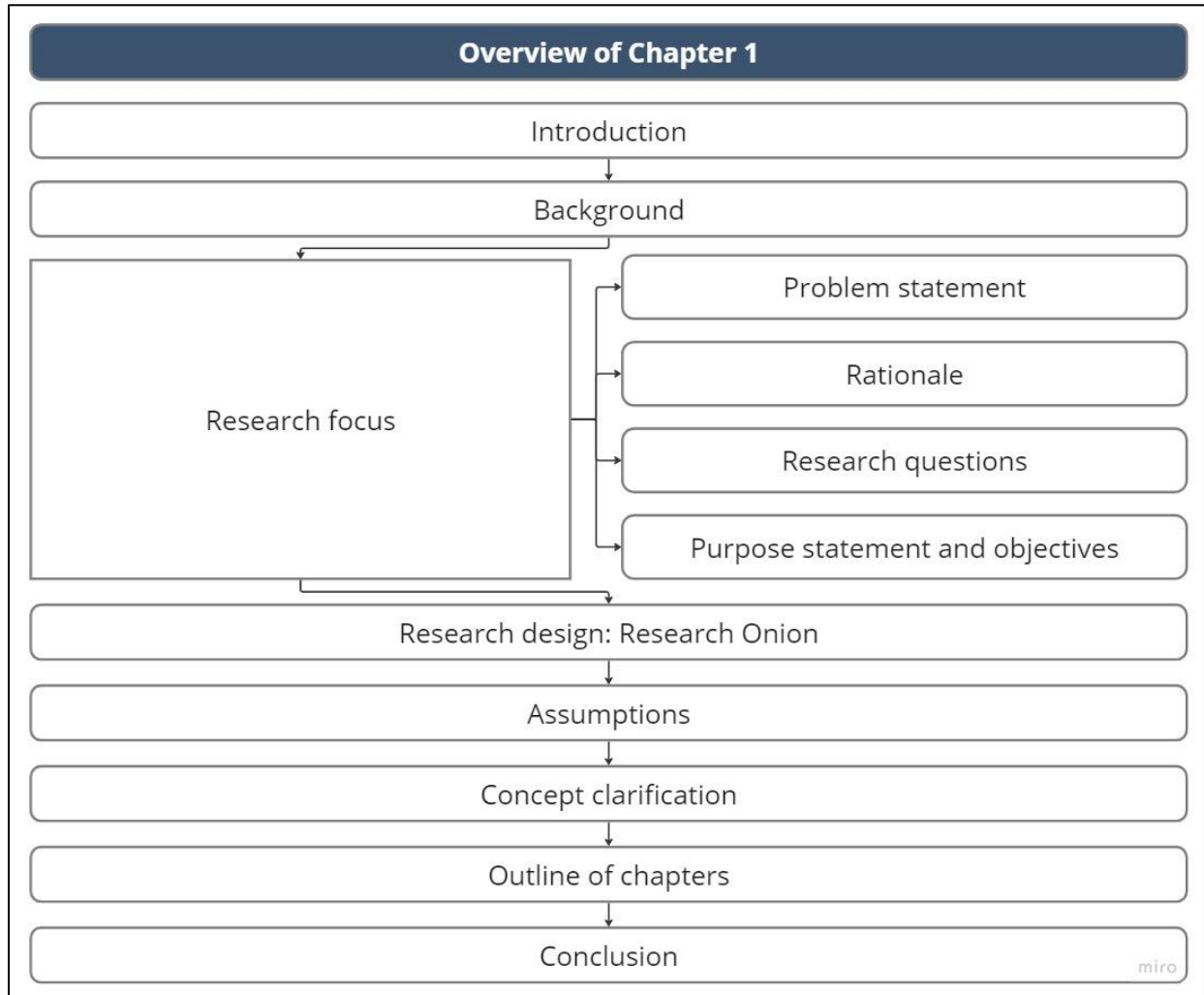
Computer use and the adoption of related technologies have increased rapidly over the past 60 years (Singh & Thurman, 2019). The rise of technology, through the world wide web (Ratheeswari, 2018), has allowed humanity to pool and share its knowledge across traditional limits of time and geography (Laisheng & Zhengxia, 2011; Malik, 2018). Consequently, educational technology plays a critical developmental role in any country (Malik, 2018). While teachers form the backbone of the educational system (Ratheeswari, 2018), technology integration plays an increasingly important role in learning and development (Hashim, 2018; Malik, 2018; Ratheeswari, 2018; Singh & Thurman, 2019). South African basic education is ranked amongst the poorest performing education systems in the world (Maddock & Maroun, 2018). Attracting and training high quality teachers, who apply educational technology, should be a focus area for a developing country like South Africa (Malik, 2018). Educators, as adult learners, participate in continuous professional development (CPD) to keep abreast of changes in educational technology and make lessons engaging for a changing learning population and society (Ratheeswari, 2018). Teachers need access to CPD programmes which suit their busy time-schedules in a demanding profession (Sayed, 2018). Instructional designers can draw on a combination of traditional teaching and learning strategies, e.g., Instructional Design (ID) models and technology integration to overcome time constraints and facilitate educator CPD (Sayed, 2018). The ADDIE Model of ID is a popular ID model, which guides analysis, design, development, implementation, and evaluation of a learning programme (Jonnalagadda et al., 2022; Spatioti et al., 2022). Blended learning enables a combination of face-to-face (F2F) instruction and technology integration, especially online learning, to enhance learning experiences and optimise the learning process (Blessinger & Wankel, 2013; Castro & Tumibay, 2021; Dziuban et al., 2018).

This study aims to induce elements and considerations of blended CPD short course design for educators. The purpose of the study is to enhance technology-integrated teaching and learning for course designers. In this study, elements are regarded as the most important aspects of course design. Considerations do not necessarily form the core of design but are important to keep in mind while designing. The researcher consulted literature, as well as two real-world blended short

courses, with the results of each cycle cumulatively contributing to address the main research question.

Figure 1.1 illustrates an overview of the sections addressed in Chapter 1.

Figure 1.1
Chapter 1 overview



Source: The researcher

In Chapter 1, the researcher provides the reader with a general orientation to the study. The researcher includes the background to the study, as well as research focus and design. The outline of chapters is presented in section 1.5, followed by the chapter conclusion in section 1.6. In section 1.2, the researcher presents a background to the study.

1.2 Background to the study

In response to the rapid changes in the world of work and educational technology, a higher education institution in South Africa presented a course to 500 subject and curriculum advisors from the Limpopo Province's Department of Basic Education. The course was intended to empower the advisors to assist educators in enhancing and supporting technology integration in their classrooms. The researcher participated as a facilitator in this course, for a group of 50 course participants. Involvement in this course as a facilitator sparked an interest in cultivating a better understanding of the core elements that form the backbone of blended course design. A combination of F2F instruction and technology integration created the possibility for the development and implementation of a learning programme that could overcome traditional limitations of time and geography, while empowering participants to take ownership of their own development through online course participation.

The researcher drew on three data sets to induce an understanding of the design elements and considerations when designing and presenting a blended learning programme for educators. The researcher performed three research cycles, including a systematic literature review (SLR) (Cycle 1); a focus group discussion with experienced course designers (Cycle 2); and a new blended learning programme, designed and implemented by the researcher to address the needs of educators at a South African school (Cycle 3). The research approach and design are discussed in Chapter 2.

1.3 Research focus

In this section, the researcher addresses the focus of the research. The researcher states the research problem, the rationale for the research, the research questions, the purpose statement, and the research objectives. The study addresses elements of blended CPD short course design for educators.

1.3.1 Problem statement

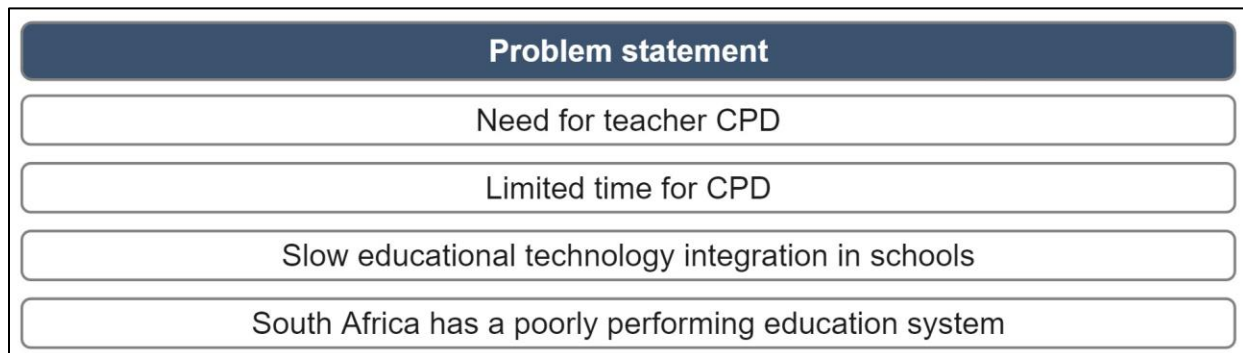
This study aims to address the need for improving course design, to enable better teacher training and development (*Google Workspace for Education: Education Fundamentals package*, 2021; Maddock & Maroun, 2018; Mlachila & Moeletsi, 2019; van der Berg, 2008) through technology integration. South African teachers are under severe pressure to perform and improve educational outcomes in South Africa (Mlachila & Moeletsi, 2019), but lack infrastructure (Mlachila & Moeletsi, 2019), training and time (Sayed, 2018) for technology integration. The South African education system is one of the worst performing education systems in the world (Maddock & Maroun, 2018;

Mlachila & Moeletsi, 2019; Zepeda, 2019) and faces a skills and employment crisis that requires urgent intervention (Mlambo, 2018).

Teachers play an instrumental role in the success of an education system (Ratheeswari, 2018; Sayed, 2018; Wahjusaputri et al., 2022; Yusuf et al., 2020) and are central to student learning (Zepeda, 2019). Research on CPD programs for teachers is needed, especially in technology integration (Yusuf et al., 2020), which has seen slow adoption due to a lack of infrastructure (Maddock & Maroun, 2018). Teachers need continuous training and development (Drossel et al., 2017; Malik, 2018; Raza et al., 2020; Ross, 2022; Ross et al., 2017) to improve their subject knowledge (Mlachila & Moeletsi, 2019), drive technology integration (Arghode et al., 2018; Hashim, 2018; Schindler et al., 2017), improve management and hold teachers accountable (Mlachila & Moeletsi, 2019). Providing contextually relevant professional development improves teacher retention and subsequently improves learner performance (Zepeda, 2019). Technology integration in CPD programmes is a critical step toward teacher training and development (Arghode et al., 2018; Mlachila & Moeletsi, 2019), especially in rural communities (Maddock & Maroun, 2018; Mlachila & Moeletsi, 2019; van der Berg, 2008).

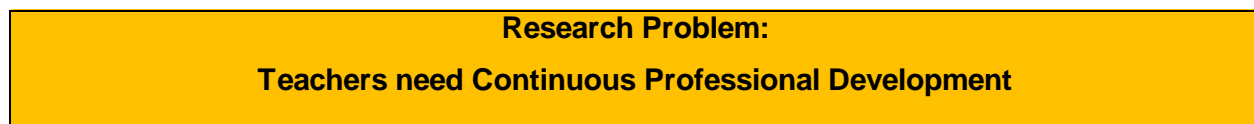
Figure 1.2 illustrates the problems this study aims to address.

Figure 1.2
Problem statement.



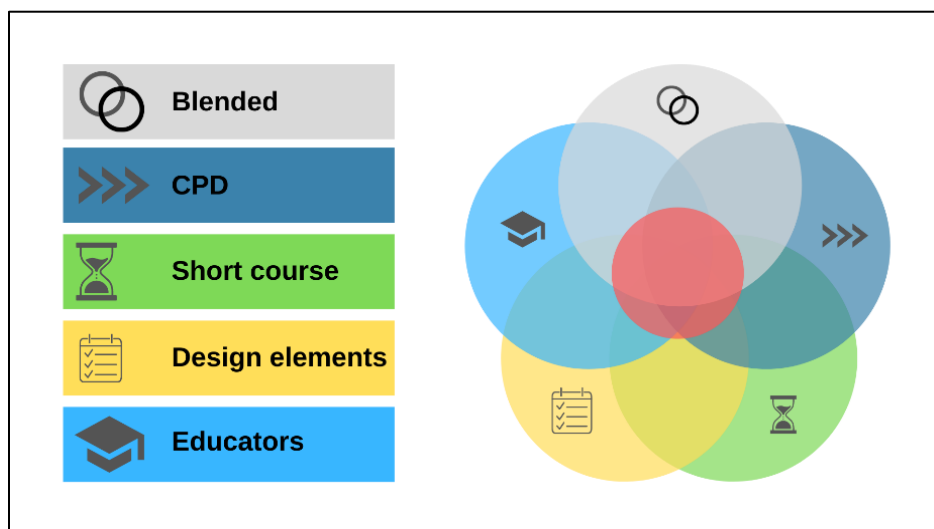
Source: The researcher

Figure 1.2 illustrates four problems addressed by this study. Teachers need CPD opportunities but have limited time available for CPD participation. Technology integration is slow in South African schools, which might contribute to the poor performance of the South African education system. The researcher presents the main research problem.



The main research problem is aligned to the focus of the study through five aspects addressed by the study. The five aspects addressed are: blended learning; CPD; short course; design elements, and educators. The intersectionality of these five elements is illustrated by the Venn diagram in Figure 1.3. Additionally, there is a need for research on the use of computer-integrated CPD courses, and the modalities used to present these courses. This study therefore addresses the need for CPD, as well possible approaches to addressing that need.

Figure 1.3
Venn diagram of context and research focus areas.



Source: The researcher

In Figure 1.3, the Venn diagram of context and research focus areas illustrates the study context and two research focus areas addressed by the study. The context addressed in the study is threefold, namely educators, short course, and CPD. The research focus areas addressed by the study include design elements and blended learning. The researcher aimed to unearth the elements and considerations of each context and research focus area, illustrated by the five circles, as well as how each aspect intersects to address the main research question, illustrated by the central red circle.

1.3.2 Rationale

The researcher aims to establish how a combination of F2F training and technology integration, known as blended learning, can drive CPD among teachers over a short period of time. Understanding design elements, such as the ADDIE Model of ID, and blended learning, could assist course designers to empower teachers, and more importantly, teachers to empower themselves. Student achievement is improved when teachers' capacity to improve instructional

practice is improved (Zepeda, 2019). Well-designed CPD programmes that leverage technology integration can make CPD accessible, flexible, and engaging on a broad scale (Jalinus et al., 2021). By empowering teachers in the fields of subject knowledge, school management and technology integration, teachers might be more equipped to address the shortfalls of a poorly performing South African education system (Maddock & Maroun, 2018; van der Berg, 2008).

1.3.3 Research questions

The research strategy implemented in the study followed three research cycles addressed in sub-research questions one through three. The findings and results from each of the three sub-research questions are combined to address the main research question. The main research question, as well as the three sub-research questions, are presented in this section.

Main research question:

What elements should be included during blended CPD short course design for educators?

The main research question focuses on five main ideas, namely, the elements of blended learning, CPD, short course, design, and educators. ‘Elements’ refers to the key characteristics or components of design. Elements form the core of the design and are instrumental to the design process. ‘Blended’ refers to modality, method, and instructional approach. ‘CPD’ refers to the purpose of learning. ‘Short course’ refers to the course duration. ‘Design’ refers to instructional design, while ‘educators’ refers to the target audience for this study. The researcher induces design elements by combining the elements and considerations emanating from sub-research questions one, two and three.

First sub-research question (Cycle 1):

What are the design elements of a blended CPD short course for educators according to the findings of a Systematic Literature Review?

The first sub-research question is addressed through an SLR, which forms the first of three cycles of the research cycle. In Cycle 1, Chapter 3, the researcher induces the first set of design elements. The researcher reviews published literature, through an SLR, to induce elements of blended CPD course design for educators.

Second sub-research question (Cycle 2):

What are the design elements of an existing blended CPD short course for educators?

The second sub-research question is addressed by data, stemming from the second cycle of the research cycle, the design elements of an existing blended CPD short course. This research question aimed to induce elements of blended CPD course design for educators from the reported experience of expert designers, who recently designed and implemented a course. Cycle 2, Chapter 4, presents an updated and enriched set of design elements, based on the experience and expertise of experienced course designers.

Third sub-research question (Cycle 3):

What are the design elements of a newly developed blended CPD short course for educators, based on educators' experience of course design?

The third sub-research question will be addressed by data, stemming from the third cycle of the research cycle, the design elements of a newly developed, blended CPD short course. This research question aimed to induce elements of blended CPD course design for educators by actively designing and implementing a course, after which data is gathered from course participants. The results from the third cycle are presented in Chapter 5.

1.3.4 Purpose statement and objectives

The purpose of this study is to identify design elements of blended CPD short courses for educators. The study aims to induce design elements which could be used for the design of blended CPD short courses for educators.

The researcher aims to achieve one main objective through his research. The objective of the study is to:

- Induce the design elements of a blended CPD short course.

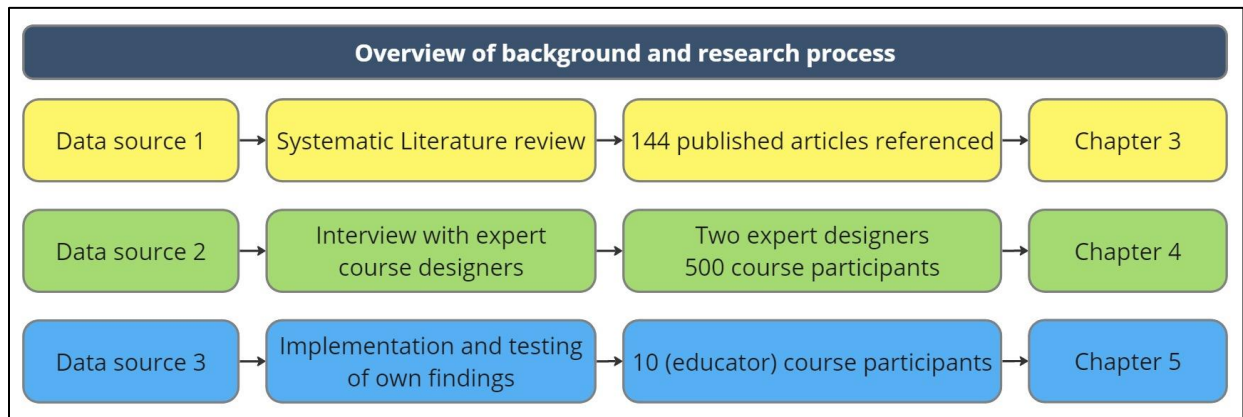
This is achieved through three sub-objectives. The three sub-objectives of the study are:

- Induce the design elements of a blended CPD short course, based on an SLR.
- Induce the design elements of a blended CPD short course, based on an existing blended short course.
- Induce the design elements of a blended CPD short course, based on educators' experiences of a newly developed course.

1.4 Research design

The researcher embarked on a journey of establishing the elements and considerations of blended short course design for educators. Data were collected by means of three research cycles, namely an SLR (Cycle 1), a focus group discussion with two course design experts (Cycle 2) and the eventual design and implementation of a blended CPD short course of my own (Cycle 3). The findings and results published in this study were cumulatively drawn and induced from a combination of 600 published articles; the lived experience of 2 expert designers, who designed and implemented a course for 500 teacher-participants; and the experience of 10 educators, who participated in a newly designed course. The researcher induced the elements and considerations of each of the three research cycles. The findings and results from each cycle are presented at the end of each chapter, while the compiled findings and results from each of the three cycles are presented in Chapter 6. Figure 1.4 illustrates the three cycles of the study as well as the chapter which addresses the cycles.

Figure 1.4
Background and research process.



Source: The researcher

Cycle 1, the SLR, is addressed in Chapter 3; Cycle 2, the focus group discussion, in Chapter 4 and Cycle 3, implementation of a newly designed course, in Chapter 5. Through this study, the researcher aims to enable course designers to implement the considerations and elements induced through this study, and to empower educators through engaging with short blended CPD learning programmes.

1.5 Outline of chapters

This dissertation consists of six chapters. In Chapter 1, the researcher outlines the background, problem statement, rationale, research questions and research objectives for the study. Chapter 2 addresses the research methodology, alignment, and ethical considerations. Chapters 3, 4 and 5 address the three research cycles, Cycle 1 (SLR), Cycle 2 (focus group discussion) and Cycle 3 (newly designed course), respectively.

Chapter 3 presents the outcomes of the scoping review and SLR performed by the researcher to induce the first set of design elements and considerations.

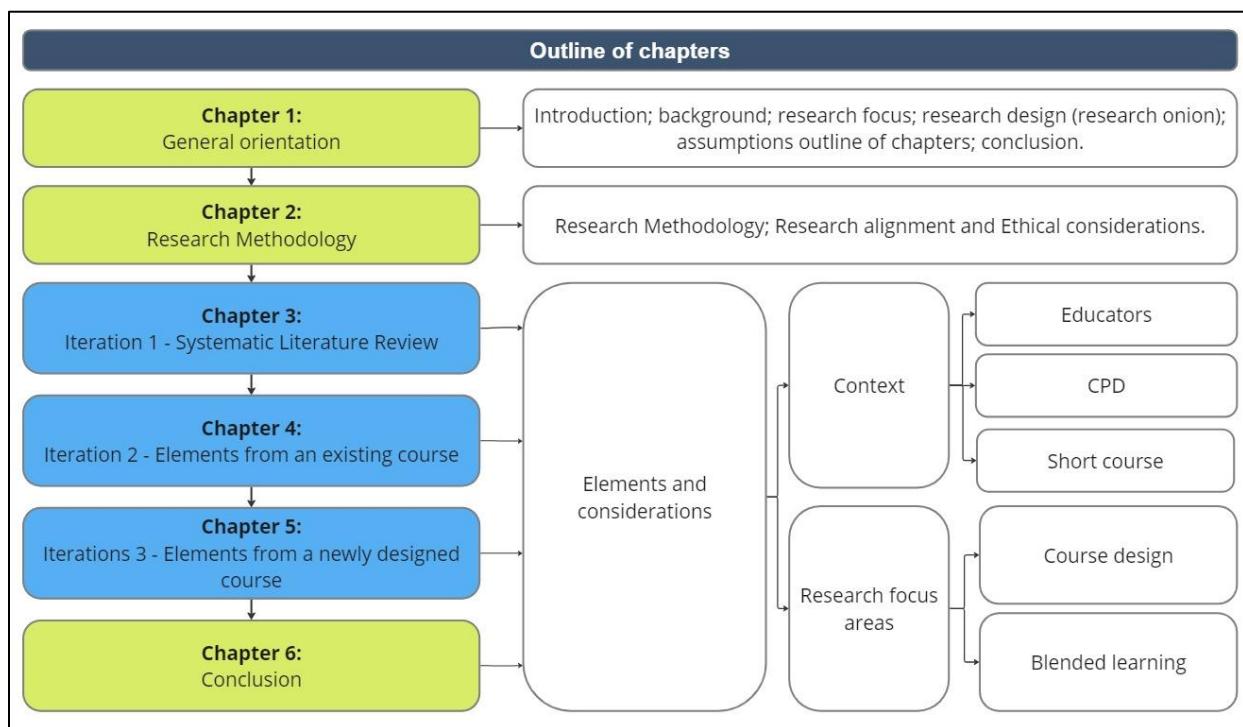
Chapter 4 presents the qualitatively analysed data gathered from two professional course designers from a higher education institute (Cycle 2). The designers shared their experience and expertise on course design, by participating in a focus group discussion about a course they designed and implemented for 500 subject and curriculum advisors in 2021. In Chapter 4, the themes, elements, and considerations which emerged in Chapter 3 are confirmed, while themes, elements and considerations which emerge in Chapter 4 are established.

Chapter 5 describes Cycle 3 of the study. The researcher drew on the elements and considerations emerging from Chapter 3 (Cycle 1) and Chapter 4 (Cycle 2) to design and

implement a new blended CPD learning programme for educator-participants. The researcher gathered qualitative data from the participants through an online questionnaire to induce a refined set of elements, and considerations, based on the experiences of the course participants in Cycle 3.

Each new cycle builds on the elements and considerations of each prior cycle to form the findings and results of the study. These combined findings and results, from Cycles 1, 2 and 3 are presented in Chapter 6. Figure 1.5 illustrates the structure of the study. A brief discussion follows.

Figure 1.5
Outline of Chapters 1 - 6



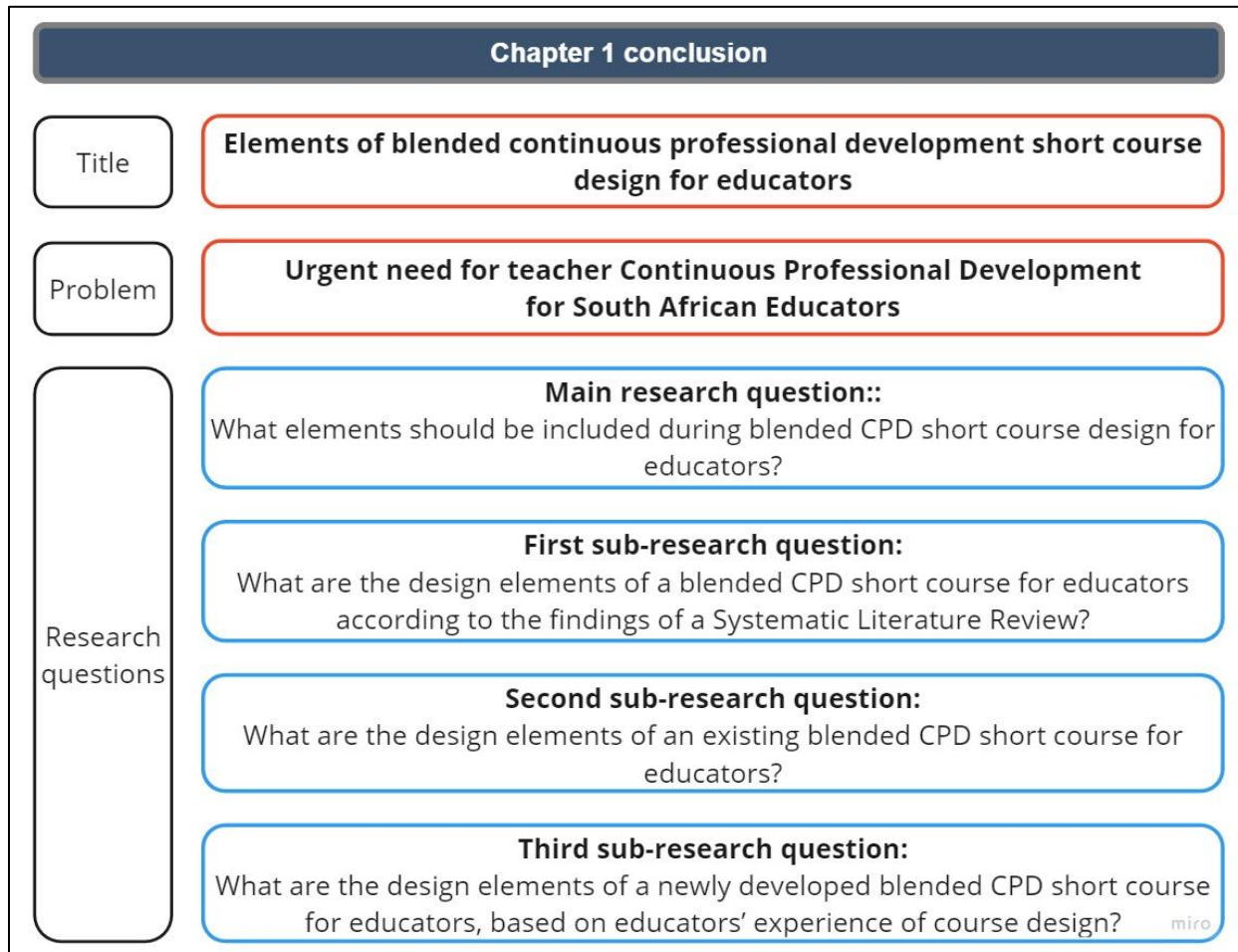
Source: The researcher

Figure 1.7 illustrates the structure of the study from Chapters 1 to 6. Chapter 1 serves as a general orientation to the study; Chapter 2 outlines the research methodology; Chapters 3–5 present research Cycles 1–3. Each research cycle aimed to induce and refine elements and considerations of the research context and research focus areas. The research context included educators, CPD and short course, while the research focus areas include course design and blended learning. Chapter 6 presents the final refined set of elements and considerations as a conclusion to the study.

1.6 Conclusion

In this chapter, the researcher provided the reader with an overview of the study. Figure 1.6 illustrates the title, research problem and research questions addressed by this study.

Figure 1.6
Chapter 1 conclusion



Source: The researcher

The researcher provided a background to the study, and established the problems, questions, and objectives that this study aims to address. Chapter 1 informs the research methodology, literature review, and data collection- and analysis decisions for the remainder of the study.

Chapter 2 focuses on the research methodology, describing the cyclic nature of the research design.

Chapter 2: Research methodology

2.1 Introduction

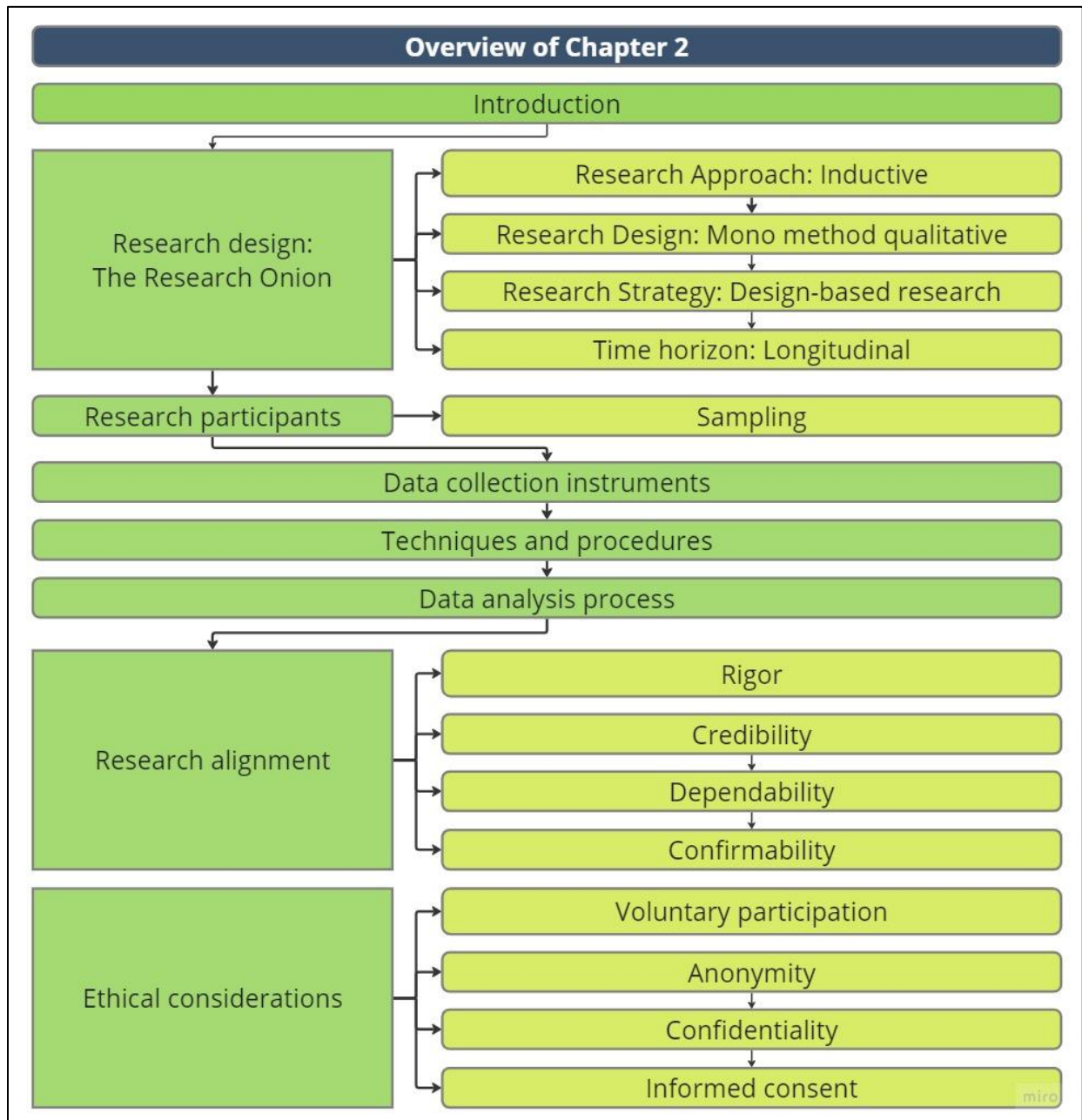
The research methodology is unpacked in terms of the 'Research Onion' (Saunders et al. (2019)). This chapter aims to outline how the research was designed to address the research questions. This chapter shows how the research was designed to address the main research question, discussed in Chapter 1, Section 1.3.2.

Main research question:

What elements should be included during blended CPD short course design for educators?

This chapter serves as a blueprint, guiding the approach and method followed in the execution of the research process and subsequent data gathering and analysis. Figure 2.1 outlines the structure of Chapter 2.

Figure 2.1
Chapter 2 overview



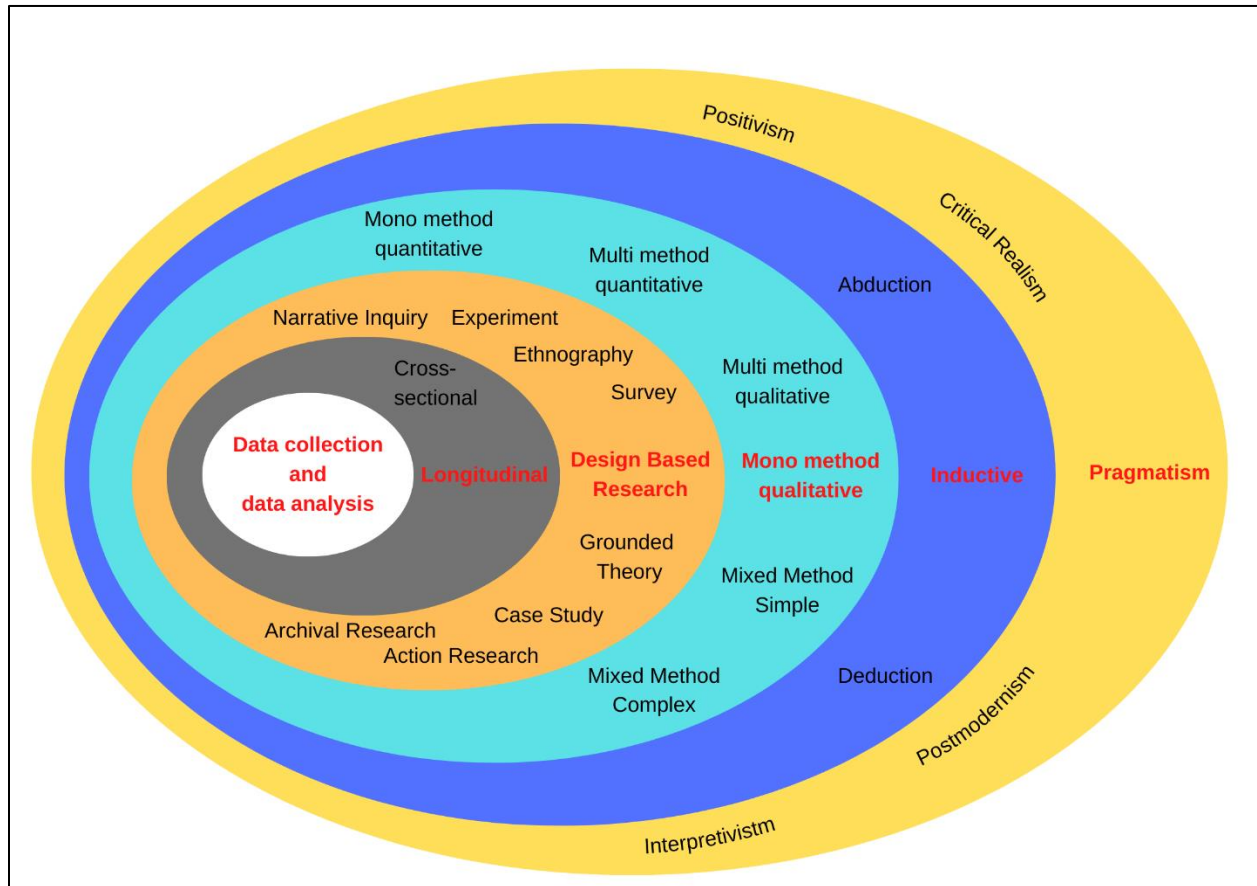
Source: The researcher

Figure 2.1 presents an overview of Chapter 2. Headings are highlighted in dark green, with sub-headings in light green to simplify the layout and flow of Chapter 2. In section 2.2, the researcher addresses the research design.

2.2 Research design

Research design is an essential step in the planning and execution of a research project (Saunders et al., 2009; Saunders et al., 2019). The researcher must carefully plan their approach. The researcher used the ‘research onion’ to guide the research design. Figure 2.2 illustrates the research onion as applied to this study.

Figure 2. 2
Research Onion applied to the study.



Source: Saunders et al. (2019)

Various layers of the research onion are presented in Figure 2.2. The methodology applied in this study, namely a pragmatic, inductive, mono-method qualitative, design-based, longitudinal study, is highlighted in red. A discussion follows.

2.3 Research Philosophy

This research is philosophically rooted in pragmatism. Pragmatism states that truth is rooted in action (Kelemen & Rumens, 2008; Morgan, 2014), problem solving and real-world practice (Coghlan & Brydon-Miller, 2014; Kelemen & Rumens, 2008; O'Leary, 2007; Saunders et al., 2019). In pragmatism, theory should be applied as a tool to create meaning and solve everyday problems (Kelemen & Rumens, 2008; Morgan, 2014). Under this philosophical stance, truth is constructed based on experience and action (Kelemen & Rumens, 2008; O'Leary, 2007) and the observed consequences of those actions (Kelemen & Rumens, 2008; Morgan, 2014; O'Leary, 2007).

A pragmatic philosophy is suitable for this study, as this study is positioned in practice and aims to solve real-world problems. The researcher aimed to induce elements of course design from theory. The findings can be used to identify and solve real-world problems through implementation of elements during course design. Thereafter, the researcher drew on elements from practical implementation of a course, which ultimately saw the researcher presenting a new course by drawing on the induced elements to solve a new problem. The findings of the study were therefore induced from practice and action and intended for implementation in future courses.

Thus, theory was applied to create meaning in the form of a conceptual set of design elements that can be used to solve real-world problems through course design. These research experiences and the actions that they inform assist in the researcher's construction of truth. This truth as it is informed by theory and experience assists the research in further meaning-making through the observed implications of implementing course design elements on a real course.

The position of the researcher, in his interactions with theory and actions and interactions with research participants, is therefore subjective. Subjectivism refers to the experiences, perceptions, and interpretations of the researchers as an individual.

The researcher takes a more clinical (yet still subjective) position to analyse the initial data set. In the interaction with this data, the researcher positioned himself independently, due to not being involved directly in the generation of knowledge. The literature review reports on the findings of researchers in the field of ID to address the research questions. The second and third datasets involved the researcher more directly, being more subjective. Here, the researcher acted as facilitator during the second cycle, and designed a course implemented during the third cycle. The researcher assumes that he influenced the design and execution of both short courses, understanding his subjective position, and being wary of bias.

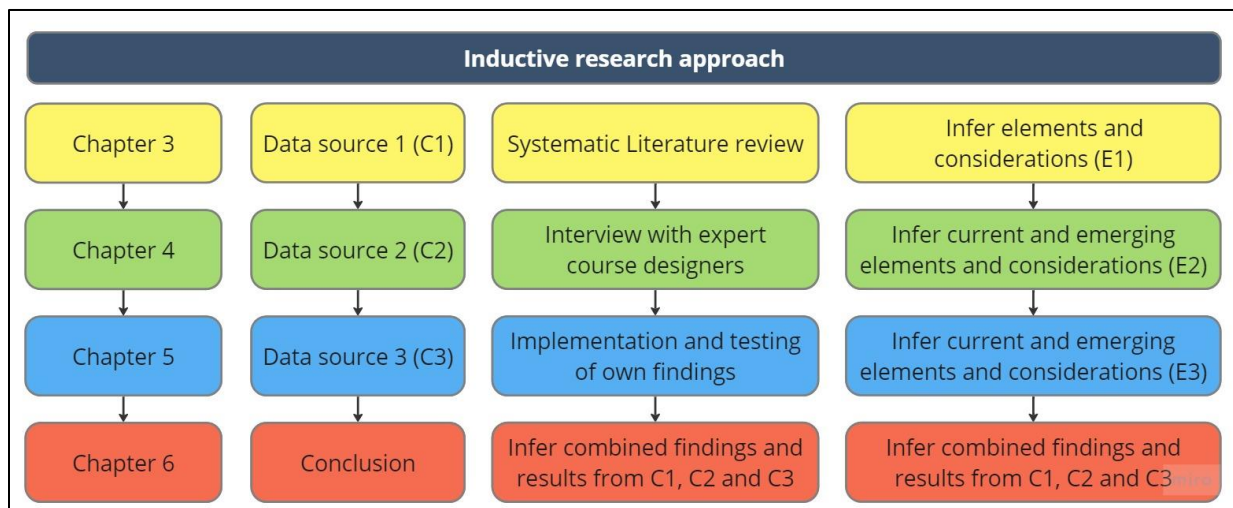
2.4 Approach to theory development: Inductive

The researcher adopted an inductive approach to the study. Inductivism refers to infernal of laws, based on facts and observable evidence (Loseke, 2017; Mills et al., 2010; O'Reilly, 2009). Theory emerges from the collection and analysis of data (Loseke, 2017; Mills et al., 2010). Induction suggests that an observation might be indicative of a possible generalisation (O'Reilly, 2009), which allows the researcher to move from particular examples to general theory (Loseke, 2017; O'Leary, 2007; O'Reilly, 2009).

The researcher induced elements of blended short courses through analysis of three data sets. Through induction, a set of elements and considerations for the context, namely educators, CPD and short course, as well as the research focus areas, namely design elements and blended learning, were established. Each cycle of the research process inductively provided a set of elements and considerations, which were deductively applied in the following cycle of the research process. Current themes (elements and considerations established in the previous cycle, e.g., Cycle 1) are tested for confirmation in the following cycles (e.g., Cycle 2). Emerging themes appear in new cycles (e.g., Cycle 2) and are added to the set of elements and considerations, while the cycle is repeated. The elements and considerations from Cycle 1, Cycle 2 and Cycle 3 are combined to form the conclusion in Chapter 6, representing the elements and considerations of blended CPD short programmes for educators.

Figure 2.3 illustrates the inductive research approach followed by the researcher.

Figure 2.3
Inductive research approach



In all figures, C1, C2 and C3 refer to Cycle 1, Cycle 2, and Cycle 3.

Source: The researcher

Figure 2.3 illustrates how Chapters 3–5 present research cycles 1–3. Each research cycle is used to induce elements and considerations from the data set. Findings and results for each chapter were transferred to subsequent chapters and served as the premise for further analysis and inference. Emerging elements from each chapter are combined to form the results and findings to the study, presented in Chapter 6.

2.5 Methodological choice: Mono-method qualitative

The study was designed as a mono-method qualitative study. Qualitative research explores real-world phenomena (Yin, 2016) from different viewpoints (Guest et al., 2013), through collection and analysis of data (Atkins & Wallace, 2012). Qualitative studies describe lived experiences, as observed from a distance (Daniel, 2012; Flick, 2014, 2018; Yin, 2016).

In Chapter 3, the researcher reviewed published literature and reported on the experiences of research participants. In Chapter 4, the researcher, through a focus group discussion, drew on the experience of professional course designers and facilitators after presentation of a blended short learning programme. Finally, in Chapter 5, the researcher immersed himself in the design experience by creating a blended short learning programme for educators at a public primary school in the Tshwane South District of Pretoria, South Africa. Upon course completion, data was collected qualitatively through an online questionnaire. A focus group discussion in Cycle 3 would have been advantageous, but was not possible, due to severe time constraints faced by the teachers. To enrich the data gathered from Cycle 3, the researcher used short- and long text questions as well as multiple-choice responses to make data collection more convenient for educators. In Cycle 3 (Chapter 5), the researcher used enumeration (Julius et al., 2018), to present qualitative data in the form of numbers and graphs.

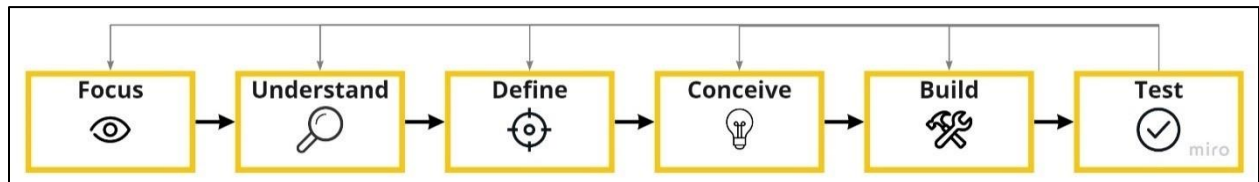
2.6 Research strategy: Design-based research

Design-based research (DBR), is a pragmatic research method aimed at creating links between theory and practice (Vaezi et al., 2019). DBR is supported by research; guided by practical goals; situated in reality; advances theory and the factors affecting the theory in practice; involves feedback from stakeholders, including researchers, professionals, designers, managers, instructors, trainers, learners and experts, and analyses data retrospectively and repeatedly (Collective, 2003; Dolmans & Tigelaar, 2012; Reeves et al., 2017; Russell et al., 2013). In DBR, expert review, evaluation, case study, interviews and retrospective analysis are important factors in ensuring validity and objectivity (Vaezi et al., 2019). An expert review was not conducted in this

study, due to time constraints. However, the researcher recommends involving expert review in future studies.

For this study, the researcher adopted the definition of DBR by Easterday et al. (2014). Easterday, Gerber and Lewis (2014) stated that DBR is an iterative process involving six phases: Focus, Understand, Define, Conceive, Build and Test. Figure 2.4 illustrates the DBR process (Easterday et al. (2014)).

Figure 2. 4
Design-based research



Source: Easterday et al. (2014)

Table 2.1 summarises the six phases of the DBR process, according to Easterday et al. (2014).

Table 2. 1
Six phases of DBR

Phase	Description
Focus	<p><i>Audience, topic, and scope of project:</i></p> <p><i>Audience:</i> Who (all stakeholders) does the product serve, who is designing it, and for what purpose.</p> <p><i>Topic:</i> Specify the general problem to be addressed by the product.</p> <p><i>Scope:</i> Specify constraints and scale of the project.</p> <p>Deliverable: Create design brief</p>
Understand	<p>Designers study the <i>learners, domains, contexts, and existing solutions:</i></p> <p><i>Understand the problem:</i> Empirical research through human centred techniques (observation, interview, survey etc.) and secondary sources (models of learning, cultural contexts, current solutions, and identification of design principles.</p>
Define	<p>Designers set <i>goals and assessments.</i></p> <p>It is likely that current solutions do not work for stakeholders. Turn the indeterminate problem into a specific, novel solution.</p>
Conceive	<p>Designers <i>sketch a plan for the solution.</i></p> <p>Plan design to be used to reach the goal. Conceptualise the solution through a concrete prototype. The prototype is not implemented in a particular medium.</p>
Build	<p>Designers <i>implement</i> the solution.</p> <p>Design is never finished. Every implementation provides an updated prototype which can be used to assess the extent to which the goal was achieved.</p>
Test	<p>Designers <i>evaluate</i> the efficacy of the solution.</p> <p>Testing assesses the design. Testing involves formative evaluation, aimed at removing poor design factors and summative evaluation, aimed at assessing of theoretical and practical goals where achieved.</p> <p>Early testing, during the conceive phase, focus on relevance, while later testing, during the test phase, tests the build phase and focuses on practicality and effectiveness.</p>

The research design comprised three cycles. The researcher applied each of the six DBR phases to Cycles 1, 2 and 3 of the study, as illustrated in Table 2.2. The elements and considerations induced in Cycle 1 and Cycle 2 were tested in Cycle 2 and Cycle 3, respectively. Each cycle represented a dataset. By the end of the third cycle, the researcher had a final set of elements. The researcher used the ADDIE Model of ID as ID model of choice. The DBR process was aligned with the ADDIE process throughout the study, as illustrated in Table 2.2. The ADDIE Model of ID is discussed in Chapter 3.

Table 2.2
DBR process applied to this study.

DBR	Focus	Understand	Define	Conceive	Build	Test
C1	Specify and limit literature sources to recent articles relevant to this study.	Understand the context of each of the articles and the design elements that emerge from the context of the study.	Define the purpose of the SLR: the aim is to establish the first set of design elements (E1).	Conceive a scoping review and systematically discuss how other published literature agree or disagree with the scoping review through an SLR.	Synthesise the first set of elements (E1), based on findings in the SLR.	Apply the first set of elements to a new iteration in C2.
C2	Specify the audience, problem, and constraints in C2.	Understand the context of the participants and design in C2 by gathering information through the data collection process.	The purpose of C2 is to establish the updated set of design elements (E2) by gathering information from two experienced course designers.	Since C2 had already taken place in 2021, make notes on the intended course, as recalled by the instructional designers prior to course commencement.	Course was built and implemented in 2021. Gather data about the course design elements to establish the updated set of elements (E2).	Apply the updated set of elements (E1 and E2) to a new iteration in C3.
C3	Specify the audience, problem, and constraints in C3.	Understand the context of the participants and design in C3 by gathering information about the environment and prospective delegates.	The purpose of C3 is to establish the updated set of design elements (E3) by gathering information from ten educators as course participants.	Sketch a plan for the solution by making use of the theoretical underpinning (ADDIE Model of ID).	Design and implement a new course that addresses the problems and needs identified during the focus and understand phases as well as ADDIE process.	Design elements established and used for write-up of findings and results (Chapter 6). Elements can be applied and tested beyond the scope of this study through new course design.

Note: In all tables, C1, C2 and C3 refer to Cycle 1, Cycle 2 and Cycle 3.

The researcher acknowledges the disadvantages of DBR. The reflexive nature and need for continuous redesign and improvement in DBR makes it very time-consuming (Vaezi et al., 2019). It was a challenge to mitigate time constraints, since inducing elements and considerations could not be rushed until data saturation was achieved. The researcher saved much time by performing a scoping review, guided by Hodell (2021). DBR lacks clear guidelines on when to modify and improve the design (Wang & Hannafin, 2005). The researcher continued exploring elements and considerations until data saturation was achieved between Cycles 1, 2 and 3.

2.7 Time horizon: Longitudinal

The time horizon in this study was longitudinal, because the researcher followed groups over an extended period of time (Mathison, 2005). Longitudinal research involves multiple follow-up measurements on the development, growth and change in achievement, performance, behaviour, or attitude, as well as the influence of interventions and context (Lavrakas, 2008; Mathison, 2005).

This study induced the elements of blended short courses for educators over a period of three years. In Cycle 1, the SLR commenced, with SLR searches limited to literature published between 2018 and 2023. In Cycle 2, the researcher analysed data from a course presented in 2021, while in Cycle 3, the researcher analysed data from a course presented in 2023.

2.8 Research participants

Dataset one consisted of literature in the form of academic publications. The researcher conducted an SLR on the elements and considerations when designing short, blended CPD programmes for educators. Participants in the second dataset were two professional course designers, who designed a course for 500 subject and curriculum advisors in 2021. Participants in the third dataset comprised 10 educators from a public primary school in the Tshwane South District of Gauteng, South Africa.

2.8.1 Sampling

Sampling is defined as the selection of a subset of resources for inclusion in a study (Daniel, 2012; Guest et al., 2013), with the intention of saving money, time and effort (Daniel, 2012). Qualitative sampling should reflect diversity in a group for reliable data collection (Barbour, 2011). The researcher made use of non-probability, convenience sampling (Daniel, 2012) in Cycle 2 and Cycle 3.

For dataset one, the researcher performed an SLR. Literature was sampled using search criteria (Guest et al., 2013) specified in Chapter 3. Literature published in the past five years was given preference, considering the rapid development in technology and computer-integrated learning. The sample size is specified in Chapter 3. The researcher performed coding (Krippendorff, 2019), through two computer aids (Krippendorff, 2019), namely Miro and Microsoft Excel. The researcher reviewed the literature until theoretical saturation was achieved (Guest et al., 2013).

For dataset two, the researcher performed non-probability convenience sampling (Daniel, 2012) through a focus group discussion (Barbour, 2018) with two participants. Both research participants were sampled conveniently (Daniel, 2012), since both participants are lecturers at a

higher education institution close to the researcher, which made them easily accessible. The research participants were selected as experts in the field of course design and were chosen to design and implement a learning programme for 500 subject and curriculum advisors in 2021.

In the third dataset, the researcher made use of non-probability convenience sampling (Daniel, 2012) to overcome the time constraints, both for the researcher and course participants. The target population (Daniel, 2012) in Cycle 3 were educators in a public primary school, located near the researcher's home. Course participants were selected based on accessibility and willingness to participate (Daniel, 2012). The sample size (Daniel, 2012) in Cycle3 was 10 course participants. Data collection was performed through an online survey for convenience. The researcher requested the deputy principal to invite 10 course participants, with diverse views and experiences (Barbour, 2011), who would benefit from participation in a course designed for the purpose of research.

2.8.2 Table of participants Cycle 1–Cycle 3

A table of participants for each research cycle is presented in Table 2.3.

Table 2.3
Table of research participants

DBR	Participant set	Number of participants	Sampling method	Sampling criteria
C1	Published literature	N/A	N/A	Discussed in Chapter 3
C2	Participant 1 (P1) Participant 2 (P2)	Two	Convenient sampling	1. Five Years or more experience in ID. 2. Accessible for research participation: Employed by the University at which I am registered.
C3	Respondent 1 – 10 (R1 – R10)	Ten	Convenient sampling	1. Full-time educator at public school. 2. Accessible for research participation.

Table 2.3 presents the three research cycles. Cycle 1, the SLR, is discussed in detail in Chapter 3. Cycle 2, the focus group discussion, and Cycle 3, the newly designed course, made use of convenience sampling.

2.9 Data collection instruments

Various research instruments were used throughout the research process. In Cycle 1 the researcher made use of computer-based digital analysis programmes (Krippendorff, 2019) to search and organise search results. The researcher used Harzing's 'Publish or Perish' to perform keyword searches and find relevant literature. 'Publish or Perish' is a software tool which helps researchers find relevant articles. 'Publish or Perish' allows researchers to search published academic literature by using certain parameters, including publication date, keywords, title, and author. Search results can be filtered and organised by rank, citation count in other literature, authors, and title. The University's online library was used to access published literature on various databases; lastly, Microsoft Excel was used to code and organise themes (Krippendorff, 2019). In Cycle 2, data collection took place through an online focus group discussion (Barbour, 2011, 2018), using Google Meet. A record of the meeting was taken using 'Open Broadcaster Software', and Microsoft Word's 'Microsoft Speech Services' was used to transcribe the audio file to a text file. The researcher made minor adjustments and corrections manually. The research instrument, focus group discussion, and questions used in Cycle 2 are available in Appendix C2. In Cycle 3, data collection was performed using a Microsoft Form, a qualitative online questionnaire (Olsen, 2012). The instrument used to collect data in Cycle 3 is discussed in Chapter 5.3 and can be viewed in Appendix C3. Microsoft Excel was used to organise and code responses from Cycle 3.

2.10 Techniques and procedures

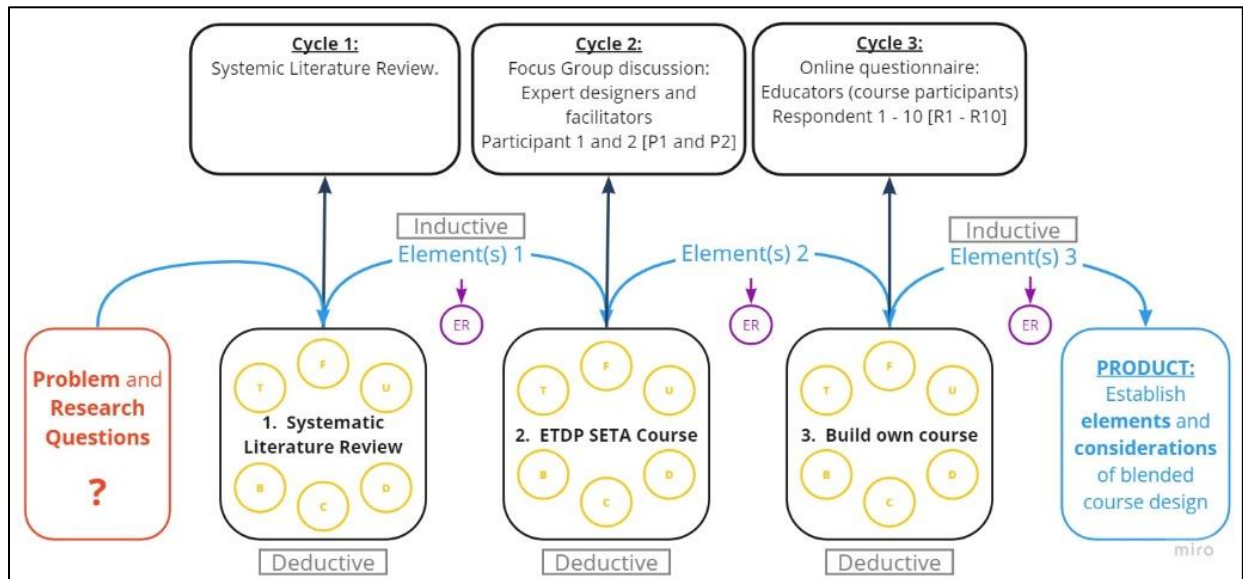
The researcher studied the elements and considerations of blended short course design and made use of three main data sources. The researcher drew on the experience and interpretations of course designers, delegates and/or facilitators in each of these datasets to extract and review elements of blended short course design.

The first data source is an SLR on literature published between 2018 and 2023. The researcher was not actively involved as a designer, facilitator, or delegate in the first data source. The second data source was an eight-week, online short course, presented by The University of Pretoria Enterprises in 2021. This course aimed to provide 500 subject and curriculum advisors with training on the use of technology in the classroom. The researcher acted as a facilitator in this study, while the supervisor and co-supervisor acted as course designers and facilitators. Finally, the researcher implemented elements (1) and elements (2) to design a short, computer-integrated course of his own. The participants in this course were 120 primary school educators who required

training in the integration of ‘Google Workspace for Education’ in their practice as educators. The researcher acted as designer and facilitator in this short course.

Figure 2.5 illustrates the three research cycles used in the study.

Figure 2.5
Research Cycles 1 - 3



Source: The researcher

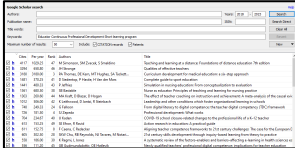
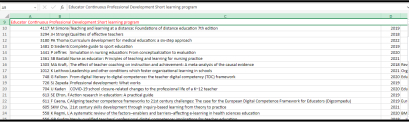
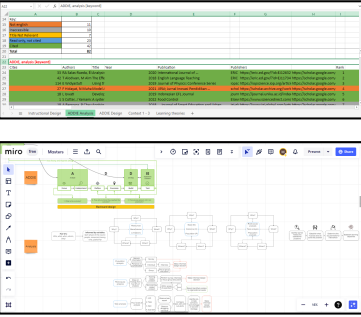
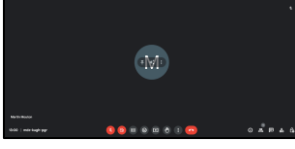

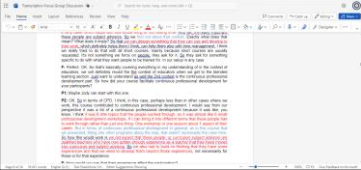

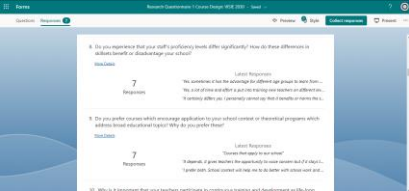
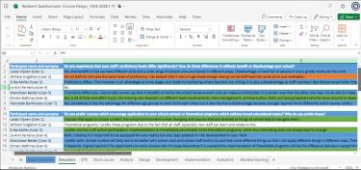
Figure 2.5 illustrates how the research problem was addressed through research cycles 1–3, to deliver the product, or findings and results, or elements and considerations, of blended course design. Each cycle followed a process of deduction and induction to establish the element(s) of course design. The elements were tested in each new cycle, through three iterations, to induce the final set of elements and considerations which address the research problem and research questions.

2.11 Data analysis process

Data analysis takes place through an SLR (Bonk, 2009; Goodwyn & Stables, 2004), followed by content analysis and thematic analysis (Goodwyn & Stables, 2004) through coding (Krippendorff, 2019) of datasets two and three. The researcher made use of a computer database (Krippendorff, 2019), namely Microsoft Excel to facilitate data analysis until saturation was achieved (Guest et al., 2013). Data from datasets one, two and three was coded and organised into themes to assess data saturation.

Data analysis for Chapters 3–5, Cycles 1–3, is presented in Table 2.4.

Table 2. 4
Data analysis process for Cycles 1 - 3

Cycle	Step 1: Collect	Step 2: Export	Step 3: Analyse
C1	Harzings 'Publish or Perish' search result.	Search result exported to Microsoft Excel for coding.	Search results organised and colour-coded to sort which articles were read, excluded, or cited.
			
C2	Google Meet focus group discussion.	Audio file transcribed in Microsoft Word.	Transcription analysed. Red text was quoted directly, while blue text was paraphrased in C2.
			
C3	Google Classroom used as LMS for course delivery.	Responses Microsoft Forms.	Responses sorted and coded in Microsoft Excel.
			

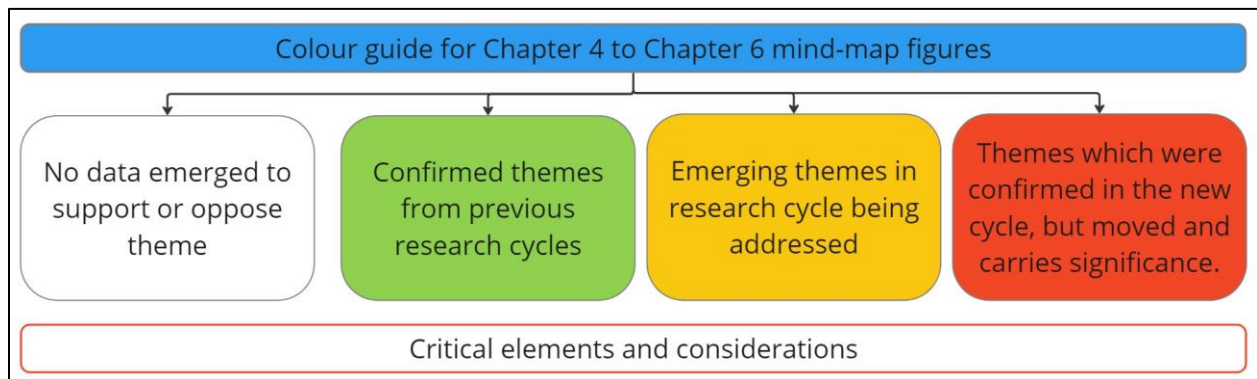
Source: The researcher

Data analysis was conducted for each cycle through three basic steps, namely, collect, export, and analyse. Data collection was performed through 'Publish or Perish' searches (Cycle 1), a Google Meet focus group discussion (Cycle 2) and presentation of a course through the Google Classroom learning management system (LMS) (Cycle 3). Data collected was exported to Microsoft Excel (Cycle 1, Cycle 3), or Microsoft Word (Cycle 2) and Microsoft Form results (Cycle 3). Data analysis then took place using the raw data in Microsoft Excel, Microsoft Word, and Miro (an online mind mapping software (Cycles 1, 2 and 3).

Data analysis was performed with the aid of mind-map figures constructed in Miro. The researcher made use of colour codes in Chapters 4, sections 4.5 and 4.6, as well as in Chapter 5, sections 5.5 and 5.6, to build the findings and results through the research process. The reader should note that not all elements and considerations were confirmed in every research cycle. The first set of elements are presented in Chapter 3, after research Cycle 1. The elements from Cycle 1 are tested for confirmation or opposition in Cycle 2.

Figure 2.6 presents the data analysis process as applied to Miro and presented in the figures in Chapters 3 and 4. A slight adaptation is made in Chapters 5 and 6 to enrich the discussion, as indicated in Chapter 5, section 5.5.

Figure 2.6
Figure colour guide for data analysis in Chapters 3 and 4.



Source: The researcher

Elements and considerations that were not addressed by data in a new research cycle are presented as transparent; themes which emerged in a previous cycle and are confirmed in a new cycle are presented in green; themes which emerge as new themes in a new research cycle are presented in orange, while themes which are confirmed by the new cycle, but have moved to a new position (and carry significance) are highlighted in red. Elements and considerations which are highlighted as critical and substantiated by support in Cycles 1, 2 and 3 are presented as transparent with a red border in Chapter 6.

2.12 Research alignment

2.12.1 Quality assurance

2.12.1.1 Rigour

Rigour refers to thoroughness and precision in the research process to ensure the quality, trustworthiness, and value of research (Allen, 2017; Padgett, 2012). Rigorous research involves the entire research process: from setting clear research questions to the use of appropriate research methods and approaches, attentive sample selection, meticulous data collection and analysis and accurate presentation of findings (Padgett, 2012).

Rigour was applied in this study by following a clear research process and drawing on various data sources through Cycles 1–3. The research problem and questions are presented in Chapter 1; the research methodology is described in Chapter 2; data collection and analyses were conducted through three cycles until data saturation was achieved. Data analysis was performed through the Miro online mind mapping tool and findings presented systematically from existing themes to updated themes for each cycle, as inspired by the data.

2.12.1.2 Credibility

Credibility refers to the extent to which the researcher's account of data provided by participants is accurate, believable, and appropriate (Beck, 2021; Billups, 2022; Mills et al., 2010; Padgett, 2012). Research is considered credible when findings are true for the research participants' experiences (Beck, 2021; Mills et al., 2010). Research is credible if the researcher's bias did not influence the findings. Credibility is established through data saturation, ongoing analysis, and triangulation across multiple data sources (Billups, 2022; Mills et al., 2010; Padgett, 2012).

The researcher ensured that findings are credible and reflective of participants' experiences by referencing published literature to support findings and arguments in Cycle 1. In Cycle 2, the researcher quoted and paraphrased statements as they surfaced in the focus group discussion to support claims and findings. In Cycle 3, the researcher published data from the Microsoft Form and quoted participant responses, where applicable, to support claims. Throughout the study, the researcher used Miro to organise and present findings, by adding emerging elements and considerations to existing themes and considerations from previous cycles. Figures which present the development of induced elements and consider are presented at the relevant points in the dissertation.

2.12.1.3 Transferability

Transferability refers to the extent to which the study can be applied in other contexts and studies (Beck, 2021; Billups, 2022; Coghlan & Brydon-Miller, 2014). Thick description (Billups, 2022) is a term used to describe the context of each cycle of the study and the elements that emerge for each context. In the presented research, findings are generalisable (Padgett, 2012) because the study was informed by data from large groups of participants and from a variety of contexts and sources over an extended period of time. Findings can therefore be transferred to other contexts in the future.

2.12.1.4 Dependability

Dependability requires recognition of the evolving research context (Beck, 2021; Billups, 2022). Findings should be consistent across time and conditions so that a repetition of the study would come to the same conclusion (Billups, 2022). The researcher should keep record of documentation and an audit trail of the data collection and analysis process to showcase the research process (Beck, 2021; Padgett, 2012).

This study is dependable because it was applied in a variety of contexts over a prolonged period, while a detailed record of documentation of the research process is kept for future replications of the study.

2.12.1.5 Confirmability

Research is confirmable when the researcher can show that he is objective and neutral to his own bias (Beck, 2021; Padgett, 2012). Findings should firmly be linked to data (Padgett, 2012). Results must be a true reflection of the participants' perspectives (Billups, 2022). The researcher should be open and upfront about their biases and use research methods that limit their bias (Padgett, 2012). The researcher searches for confirming evidence (Beck, 2021) of elements and considerations through each cycle of the study.

The researcher mitigated researcher bias by following a research design which was informed by the SLR in Cycle 1. The elements and considerations induced in Cycle 1 were used to guide the focus group discussion in Cycle 2 without the participants having any prior knowledge of the elements and considerations established in Cycle 1. In Cycle 3, the researcher drew on the design elements and considerations induced in Cycle 1 and Cycle 2 to guide the design. By following this iterative research design, the researcher followed a predetermined research process, which relied on data to guide the research process in each context.

2.13 Ethical considerations

Ethical research takes place through voluntary research participation, anonymity, confidentiality, and informed consent. The researcher was required to obtain ethical clearance, before research commenced, from the University. The researcher disclosed the intended research methods and participants involved in writing, and approval was granted for commencement.

There were no human participants in Cycle 1, mitigating the need for voluntary participation, anonymity, confidentiality, or informed consent. Cycle 2 involved two staff members at a higher education institution and required ethical clearance to be granted by the Dean of the Faculty, as well as individual consent form for voluntary participation by adults. In Cycle 3, the researcher was required to request written permission for commencement of research at a public school. The researcher was granted permission for research, involving 10 adult participants. Permission was also granted from the school principal in writing before commencement of the research process.

2.13.1 Voluntary participation

Voluntary participation means that participants exercise free will in their decision to partake or withdraw from the research activity (Adams, 2020; Brooks et al., 2014; Israel & Hay, 2011). Participants are not coerced (Israel, 2015; Israel & Hay, 2011); not unduly influenced and have foreknowledge of the risks and benefits of participation (Adams, 2020) as well as how data will be used (Adams, 2020).

Participation in Cycle 2 and Cycle 3 was voluntary. Participants were informed of the risks and benefits of participation and how data would be used. Participants exercised free will to participate and withdraw from the study at any time.

2.13.2 Anonymity

Anonymity refers to the state of being unknown and unidentifiable (Adams, 2020; Israel, 2015). Anonymity is achieved by de-identifying participants and any unique characteristics from publicly available data. The study offers partial anonymity through pseudonyms.

Participation in Cycle 2 and Cycle 3 was anonymous. Participants are not identifiable, using pseudonyms in the form of Participant 1 and 2 in Cycle 2 and Respondents 1–10 in Cycle 3. Personal details were not collected, apart from names and surnames, which were voluntarily supplied. Any personal data, as well as research contributions were stored safely and is not available to the public.

2.13.3 Confidentiality

Confidentiality is associated with privacy, intimacy, trust and the protection of data and the identities of participants (Israel, 2015). Researchers should store, analyse and publish data such that personal information is not revealed (Adams, 2020). Confidentiality ensures higher probability of access to authentic and rich data.

Participation and responses in Cycle 2 and Cycle 3 were confidential. In Cycle 2, data collection took place in the form of a focus group discussion, with both participants voluntarily participating, mitigating the need for confidentiality between participants. In Cycle 3, responses were not shared openly, apart from group activities, or activities which clearly state that other respondents would be able to see responses.

2.13.4 Informed consent

Informed consent promotes autonomy (Anderson & Corneli, 2018) and requires provision of adequate information about the study prior to commencement (Adams, 2020; Anderson & Corneli, 2018). Participants must be informed of the purpose, duration, expectation, risks and discomforts, benefits, extent of confidentiality and an awareness of the freedom associated with voluntary participation in the study (Adams, 2020; Israel, 2015).

Participation in Cycle 2 and Cycle 3 was achieved through informed consent. Adult participants in Cycle 2 and Cycle 3 completed a consent form which stipulated that participation was voluntary, anonymous, and confidential. Cycle 2 was performed at a higher education institution in South Africa. The researcher was required to obtain ethical approval to perform the research from the dean of the faculty prior to commencement of the researcher. Cycle 3 was performed at a public primary school. Written permission to conduct research was obtained from the Department of Basic Education, as well as the school principal. The school principal, as well as individual adult participants in Cycle 2 and Cycle 3, signed individual letters of informed consent prior to commencement of the research. Consent letters informed participants of the duration, expectations, risks, and purpose of participation. A template of the voluntary consent letter is attached in Appendix C. Participants were informed of the duration, expectations, risks, and purpose of participation and were at no point coerced to participate in the research.

Chapter 3: Systematic Literature Review

Chapter 3 presents the results of the first DBR cycle, the SLR, and addresses the first sub-research question. The SLR produced the first set of elements of and considerations for blended CPD short course design for educators to address the first sub-research question.

First sub-research question:

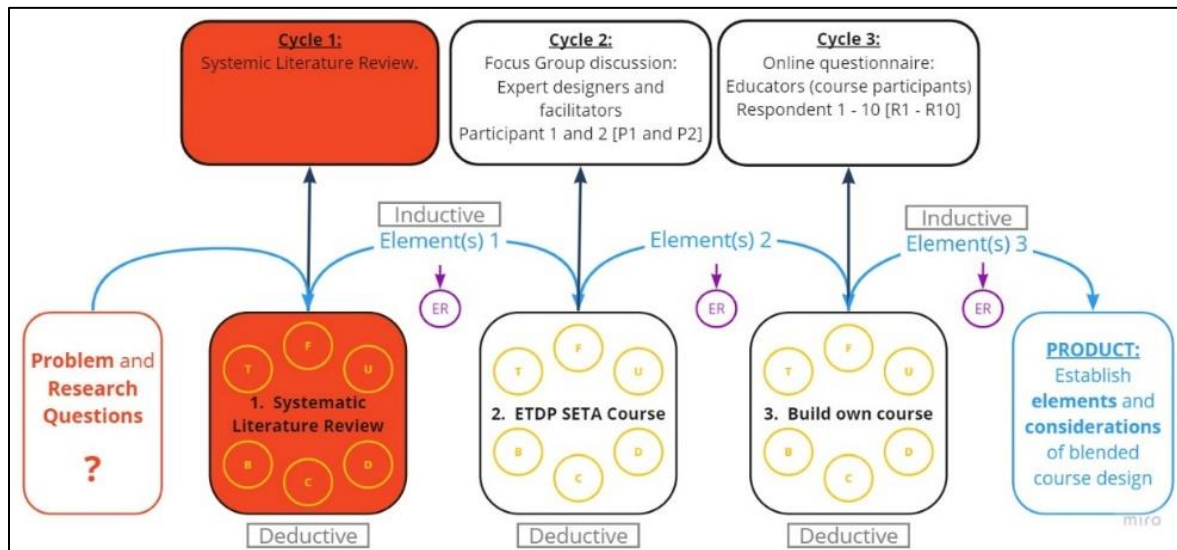
What are the design elements of a blended CPD short course for educators according to the findings of a Systematic Literature Review?

3.1 Introduction

The aim of Chapter 3, the SLR, is to identify, critically appraise, summarise, and synthesise existing evidence concerning a defined problem (Boland et al., 2017; Cennamo & Kalk, 2019; Martin et al., 2017). SLRs are described as the gold standard method for synthesising findings of several studies concerned with the same or similar research questions (Boland et al., 2017). Findings from an SLR enable the researcher to make informed decisions about delivering interventions or changing policy (Boland et al., 2017).

The SLR serves as the first of three cycles in this study. Figure 3.1 illustrates the SLR as Cycle 1 in the study. The Chapter 3 follows the phase of the DBR process as described by Easterday et al. (2014) in Chapter 2 (2.4), namely Focus; Understand; Define; Conceive; Build and Test. The SLR presents the 'conceive and build' phase for Cycle 1. The findings of the SLR (Elements 1), are tested in Cycle 2, Chapter 4. Figure 3.1 illustrates the positioning of Chapter 3, Cycle 1, SLR, in the study.

Figure 3. 1
Research Cycle 1, SLR



Source: The researcher

The researcher commenced Cycle 1, SLR, of the research process. The purpose of Cycle 1 is to induce the first set of design elements and considerations to address the first sub-research problem, as stated in Chapter 1. Cycle 1 of the study is illustrated in Table 3.1.

Table 3. 1
DBR applied to Cycle 1

Easterday et al. (2014) Design-Based Research as applied to C1 of this study						
DBR	Focus	Understand	Define	Conceive	Build	Test
C1	Specify and limit literature sources to recent articles that are relevant to this study.	Understand the context of each of the articles and the design elements that emerge from the context of the study.	Define the purpose of the SLR: the aim is to establish the first set of design elements (E1).	Conceive a scoping review and systematically discuss how other published literature agrees or disagrees with the scoping review through an SLR.	Synthesise the first set of elements (E1), based on findings in the SLR.	Apply the first set of elements to a new iteration in Cycle 2 (C2).

Source: The researcher

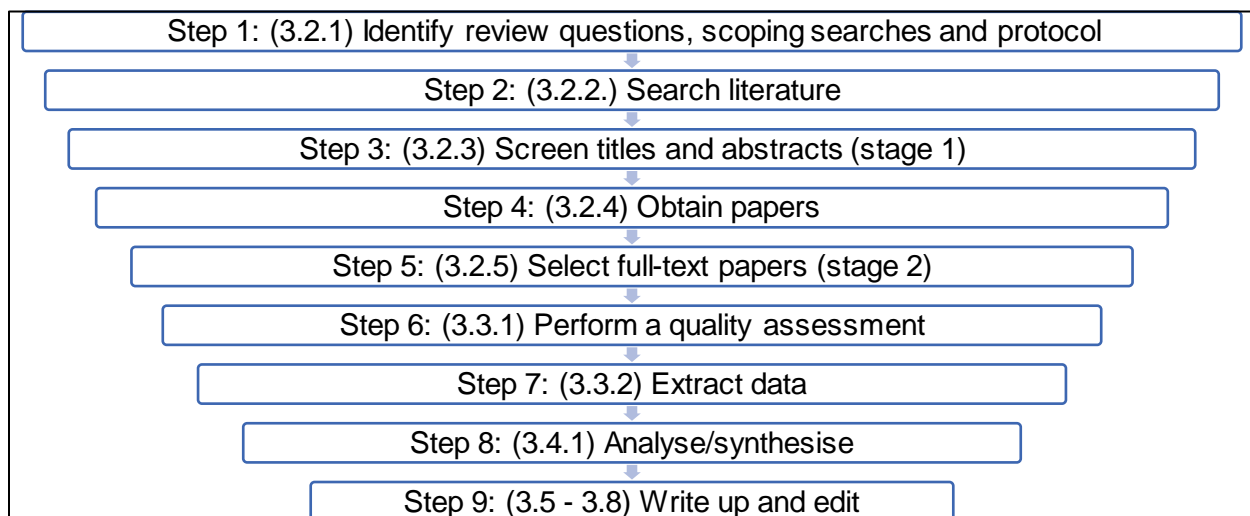
The researcher focused the literature review by screening and selecting appropriate literature. Following this, the researcher considered the context of each study selected for the review. The researcher defined the purpose of the first cycle and then screens the literature to conceive the first set of design elements. Through the SLR, the first set of elements are established and tested in Cycle 2.

3.2 SLR research protocol

The researcher performed an SLR to address the first research question. An SLR follows a research protocol (Boland et al., 2017) which guides the search, extraction, analysis and write-up process (Boland et al., 2017). The protocol followed in this SLR consists of the nine steps of an SLR as described by Boland et al. (2017).

The nine steps of the Boland et al. (2017) research protocol are outlined in Figure 3.2. A discussion on each step of the protocol follows.

Figure 3.2
 Boland et al. (2017) SLR steps

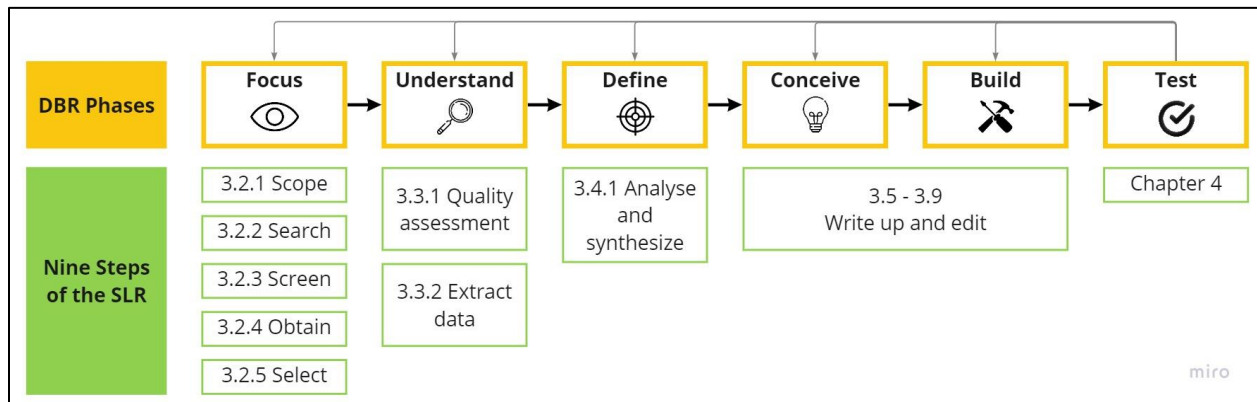


Source: Boland et al. (2017)

Each step of the SLR search protocol facilitates a narrowing process of elimination and selection from the initial scoping search to analysis, synthesis, and write-up. The researcher starts by reviewing research questions, scoping searches and the research protocol, followed by a process of searching, screening, obtaining papers, selecting papers, extracting data, analysis and synthesis and write-up.

In the following section, the Boland et al. (2017) SLR protocol is integrated with the DBR process described by Easterday et al. (2014). The researcher applies the DBR process to each cycle of the study, starting with Cycle 1, the SLR. Figure 3.3 illustrates the integration of the SLR and DBR process in the study.

Figure 3.3
DBR Phases integrated with SLR



Source: The researcher

In (3.2), the researcher *Focuses* the review through a process of scoping, searching, screening, obtaining papers and selection. In (3.3), the researcher works to *Understand* the literature through quality assessment and data extraction. In (3.4), the researcher *Defines* the SLR through analysis and synthesis. In (3.5 to 3.8), the researcher *Conceives* the SLR, by drawing on selected literature to address the research question to induce design considerations and elements through a process of write-up and editing. In (3.6), the researcher addresses the context of the study and in (3.7 and 3.8) the research focus areas (design elements and blended learning). The *Build* phase is presented in (3.9); here, the findings and results of the SLR are presented to address sub-research question 1. The *Test* phase is executed in Chapter 4, where the findings and results from Chapter 3 are tested to establish current and emerging elements and considerations.

Following this section, the researcher started the SLR and DBR process with DBR step 1: *Focus*.

3.3 FOCUS: Scope, search, screen, obtain and select papers

Focus

Specify and limit literature sources to recent articles that are relevant to this study.

During the DBR Focus phase, the researcher focused the SLR by (3.2.1) identifying review questions, scoping searches and protocol; (3.2.2) searching literature; (3.2.3) screening titles and abstracts; (3.2.4) obtaining papers; and (3.2.5) selecting full-text papers.

3.3.1 Identify review questions, scoping searches and protocol

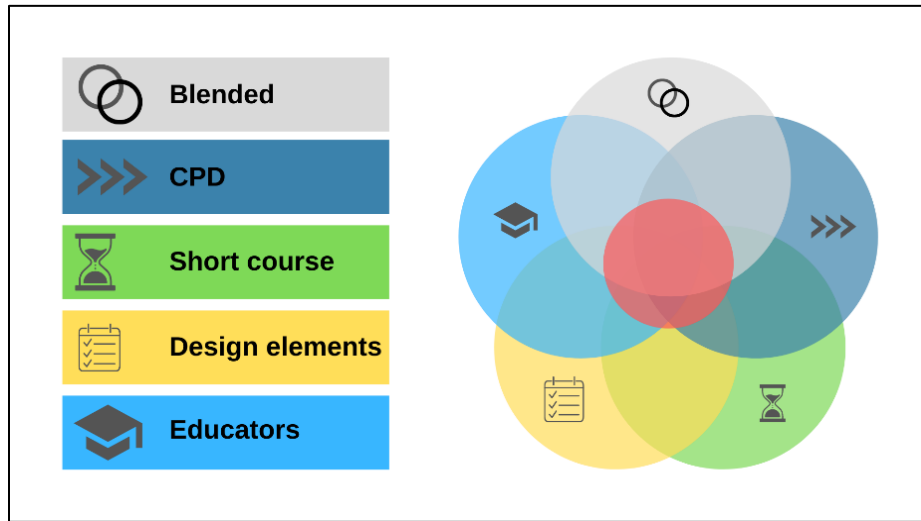
An SLR should be led by the research questions (Boland et al., 2017). The SLR presented in Chapter 3 addresses the main research question and the first sub-research question, as set out in Chapter 1. The researcher began the SLR by reading the book, 'Introduction to Instructional Systems Design: Theory and Practice' (Hodell, 2021) as a scoping review. A scoping review was done to identify what is known and where gaps exist in literature. Hodell (2021) was chosen for the scoping review due to its recent publication and its alignment with the study. The book addresses the theoretical foundations of ID; ID models; adult learning; digital learning; and LMSs.

Once a scope was established, the researcher systematically reviewed literature which addressed the context and research focus areas. This resulted in nine key-term searches in various combinations on an electronic database. The searches are described in section 3.2.2.

3.3.2 Search literature

Five key search terms were identified in the title of the study. Three key search terms address the research context, namely (1) educators; (2) CPD and (3) short courses, while two key search terms address research focus areas, namely (1) design elements and (2) blended learning. Figure 3.4 illustrates the intersecting context and research focus area search terms through a Venn diagram.

Figure 3.4
Venn diagram of SLR themes



Source: The researcher

The scoping review, using Hodell (2021), was done to address the research context and research focus areas. Through the scoping review, ADDIE emerged as a key search term for design elements. Hodell (2021) describes the ADDIE process as the five elements of ID. The scoping review was used to provide a foundation for the SLR by addressing the categories of research context, design elements and blended learning. The SLR ensued, by initiating focus on the context, with three contextual search terms and emerging additional search terms, as well as research focus search terms with arising additional search terms.

Table 3.2 indicates the searches performed, from the scoping review to the subsequent SLR.

Table 3.2
Literature search process applied in Chapter 3

Scoping review using Hodell (2021)		
Search category	Key search term	Emerging term
Context	Educator, Continuous Professional Development, Short course	Adult learner, competency-based ID, digital learning, distance learning
Research focus areas	Design elements, Blended learning	ADDIE and ISD Models, learning theory, digital learning, distance learning, Learning Management Systems
SLR search category	Key search term	Additional search term
Context	Educator	Andragogy
	Continuous Professional Development	Lifelong learner
	Short course	Duration
Research focus area	Design Elements, rooted in ADDIE	A - Analysis
		D – Design
		D – Development
		I – Implementation
Blended learning		E – Evaluation
		Learning theory
		Online learning
		Mobile learning
		Learning Management System

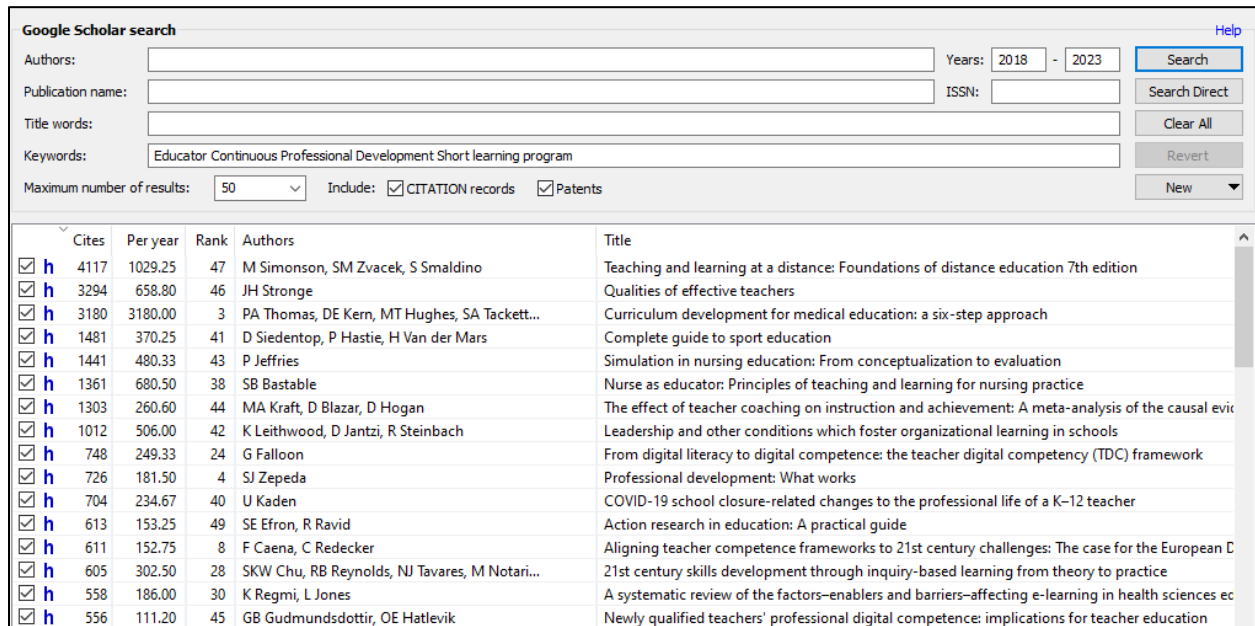
Source: The researcher

The scoping review preceded the SLR. The research context of adult learners, digital learning, ADDIE and ISD models, learning theories and an LMS are addressed by the scoping review. The researcher then performed an SLR on the context and research focus areas to add to the findings of the scoping review. Context searches included: educator, CPD, and short course. Additional search terms for context emerged, including andragogy, lifelong learner, and course duration. The research focus areas, design elements and blended learning were next addressed. Design elements were rooted in the ADDIE Model of ID, with analysis, design, development, implementation and evaluation serving as additional search terms. Blended learning was supported by additional search terms, including learning theory, online learning, mobile learning, and Learning Management System.

Upon conclusion of the scoping review, the researcher used ‘Publish or Perish’ to perform electronic key-term searches in various combinations. Data was extracted until data saturation was obtained. An example of the process is described using ADDIE and Analysis as key search terms, paired with additional search terms. The researcher paired the keyword, ADDIE Analysis, with each of the other four key search terms highlighted by Table 3.2 (e.g., ‘ADDIE Analysis’; ‘ADDIE Analysis, blended’; ‘ADDIE Analysis, Continuous Professional Development’; ‘ADDIE Analysis, short course’; ‘ADDIE Analysis, educator’). This process was repeated for each key term until data saturation was achieved.

Figure 3.5 presents an example of a Harzing’s search result obtained from the Google Scholar electronic database. The researcher limited each key-term search result to 50 results for each pairing and sorted results by the number of citations. The search results provided high quality literature, cited frequently in the field. Searches were limited to publication dates between 2018 and 2023 to keep literature current and relevant.

Figure 3. 5
Example of Harzing’s search result



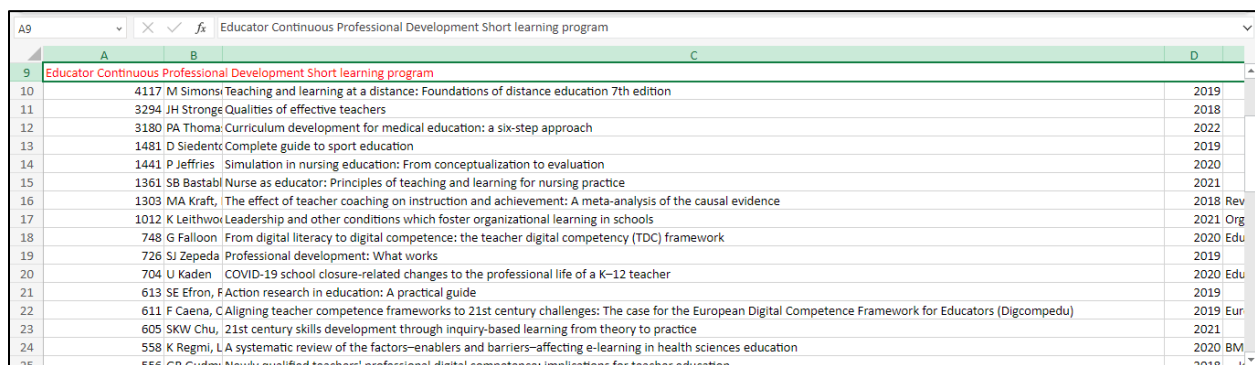
The screenshot shows the Google Scholar search interface. The search term is "Educator Continuous Professional Development Short learning program". The results are sorted by citation count, with 50 results displayed. The top results include:

Cites	Per year	Rank	Authors	Title
4117	1029.25	47	M Simonson, SM Zvacek, S Smaldino	Teaching and learning at a distance: Foundations of distance education 7th edition
3294	658.80	46	JH Stronge	Qualities of effective teachers
3180	3180.00	3	PA Thomas, DE Kern, MT Hughes, SA Tackett...	Curriculum development for medical education: a six-step approach
1481	370.25	41	D Siedentop, P Hastie, H Van der Mars	Complete guide to sport education
1441	480.33	43	P Jeffries	Simulation in nursing education: From conceptualization to evaluation
1361	680.50	38	SB Bastable	Nurse as educator: Principles of teaching and learning for nursing practice
1303	260.60	44	MA Kraft, D Blazar, D Hogan	The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence
1012	506.00	42	K Leithwood, D Jantzi, R Steinbach	Leadership and other conditions which foster organizational learning in schools
748	249.33	24	G Falloon	From digital literacy to digital competence: the teacher digital competency (TDC) framework
726	181.50	4	SJ Zepeda	Professional development: What works
704	234.67	40	U Kaden	COVID-19 school closure-related changes to the professional life of a K-12 teacher
613	153.25	49	SE Efron, R Ravid	Action research in education: A practical guide
611	152.75	8	F Caena, C Redecker	Aligning teacher competence frameworks to 21st century challenges: The case for the European Digital Competence Framework for Educators (Digcompedu)
605	302.50	28	SKW Chu, RB Reynolds, NJ Tavares, M Notari...	21st century skills development through inquiry-based learning from theory to practice
558	186.00	30	K Regmi, L Jones	A systematic review of the factors–enablers and barriers–affecting e-learning in health sciences education
556	111.20	45	GB Gudmundsdottir, OE Hatlevik	Newly qualified teachers' professional digital competence: implications for teacher education

Source: The researcher

The search results were captured for screening and selection using Microsoft Excel. Figure 3.6 illustrates the search results captured in Excel.

Figure 3. 6
Search result captured in Microsoft Excel



The screenshot shows a Microsoft Excel spreadsheet with the search results from Figure 3.5. The data is organized into columns for Cites, Per year, Rank, Authors, Title, and Year. The first few rows are:

Cites	Per year	Rank	Authors	Title	Year
4117	1029.25	47	M Simonson, SM Zvacek, S Smaldino	Teaching and learning at a distance: Foundations of distance education 7th edition	2019
3294	658.80	46	JH Stronge	Qualities of effective teachers	2018
3180	3180.00	3	PA Thomas, DE Kern, MT Hughes, SA Tackett...	Curriculum development for medical education: a six-step approach	2022
1481	370.25	41	D Siedentop, P Hastie, H Van der Mars	Complete guide to sport education	2019
1441	480.33	43	P Jeffries	Simulation in nursing education: From conceptualization to evaluation	2020
1361	680.50	38	SB Bastable	Nurse as educator: Principles of teaching and learning for nursing practice	2021
1303	260.60	44	MA Kraft, D Blazar, D Hogan	The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence	2018 Rev
1012	506.00	42	K Leithwood, D Jantzi, R Steinbach	Leadership and other conditions which foster organizational learning in schools	2021 Org
748	249.33	24	G Falloon	From digital literacy to digital competence: the teacher digital competency (TDC) framework	2020 Edu
726	181.50	4	SJ Zepeda	Professional development: What works	2019
704	234.67	40	U Kaden	COVID-19 school closure-related changes to the professional life of a K-12 teacher	2020 Edu
613	153.25	49	SE Efron, R Ravid	Action research in education: A practical guide	2019
611	152.75	8	F Caena, C Redecker	Aligning teacher competence frameworks to 21st century challenges: The case for the European Digital Competence Framework for Educators (Digcompedu)	2019 Eur
605	302.50	28	SKW Chu, RB Reynolds, NJ Tavares, M Notari...	21st century skills development through inquiry-based learning from theory to practice	2021
558	186.00	30	K Regmi, L Jones	A systematic review of the factors–enablers and barriers–affecting e-learning in health sciences education	2020 BM
556	111.20	45	GB Gudmundsdottir, OE Hatlevik	Newly qualified teachers' professional digital competence: implications for teacher education	2018

Source: The researcher

3.3.3 Screen titles and abstracts

Defining inclusion and exclusion criteria is essential for an SLR (Boland et al., 2017). Articles were screened through the search and limited to academic literature published between 2018 and 2023. Seminal sources, however, referenced in screened articles, even when published before 2018, were consulted and screened for inclusion. Table 3.2 illustrates the inclusion and exclusion criteria applied for the SLR:

Table 3.3
Inclusion and exclusion criteria

Description	Include	Exclude
Topic and key terms	Addresses the context or one or more of the research focus areas: <i>design elements, blended, CPD, short course</i> and <i>educators</i> .	Does not address the context or one or more of the research focus areas: <i>design elements, blended, CPD, short course</i> or <i>educators</i> .
Publication date	Published between 2018 and 2023 or sources which were referenced and published in the past five years.	Not published or referenced within the last 5 years.
Utilisation	Implications for practice or further research addressed.	Implications for practice or further research not addressed.
Language	English	Not English
Accessibility	Accessible in e-book, online- or online PDF format.	Not accessible in e-book, online- or online PDF format.
Title	Addresses the context or one or more of the research focus areas: <i>design elements, blended, CPD, short course</i> and <i>educators</i> .	Does not address the context or one or more of the research focus areas: <i>design elements, blended, CPD, short course</i> or <i>educators</i> .

Source: The researcher

When screening titles and abstracts, articles were organised according to the number of citations they received in other publications. Articles with the most citations were sorted at the top, with the least citations at the bottom. Preference was given to articles with more citations, due to their relevance in the field. Figure 3.7 illustrates how Harzing's 'Publish or Perish' was used to rank search results according to number of citations, for screening of titles and abstracts.

Figure 3.7
Ranking and screening of titles and abstracts

Google Scholar search Help

Authors: Years: 2018 - 2023 Search

Publication name: ISSN: Search Direct

Title words: Clear All

Keywords: Educator Continuous Professional Development Short learning program Revert

Maximum number of results: 50 Include: CITATION records Patents New

	Cites	Per year	Rank	Authors	Title
<input checked="" type="checkbox"/>	4117	1029.25	47	M Simonson, SM Zvacek, S Smaldino	Teaching and learning at a distance: Foundations of distance education 7th edition
<input checked="" type="checkbox"/>	3294	658.80	46	JH Stronge	Qualities of effective teachers
<input checked="" type="checkbox"/>	3180	3180.00	3	PA Thomas, DE Kern, MT Hughes, SA Tackett...	Curriculum development for medical education: a six-step approach
<input checked="" type="checkbox"/>	1481	370.25	41	D Siedentop, P Hastie, H Van der Mars	Complete guide to sport education
<input checked="" type="checkbox"/>	1441	480.33	43	P Jeffries	Simulation in nursing education: From conceptualization to evaluation
<input checked="" type="checkbox"/>	1361	680.50	38	SB Bastable	Nurse as educator: Principles of teaching and learning for nursing practice
<input checked="" type="checkbox"/>	1303	260.60	44	MA Kraft, D Blazar, D Hogan	The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evic
<input checked="" type="checkbox"/>	1012	506.00	42	K Leithwood, D Jantzi, R Steinbach	Leadership and other conditions which foster organizational learning in schools
<input checked="" type="checkbox"/>	748	249.33	24	G Falloon	From digital literacy to digital competence: the teacher digital competency (TDC) framework
<input checked="" type="checkbox"/>	726	181.50	4	SJ Zepeda	Professional development: What works
<input checked="" type="checkbox"/>	704	234.67	40	U Kaden	COVID-19 school closure-related changes to the professional life of a K-12 teacher
<input checked="" type="checkbox"/>	613	153.25	49	SE Efron, R Ravid	Action research in education: A practical guide
<input checked="" type="checkbox"/>	611	152.75	8	F Caena, C Redecker	Aligning teacher competence frameworks to 21st century challenges: The case for the European D
<input checked="" type="checkbox"/>	605	302.50	28	SKW Chu, RB Reynolds, NJ Tavares, M Notari...	21st century skills development through inquiry-based learning from theory to practice
<input checked="" type="checkbox"/>	558	186.00	30	K Regmi, L Jones	A systematic review of the factors-enablers and barriers-affecting e-learning in health sciences ec
<input checked="" type="checkbox"/>	556	111.20	45	GB Gudmundsdottir, OE Hatlevik	Newly qualified teachers' professional digital competence: implications for teacher education

Source: The researcher

Once search results were obtained and organised, the researcher screened titles and abstracts in Microsoft Excel. Titles which were not in English; articles which were inaccessible; and titles which were irrelevant were screened using colours and excluded from the review. Figure 3.8 illustrates an example of applied exclusion criteria and search results across 82 screened articles.

Figure 3.8
Applied exclusion criteria in Microsoft Excel

A22 ADDIE, analysis [keyword]

	A	B	C	D	E	F	G	H	I
14	Key:								
15	Not english	11							
16	Inaccessible	10							
17	Title Not Relevant	7							
18	Read only, not cited	23							
19	Cited	42							
20	Total	82							
21									
22	ADDIE, analysis [keyword]								
23	Cites	Authors	Title	Year	Publication	Publishers			Rank
24	33	RA Salas-Rueda, Eí Analysis		2020	International Journal of ...	ERIC https://eric.ed.gov/?id=EJ12632	https://scholar.google.com/		1
25	42	T Alodwan, M Alm The Effe		2018	English Language Teaching	ERIC https://eric.ed.gov/?id=EJ11734	https://scholar.google.com/		2
26	114	E Widyastuti Using th		2019	Journal of Physics: Conference Series	iopsc https://iopscience.iop.org/article/	https://scholar.google.com/		3
27	27	F Hidayat, N Muha Model J		2021	JIPAI; Jurnal Inovasi Pendidikan ...	schol https://scholar.archive.org/work	https://scholar.google.com/		4
28	18	L Iswati Develoç		2019	Indonesian EFL Journal	journ https://journal.uniku.ac.id/index	https://scholar.google.com/		5
29	1	S Cotter, J Yamamç A syster		2022	Food Control	Elsevi https://www.sciencedirect.com/	https://scholar.google.com/		6
30	19	A Bambara, D Chau Analise		2018	Journal of Smart Education and Urban	inial https://www.inidphal.com/arti	https://scholar.google.com/		7

Instructional Design **ADDIE Analysis** ADDIE Design Context 1 - 3 Learning theories +

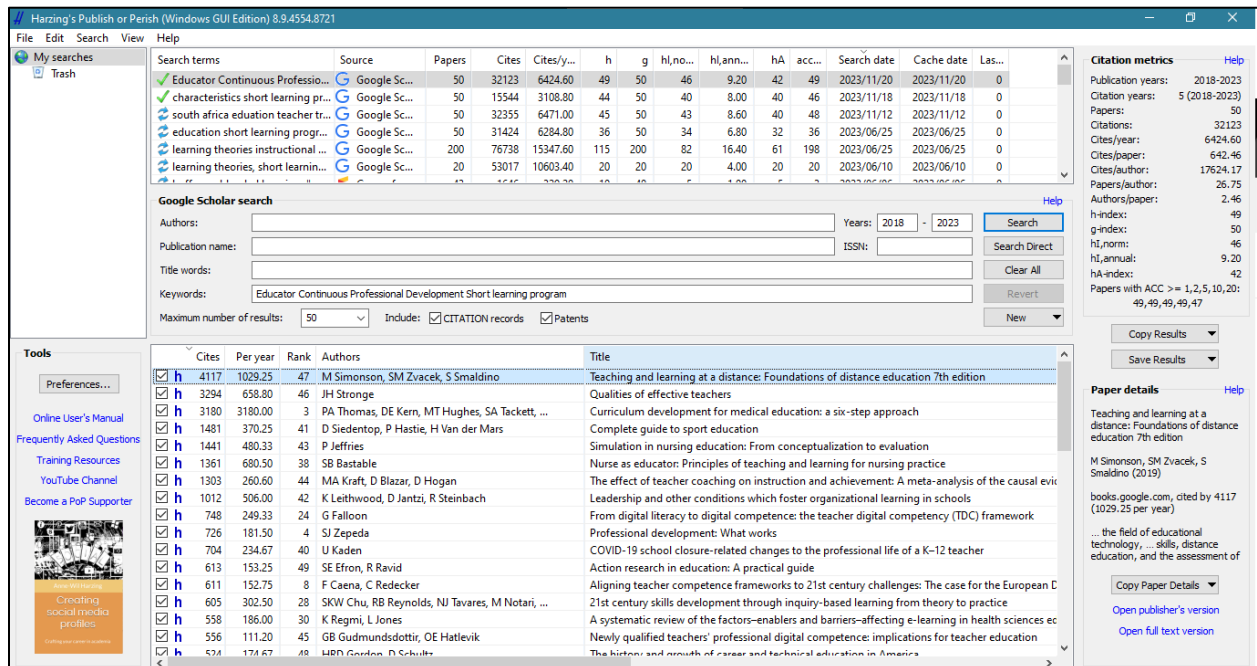
Source: The researcher

3.3.4 Obtain papers

Screened papers which met the screening criteria were obtained using Harzing's 'Publish or Perish', and papers were obtained from the Google Scholar database. In cases where the results could not be accessed from the Google Scholar database, a search was performed on the University library, using the title of the selected article.

In Figure 3.9, a search result with 4 117 citations since publication in 2019 is highlighted.

Figure 3.9
 Search results in Publish or Perish



The screenshot shows the Harzing's Publish or Perish software interface. The main window displays a table of search results. The top row is highlighted in blue, indicating the selected paper. The table columns include: Search terms, Source, Papers, Cites, Cites/y..., h, g, hI, no..., hI, ann..., hA, acc..., Search date, Cache date, and Las... The selected paper has 4117 citations and was published in 2019.

Search terms	Source	Papers	Cites	Cites/y...	h	g	hI, no...	hI, ann...	hA	acc...	Search date	Cache date	Las...
Educator Continuous Professional Development Short learning program	Google Sc...	50	32123	6424.60	49	50	46	9.20	42	49	2023/11/20	2023/11/20	0
characteristics short learning program	Google Sc...	50	15544	3108.80	44	50	40	8.00	40	46	2023/11/18	2023/11/18	0
south africa education teacher training	Google Sc...	50	32355	6471.00	45	50	43	8.60	40	48	2023/11/12	2023/11/12	0
education short learning program	Google Sc...	50	31424	6284.80	36	50	34	6.80	32	36	2023/06/25	2023/06/25	0
learning theories instructional design	Google Sc...	200	76738	15347.60	115	200	82	16.40	61	198	2023/06/25	2023/06/25	0
learning theories, short learning program	Google Sc...	20	53017	10603.40	20	20	20	4.00	20	20	2023/06/10	2023/06/10	0

The 'Tools' section at the bottom shows a list of results with columns for Cites, Per year, Rank, Authors, and Title. The top result is highlighted:

Cites	Per year	Rank	Authors	Title
4117	1029.25	47	M Simonson, SM Zvacek, S Smaldino	Teaching and learning at a distance: Foundations of distance education 7th edition
3294	658.80	46	JH Stronge	Qualities of effective teachers
3180	3180.00	3	PA Thomas, DE Kern, MT Hughes, SA Tackett, ...	Curriculum development for medical education: a six-step approach
1481	370.25	41	D Siedentop, P Hastie, H Van der Mars	Complete guide to sport education
1441	480.33	43	P Jeffries	Simulation in nursing education: From conceptualization to evaluation
1361	680.50	38	SB Bastable	Nurse as educator: Principles of teaching and learning for nursing practice
1303	260.60	44	MA Kraft, D Blazar, D Hogan	The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence
1012	506.00	42	K Leithwood, D Jantzi, R Steinbach	Leadership and other conditions which foster organizational learning in schools
748	249.33	24	G Falloon	From digital literacy to digital competence: the teacher digital competency (TDC) framework
726	181.50	4	SJ Zepeda	Professional development: What works
704	234.67	40	U Kaden	COVID-19 school closure-related changes to the professional life of a K-12 teacher
613	153.25	49	SE Efron, R Ravid	Action research in education: A practical guide
611	152.75	8	F Caena, C Redecker	Aligning teacher competence frameworks to 21st century challenges: The case for the European Dimension
605	302.50	28	SKW Chu, RB Reynolds, NJ Tavares, M Notari, ...	21st century skills development through inquiry-based learning from theory to practice
558	186.00	30	K Regmi, L Jones	A systematic review of the factors-enablers and barriers-affecting e-learning in health sciences education
556	111.20	45	GB Gudmundsdottir, OE Hatlevik	Newly qualified teachers' professional digital competence: implications for teacher education
524	174.67	48	HRD Gordon, D Schultz	The history and growth of career and technical education in America

Source: The researcher

In cases where search results could not be obtained through the Google Scholar search engine, the researcher used the dedicated University library search engine to obtain papers.

3.3.5 Select full-text papers

Upon screening and obtaining papers, the researcher selected full-text papers which met review criteria for the SLR. Figure 3.10 illustrates how 23 texts were read and 42 cited on a combined search result of 82 papers, with two of the key terms, 'ADDIE' and 'Analysis'.

Figure 3. 10
Selection and tracking in Microsoft Excel



Key:									
Not english		11							
Inaccessible		10							
Title Not Relevant		7							
Read only, not cited		28							
Cited		42							
Total		82							

Cites	Authors	Title	Year	Publication	Publishers	Rank
33	RA Salas-Rueda, E	Analysis	2020	International Journal of ...	ERIC https://eric.ed.gov/?id=EJ12632 https://scholar.google.com/	1
42	T Alodwan, M Alm	The Effe	2018	English Language Teaching	ERIC https://eric.ed.gov/?id=EJ11734 https://scholar.google.com/	2
114	E Widayastuti	Using tr	2019	Journal of Physics: Conference Series	iopsc https://iopscience.iop.org/article/ https://scholar.google.com/	3
27	F Hidayat, N Muha	Model J	2021	JIPAI: Jurnal Inovasi Pendidikan ...	schol https://scholar.archive.org/work/ https://scholar.google.com/	4
18	L Iswath	Develo	2019	Indonesian EFL Journal	journ https://journal.uniku.ac.id/index https://scholar.google.com/	5
1	S Cotter, J Yamam	A syster	2022	Food Control	Eisevi https://www.sciencedirect.com/ https://scholar.google.com/	6

Source: The researcher

3.4 UNDERSTAND: Quality assessment and data extraction.

Understand

Understand the context, elements and considerations that emerge from each article.

The Understand phase of the review aims to understand how literature, located through the SLR, supports and challenges the views of Hodell (2021) and forms considerations and elements of course design. Each paper was analysed, summarised, and used to synthesise findings which address the research question in the form of text, figures, and tables. The researcher made use of narrative analysis (Grbich, 2013).

3.4.1 Perform quality assessment

The researcher only included articles which met the screening criteria as described in 3.2.3.

3.4.2 Extract data

The researcher used the computer search tool, Harzing's 'Publish or Perish' to perform searches on the Google Scholar electronic database. Each search was limited to articles published between 2018 and 2023. A maximum number of 50 search results was set as a restriction for each search pairing to save time and minimise search results to seminal sources with many citations.

Table 3.4 illustrates the searches performed by the researcher.

Table 3.4
SLR searches, results, and citations

Scoping review using Hodell (2021)				
Search category	Key search term	Emerging term	Results	Citations
Context	Educator, Continuous Professional Development, Short course	Adult learner, competency-based ID, digital learning, distance learning	1	1
Research focus areas	Design elements, Blended learning	ADDIE and ISD Models, learning theory, digital learning, distance learning, Learning Management Systems	1	1
SLR search category	Key search term	Additional search term	Results	Citations
Context	Educator	Andragogy	250	12
	Continuous Professional Development	Lifelong learner		14
	Short course	Duration		9
Research focus area	Design Elements, rooted in ADDIE	A - Analysis D – Design D – Development I – Implementation E – Evaluation	950	61
		Blended learning	250	66
	Learning theory			
	Online learning			
Mobile learning				
Learning Management System				
Summary of search results and citations			1451	163

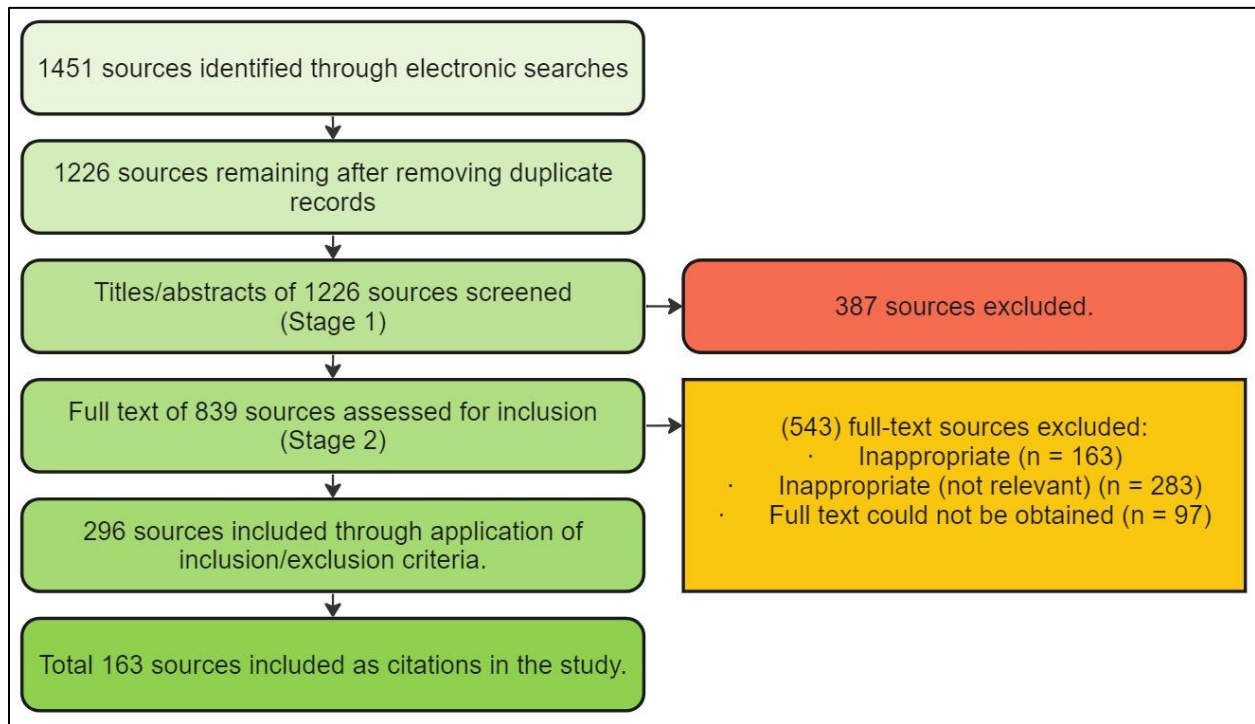
Source: The researcher

Upon conclusion of the scoping review, the researcher paired key search terms for context and research focus areas with additional search terms. Key search terms were paired with additional search terms. Each search result was limited to 50 publications and sorted according to citations in published literature. The numbers of results and citations for each key search term are displayed in Table 3.4. The researcher used a total of 1451 search results and 163 citations in the SLR. An example of the search process is described in 3.2.2.

3.4.3 Inclusion and exclusion of references

Figure 3.11 illustrates the process followed when applying the inclusion and exclusion criteria and the search results for this SLR. The figure illustrates the resources included and excluded in the analysis and write-up phases.

Figure 3. 11
SLR resource inclusion and exclusion

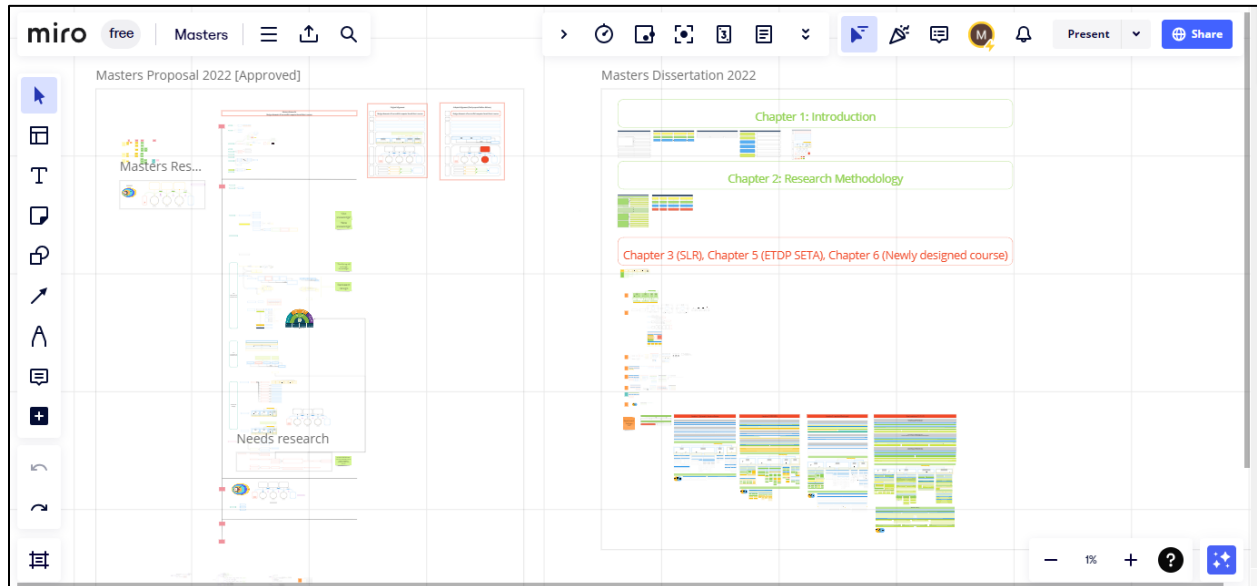


Source: Boland et al. (2017)

There were 1451 references identified while searching for sources; 225 duplicate searches were removed; 1226 titles and abstracts were considered while screening articles; 839 references were examined when selecting full-text papers; and 543 papers were excluded while applying the screening and selection tool during stage 2. These sources were excluded because they were not in English, or were inaccessible, or the title was not relevant to the study, or were only read, but not cited. There were 296 sources included through application of inclusion/exclusion criteria, with 163 sources included as citations in the study.

Data extraction was done using a computer mind-mapping program called 'Miro'. Miro offers a blank canvas on which the researcher could create mind-maps to connect themes, elements and considerations and manipulate the mind-map as ideas develop. Miro was used to extract data, organise thoughts, and visually analyse and present findings throughout the SLR (Chapter 3) and the rest of the study (Chapter 4–6). Individual figures are presented with discussions throughout the SLR and the study. Figure 3.12 illustrates the working Miro canvas which was used to store and interact with from the proposal approval phase to the end of the study.

Figure 3.12
Data extraction using Miro



Source: The researcher

Figure 3.12 presents a zoomed-out view of the min-map created through the data extraction, synthesis and write-up process from the approved proposal to completion of the dissertation. Individual figures and mind-maps are presented and discussed throughout the study.

3.5 DEFINE: Methods of synthesis

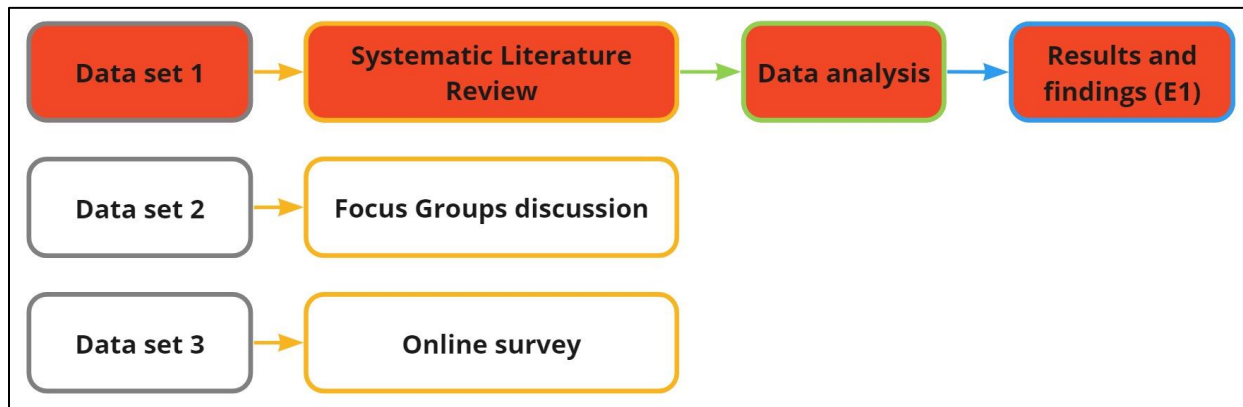
Define

Define the purpose of the SLR.

The purpose of the SLR is to establish the first set of design elements (E1).

The purpose of the SLR is to collect and analyse data in the form of published academic literature and induce the first set of elements of blended CPD short course design for educators (E1). The results and findings (E1) in Cycle 1 are inductively synthesised through systematic data analysis and narrative synthesis. The scoping review informs a foundation for points of discussion and argumentation which will be visible through Chapter 3. The SLR involves systematic engagement, review and analysis of literature pertaining to the context and research focus areas to induce the first set of elements. The research process is illustrated in Figure 3.13.

Figure 3. 13
Method of synthesis in Cycle 1



Source: The researcher

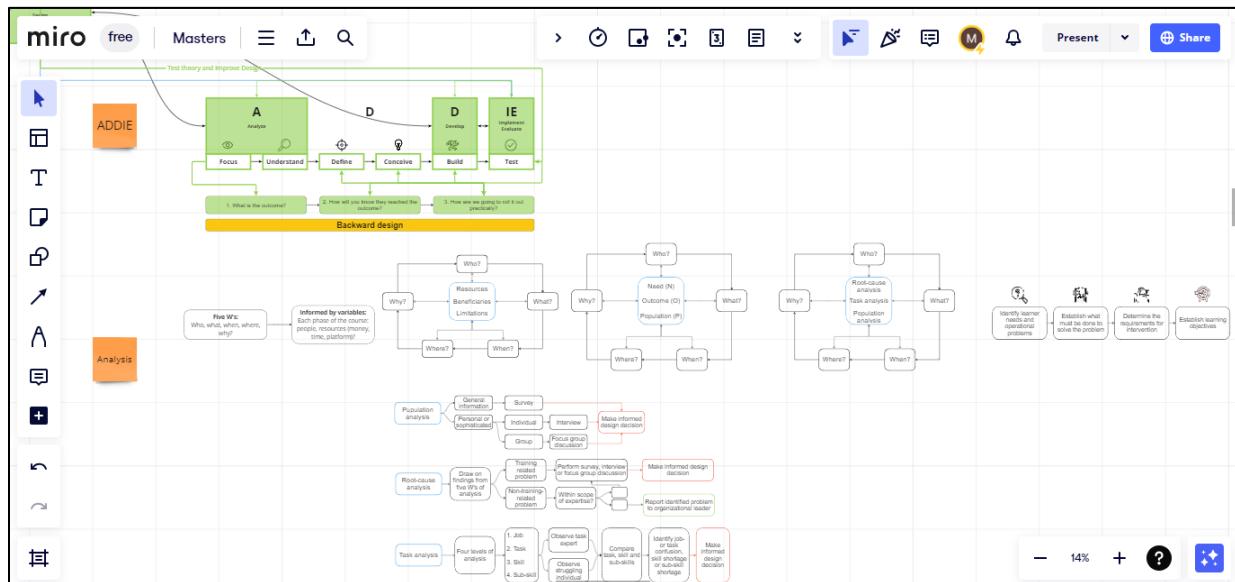
Figure 3.13 presents dataset 1, Cycle 1, Chapter 3, SLR. The purpose of Cycle 1 is to draw on literature to establish the first set of elements of course design and address the first sub-research question.

The findings and results from Chapter 3 form themes which are explored further in Cycles 2 and 3 to either support the findings or challenge the findings from the perspective of other research participants. The findings and results of the SLR address the first sub-research question and form the first step in addressing the main research question as a conclusion to the study.

3.5.1 Analyse and synthesise

Analysis and synthesis of the extracted data took place utilising a combination of the Miro computer program and Microsoft Word. The researcher analysed, organised, sorted, and presented broad ideas as findings and results through Miro. Microsoft Word was used to facilitate in-depth synthesis, by drawing on Miro to organise, synthesise and present findings. Figure 3.14 illustrates an example of how Miro was used to organise the researcher's thoughts as a first step toward synthesis of the findings and results.

Figure 3.14
Data analysis and synthesis using Miro



Source: The researcher

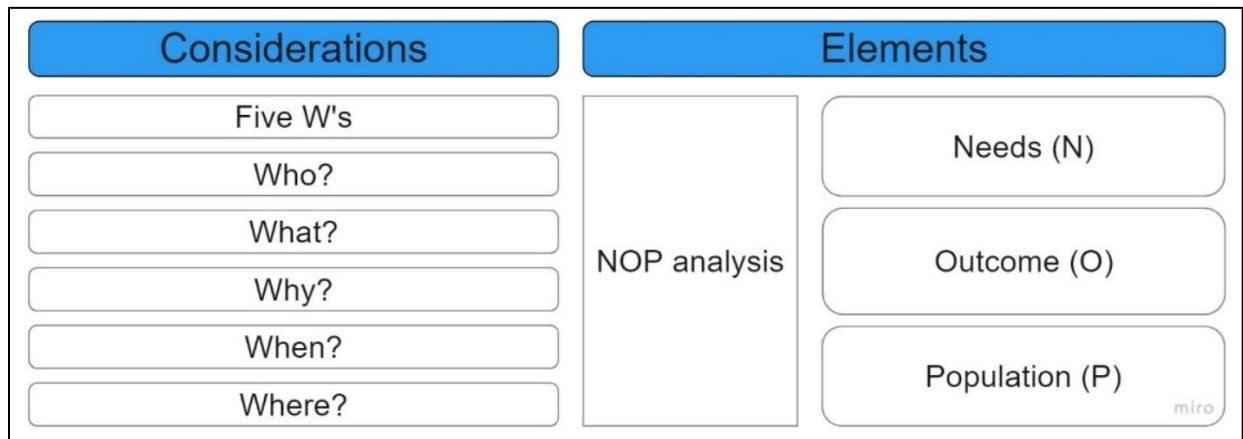
Figure 3.14 presents a zoomed-out view of the data extracted for ADDIE and the ADDIE Analysis phase. These figures were mapped out for the researcher to see, understand, and manipulate ideas as they arose from literature and are presented throughout Chapter 3 in the write-up phase. Figures on Miro guided the researcher’s thoughts, while figures included in the dissertation present findings and results.

3.5.2 Considerations and elements

The researcher aimed to induce elements of course design but found additional factors which are not interpreted as elemental, though they could be considered. Elements emerge as critical parts of course design, while considerations emerge as broad factors which can be considered in addition to elements. Elements need to receive prominent support from the data in Cycle 1, Cycle 2 and Cycle 3, while considerations might feature in some cycles, or be expressed with less significance.

Figure 3.15 illustrates an example of the broad nature of considerations and specific nature of elements. The example illustrated relates to ADDIE Analysis, as discussed in 3.7.3, Phase 1: Analysis, later in the chapter.

Figure 3.15
Presenting findings through Miro



Source: The researcher

Figure 3.15 illustrates an example of differentiation between considerations and elements. Five W's are distinguished from NOP Analysis, as discussed in ADDIE Analysis, in 3.7.3.

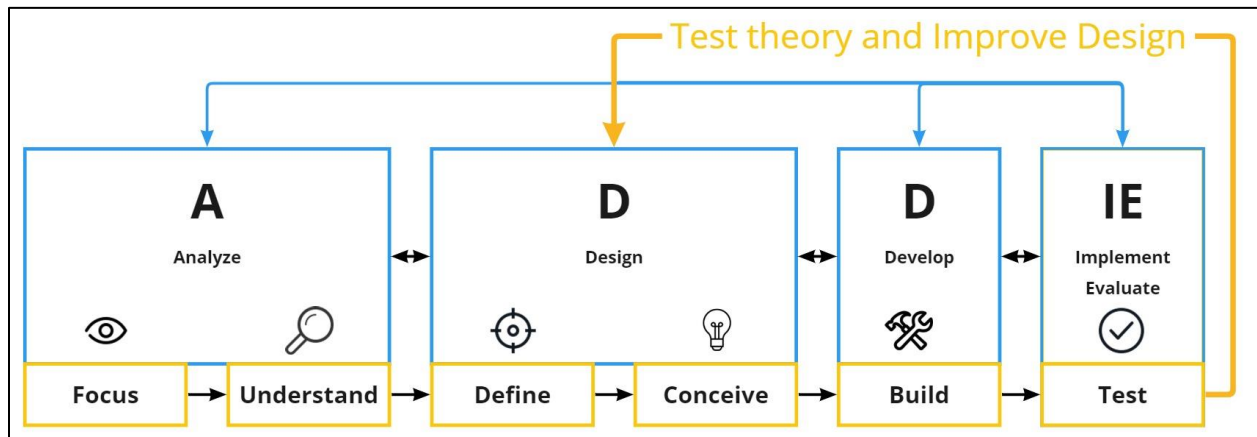
3.5.3 Integrating ADDIE and DBR

The researcher integrated the ADDIE Model of ID with the Easterday et al. (2014) DBR process. The DBR process is described in Chapter 2.5 (research design) while the ADDIE Model of ID is discussed in Chapter 3.7.3. A brief overview of its intersectionality is provided here.

Analysis is intended to focus and understand the research problem, context, and participants. During the ADDIE Design phase, goals, assessments, and a possible solution to the problem is drafted and designed. The plan to address the problem is conceived for development. During the ADDIE Development phase, the solution is built for implementation. During the ADDIE Implementation and Evaluation phases, the solution is implemented and tested for its effectiveness is addressing the problem.

Figure 3.16 illustrates the overlap between the DBR and ADDIE process, as applied in this study.

Figure 3. 16
ADDIE and DBR integrated.



Source: The researcher

Figure 3.16 illustrates the ADDIE ID Model (blue) and Easterday et al. (2014) DBR process (orange). The researcher applied a DBR strategy throughout the study, yet ADDIE emerged as the backbone of ID. The ADDIE Model, as described in this study, is reflexive, iterative and intended to continuously review and improve design, during each phase of the model as described by DBR.

3.6 CONCEIVE: Findings and results

In this section, the researcher entered phase four, Conceive, of the DBR process as described by Easterday et al. (2014). The researcher aimed to conceive the first set of design elements for educators who want to partake in CPD in the form of a blended short course.

Conceive

Conceive a scoping review and systematically discuss how other published literature agrees or disagrees with the scoping review through an SLR.

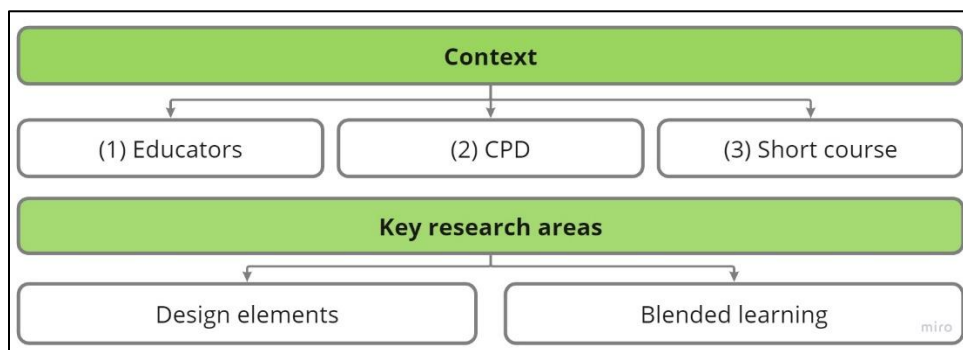
3.6.1 Conceive applied to the study

The researcher initialised the Conceive phase by performing a scoping review based on Hodell (2021). The context and research focus areas were reviewed systematically through the SLR. The researcher systematically drew on current literature to support or challenge the ideas presented by Hodell (2021). The findings and results of the SLR revealed the first set of design elements (E1).

The researcher began the review by describing ID, which guided the design process. The researcher focused on the ADDIE Model as the model of choice in this study.

The SLR addressed each key term in the title of the study, namely: *elements; blended; continuous professional development; short course; design; educators*. The five elements are divided into contextual focus areas and research focus areas. The context in which this study is framed includes *educators, CPD* and *short course*. The key research areas of the study are *design elements* and *blended learning*. Figure 3.17 illustrates the contextual and research focus of this study.

Figure 3.17
Context and research areas



Source: The researcher

Figure 3.17 illustrates the research context, namely educators, CPD and short course, and two research focus areas, namely design elements and blended learning, addressed by the study.

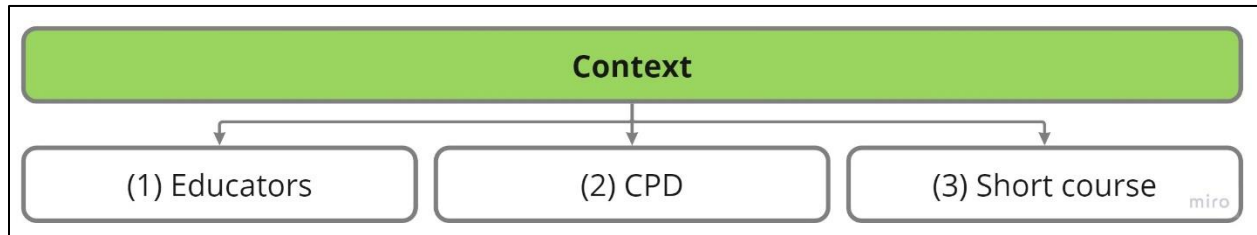
3.6.2 Write-up and edit

Sections 3.6 to 3.9 present the analysis, findings and results used in the write-up and edit phase of the SLR. In (3.6) the researcher addresses the contextual elements of the study; in (3.7) the researcher addresses research focus (1): Design elements; in (3.8) the researcher addresses research focus area (2): Blended learning, while in (3.9) the researcher presents the findings and results as a conclusion to Chapter 3.

3.7 Context

In this section, the context of this study is outlined. Designers should not only consider design principles, but also contextual factors when designing a blended learning course. The researcher addresses three contextual factors in this study, namely (1) educators; (2) CPD; and (3) short courses. Figure 3.18 illustrates the three contextual factors pertaining to this study.

Figure 3. 18
Context of the study



Source: The researcher

Figure 3.18 illustrates that the context of the study is made up of three parts, namely educators, CPD and short courses. The researcher commences the DBR Conceive phase by addressing contexts 1–3.

3.7.1 Context: Educators

In this section, the researcher describes the first context of the study, the target audience, namely, educators. Educators take on various roles and responsibilities. Stronge (2018) describes eight educator roles, including professional knowledge; instructional planning; instructional delivery; assessment; learning environment; professionalism and the ability to use resources effectively.

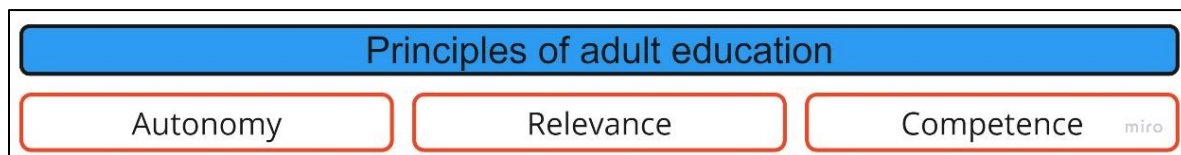
Three considerations emerged when reviewing literature on context (1): Educators. Firstly, the characteristics, needs, abilities, and constraints in adult and child education are very different (Hodell, 2021; Merriam & Baumgartner, 2020). Educators are adults and therefore ascribe to the principles of andragogy (adult education) (Hodell, 2021; Zepeda, 2019). Secondly, designers need to understand the needs of the adult learner and lastly, adults have limited time available for CPD due to the demands on them as they enter a course.

Learning theories associated with adult learning, addressed in the SLR, are andragogy (Diep et al., 2019; Hodell, 2021; Merriam & Baumgartner, 2020), self-directed learning (Ratheeswari, 2018), transformative learning, experience learning (Merriam & Baumgartner, 2020), self-determination theory, constructivism (Ratheeswari, 2018), socio-constructivism (Diep et al., 2019), behaviorism, and connectivism (Diep et al., 2019; Jalinus et al., 2021).

Hodell (2021) and Merriam and Baumgartner (2020) describe six 'principles' of adult education. These authors, among others, state that adults: (1) need to know why they learn something (Alsaleh, 2020; Diep et al., 2019; Hodell, 2021; Merriam & Baumgartner, 2020); (2) develop through self-directed learning (Hodell, 2021; Mamun et al., 2020; Merriam & Baumgartner, 2020; Muliwati et al., 2020); (3) have rich lived experiences to share (Alsaleh, 2020; Hodell, 2021; Merriam & Baumgartner, 2020); (4) bring predetermined social roles and responsibilities to a course (Diep et al., 2019; Goodson & Nilson, 2017; Hodell, 2021; Merriam & Baumgartner, 2020); (5) have a problem-centered approach to learning (Alsaleh, 2020; Diep et al., 2019; Education, 2021; Goodson & Nilson, 2017; Hodell, 2021; Merriam & Baumgartner, 2020); and (6) have higher intrinsic motivation when learning is relevant and aligned with their goals (Alsaleh, 2020; Diep et al., 2019; Hodell, 2021; Merriam & Baumgartner, 2020).

Diep et al. (2019) condenses these six principles to three principles of adult learning, namely, (1) Autonomy; (2) Relevance and (3) Competence. Adults want to take control of their learning; adults want learning experiences to be relevant and adult learners want to be seen as competent, self-directed learners (Diep et al., 2019). Figure 3.19 illustrates the three principles of adult learning programmes induced from context 1: Educators.

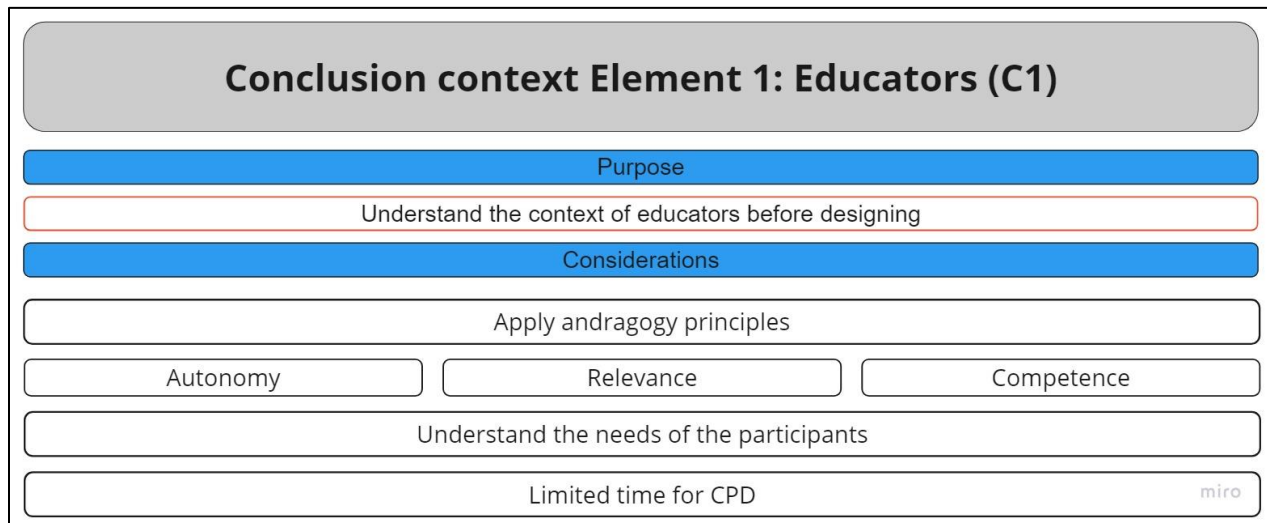
Figure 3. 19
Three principles of adult learning programmes



Source: The researcher

Figure 3.20 presents the conclusion to considerations of context (1): Educators.

Figure 3.20
Conclusion, Context Element 1 (Cycle 1)



Source: The researcher

Designers need to understand the context of the course participants and apply the principles of andragogy when designing a course. The core principles of andragogy include autonomy, relevance, and competence. Designers need to understand the needs of the participants, as will be discussed in ADDIE Analysis. Lastly, adult CPD participants have limited time available for CPD.

3.7.2 Context: Continuous Professional Development

In this section, the researcher describes the second context of the study, the purpose of participation in a course, namely, CPD. CPD is the planned (Peleman et al., 2018), systematic and ongoing process of education (Ismail & Jaafar, 2022), with the purpose of increasing skills, knowledge, and professional attitudes (Arisanti et al., 2019; Wahjusaputri et al., 2022). CPD acknowledges that individuals are lifelong learners (Brouwer, Fleerackers, et al., 2022; Brouwer, Maciejowska, et al., 2022; Ismail & Jaafar, 2022; Ong et al., 2021). CPD programmes complement, update and consolidate professional knowledge of individuals and teams (Peleman et al., 2018).

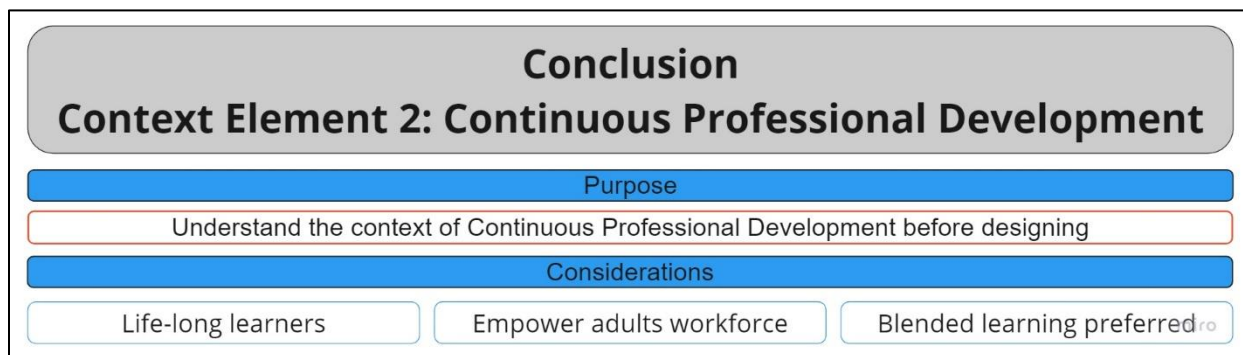
CPD decreases employee attrition (Arisanti et al., 2019; Zepeda, 2019); closes skills gaps (Ismail & Jaafar, 2022); leads to self-development; keeps participants updated to recent work-and-world trends; improves efficiency (Stemp et al., 2022); and drives innovation (Wahjusaputri et al., 2022). Employees who participate in CPD feel confident and secure in their roles and work more effectively (Ismail & Jaafar, 2022). CPD results in increased awareness of practice (Zepeda, 2019), a greater sense of agency and competence; increased confidence; improved skills and

practice and increased inter-professional collaboration and engagement (Peleman et al., 2018; Sayed, 2018; Zepeda, 2019).

CPD programmes should not interfere with participants’ work lives (Kolcu et al., 2020). Participants respond well to active learning components such as discussions, reflection, development of plans and peer-assessment (Brouwer, Fleerackers, et al., 2022). To facilitate active engagement, CPD should be contextually and operationally integrated in participants’ working lives, rather than presented as ‘once-off’ training courses (Peleman et al., 2018; Zepeda, 2019). Integrated CPD programmes can be achieved through a combination of synchronous, asynchronous and blended learning (Sayed, 2018).

Figure 3.21 presents the conclusion to the purpose and considerations of Context Element 2: CPD for Chapter 3, SLR.

Figure 3. 21
Conclusion, Context Element 2 (Cycle 1)



Source: The researcher

Figure 3.21 shows that designers need to understand the context of the CPD work- and learning environment before designing a course. Designers need to consider that participants are lifelong learners, who want to be empowered by course participation and do so optimally when a blended learning medium enables development without work interference.

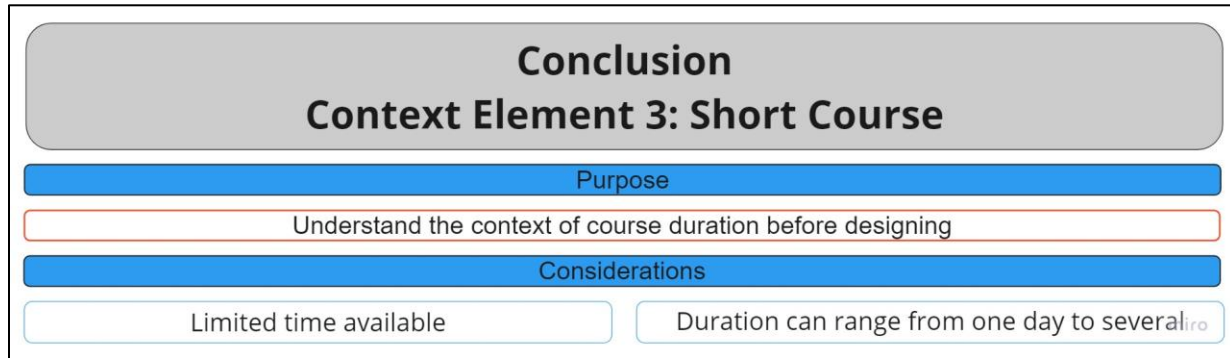
3.7.3 Context: Short course

In this section, the researcher describes the third and last context of the study, the duration of the learning programme, namely, short course. Adult workers have limited time available for participation in training and development programmes (Merriam & Baumgartner, 2020), which explains why participation in long, inflexible CPD programmes is low (Wahjusaputri et al., 2022). Designers can support adult learning through a combination of micro-learning strategies (Merriam

& Baumgartner, 2020), complimented by a blend of synchronous and asynchronous learning methods (Ong et al., 2021; Spatioti et al., 2022).

Figure 3.22 illustrates the conclusion to Context Element 3: Short course.

Figure 3.22
Conclusion, Context Element 2 (Cycle 1)



Source: The researcher

Figure 3.22 presents the conclusion to Context Element 3: Short course for Chapter 3. The duration of short learning programmes, as reported in the literature, varies widely. The duration of a short course can vary from as little as one day (Alsaleh, 2020) to five days (Pereira et al., 2021), several weeks (Dziuban et al., 2018; Razak et al., 2020) or several months (Brouwer, Flerackers, et al., 2022). Regardless of the duration of a course, a course is effective when it leads to behavioural change (Brouwer, Flerackers, et al., 2022).

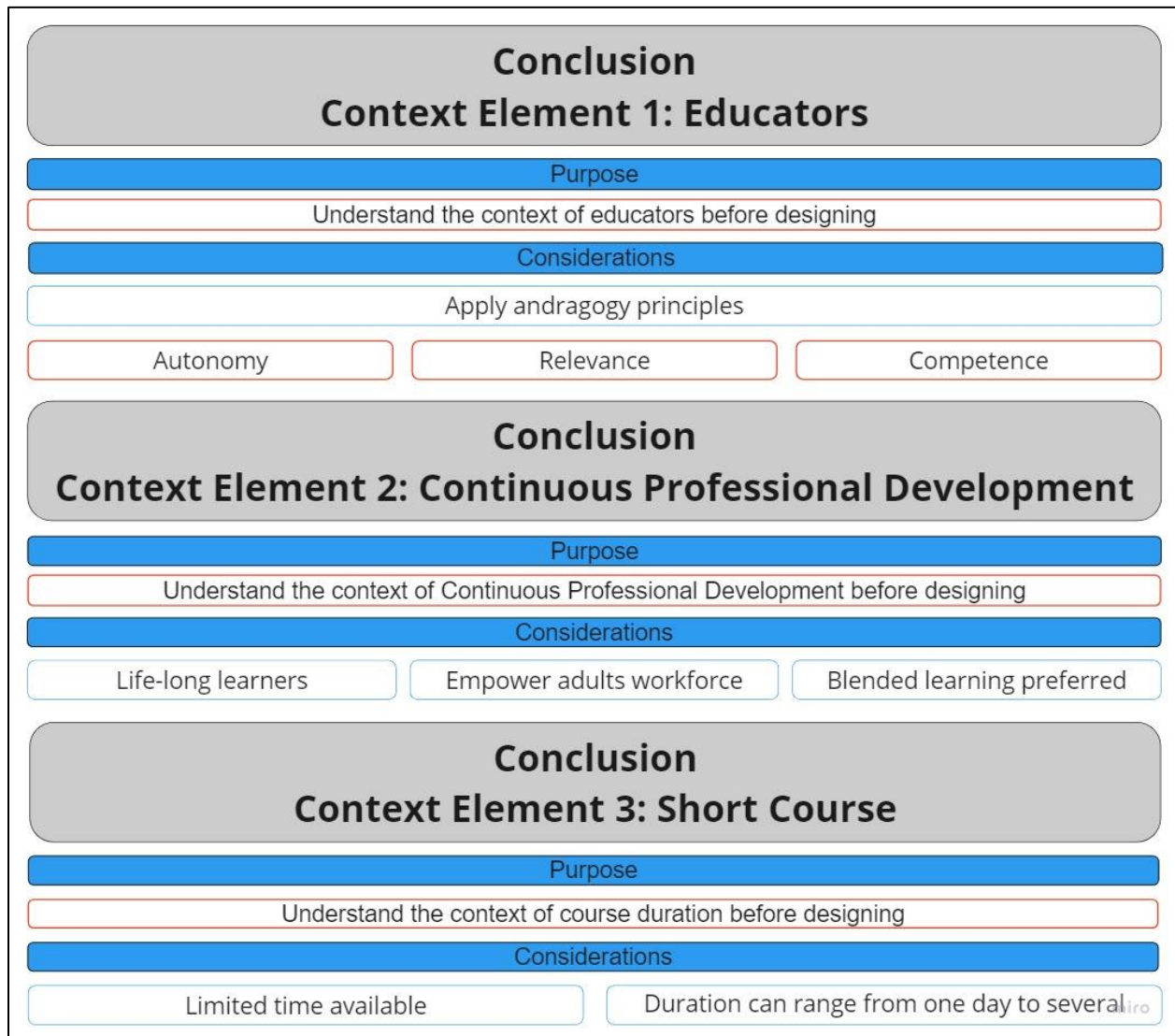
3.7.4 Conclusion to contextual factors

The researcher found the following considerations important when considering the context of educators who participate in CPD by means of a short course.

Educators have a need to participate in CPD, yet their time for CPD is very limited. To overcome these time limitations, the researcher finds that presenting CPD programmes that are contextually integrated in the lives of course participants is the most effective way of facilitating CPD. Use of blended learning, which includes synchronous and asynchronous elements, enables accessible and convenient micro-learning opportunities. The duration of a learning programme can vary depending on the required objectives and outcomes. It is, however, more effective to present a course as a series of short micro-engagements than as one long programme.

Figure 3.23 illustrates the conclusion to the purpose and considerations of Context Elements 1–3, Educators; CPD and Short course.

Figure 3. 23
Conclusion to research context (Cycle 1)



Source: The researcher

The context, namely (1) educators, partaking in (2) CPD in the form of (3) short courses, was discussed. The next two elements presented in the title of the study, namely design elements and blended learning programmes, are now discussed.

3.8 Design elements

This study aims to establish a set of considerations and elements for designers to draw on when designing blended learning programmes for educators who aim to participate in short, CPD programmes. Various considerations and elements emerge through the SLR. The researcher now discusses the design elements which emerged through the SLR. Each section includes a set of considerations and design elements associated with the design phase. The findings and results serve as a compilation of the considerations and elements.

3.8.1 Introduction to instructional design

ID is a systematic decision-making process which guides development of learning programmes (Raza et al., 2020; Suartama et al., 2019). ID refers to a systematic process used to develop educational programmes (Ghani & Daud, 2018; Suartama et al., 2019). ID aims to optimise learning processes to achieve learning goals (Klepsch & Seufert, 2020) while minimising the cognitive load for participants (Goodson & Nilson, 2017).

ID is also known as Instructional Systems Design (ISD), Instructional Systems Development (ISD), Systems Approach to Training (SAT) and Instructional Systems Approach (ISA), all essentially meaning the same thing and used interchangeably (Hodell, 2021).

ID has four main objectives: (1) identify instructional problems; (2) develop instructional plans to address the problems; (3) achieve set learning objectives; (4) ensure quality instruction which meets the needs of all stakeholders (Raza et al., 2020). Several ID models can be used to achieve these objectives. The researcher briefly discusses the most widely adopted ID models, followed by a thorough and applied discussion on the ADDIE Model of ID.

3.8.2 Introduction to ID Models

ID models form the backbone of the ID process and serve as a map which gives designers an overview of where they are going and how to get there (Cennamo & Kalk, 2019). ID is documentable, generally replicable, and increases predictable attainment of learning outcomes (Ghani & Daud, 2018). It enables designers to understand teaching and learning variables, which influence activity and evaluation design (Suartama et al., 2019).

Although ID models guide design, successful design depends on the skill of the instructional designer (Adnan & Ritzhaupt, 2018; Hodell, 2021). Every design project is different, and no single model will fit all scenarios and considerations in a checklist-like manner (Cennamo & Kalk, 2019; Hodell, 2021). Consequently, various ID models exist and can be used when designing a course

(Hodell, 2021). Prominent models include the Rapid Prototyping Model, Kemp, Dick and Carey, ASSURE, SAM, and the ADDIE Model (Ghani & Daud, 2018; Hodell, 2021).

Though many ID models exist, the majority of the models are based on the acronym represented by the ADDIE Model, namely Analysis, Design, Development, Implementation, and Evaluation (Cennamo & Kalk, 2019; Hodell, 2021). An in-depth discussion on the ADDIE Model of ID follows.

3.8.3 The ADDIE Model of Instructional Design

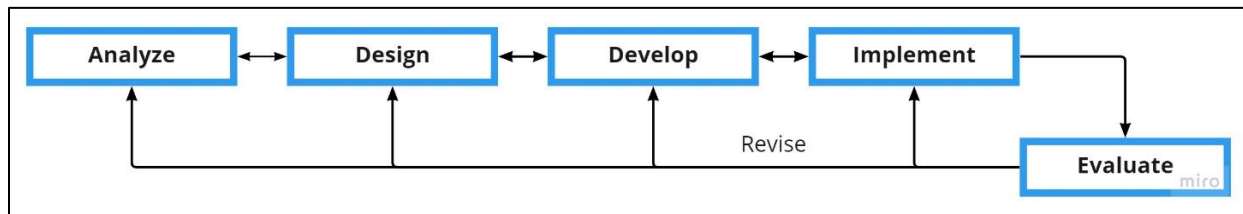
Implementation of an ID model emerges as the first element of blended learning programme design. The ADDIE Model of ID is chosen for in-depth review to build on the scoping review by Hodell (2021). The ADDIE Model integrates well with the Easterday et al. (2014) DBR process. A discussion on each phase of the ADDIE Model of ID follows, as part of the DBR Conceive phase.

The ADDIE process is a widely used ID process (Adnan & Ritzhaupt, 2018; Ghani & Daud, 2018; Molenda, 2015; Sözcü et al., 2013). ADDIE is an acronym for the five iterative stages of the ID process, namely: analyse, design, develop, implement, and evaluate (Branch, 2014; Hodell, 2021; Larson & Lockee, 2014; Molenda, 2015; Piskurich, 2015). The wide adoption of the ADDIE Model is due to its simple design (Spatioti et al., 2022) and its orientation toward solution of real-world problems in real-world contexts (Molenda, 2015). The ADDIE Model of ID is ideal for guiding CPD programme design (Alsaleh, 2020; Ong et al., 2021).

Traditionally, the ADDIE Model was portrayed as a linear process (Branch, 2014; Molenda, 2015); however, today designers embrace the complexity and change brought about by the influence of internet communication and technology when using the ADDIE Model (Adnan & Ritzhaupt, 2018; Ghani & Daud, 2018; Spatioti et al., 2022). Modern instructional designers continuously refine their understanding of learners, outcomes, assessments, activities and evaluation throughout the design process (Cennamo & Kalk, 2019).

Figure 3.24 illustrates the iterative, reflective and nature of the ADDIE Model, which is required when applied in a 21st century, blended learning environment. Though the ADDIE Model is sequential in its original form, each phase of the process impacts decisions around former and later phases of the process.

Figure 3.24
ADDIE Process of Instructional Design



Source: The researcher

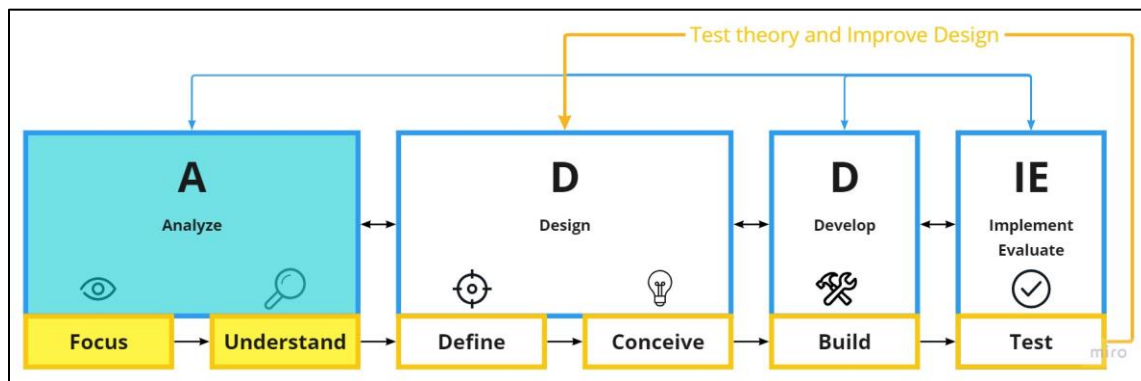
The researcher discusses Phase 1 to 5 of the ADDIE Model of ID, starting with Analysis, and ending with Evaluation. The researcher performed an SLR on each phase of the ADDIE Model through the lens of the title of the study: Elements of blended CPD short course design for educators.

3.8.3.1 ADDIE Analysis Phase

In this section, the researcher establishes the elements of ADDIE Analysis through the lens of the title of the study: ‘Elements of blended continuous professional development short course design for educators’. The researcher combines the ADDIE ID Model with the Easterday et al. (2014) DBR process to keep true the DBR research approach. During the DBR Focus and Understand phase, the designer specifies the audience, problem, and constraints of the programme. Analysis is used to understand the context of the participants and course environment through data collection and analysis.

Figure 3.25 illustrates where ADDIE Analysis is situated in the ADDIE Model of ID, and how it correlates with the phase of DBR, as described by Easterday et al. (2014).

Figure 3.25
ADDIE Analysis in DBR Phase

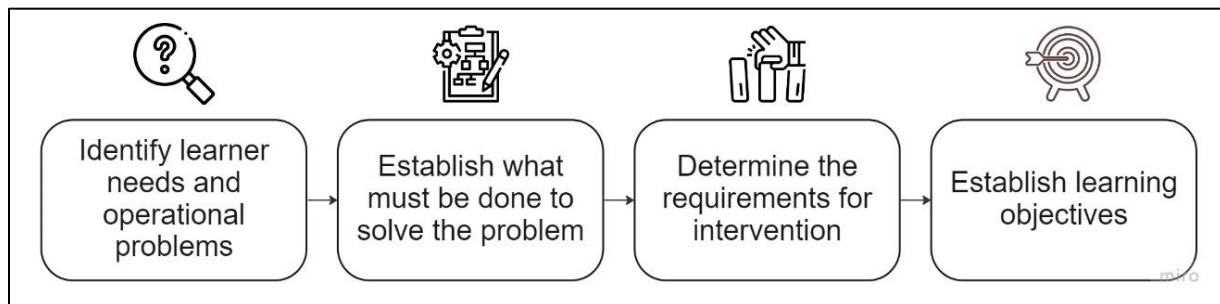


Source: The researcher

Analysis makes up the first phase of the ADDIE process and is the most important activity in ID (Alodwan & Almosa, 2018; Hodell, 2021; Zhang, 2020). Analysis is a systematic method of gathering information (Mahardhika et al., 2023) about a variety of contextual factors that influence course design decisions (Stapa & Mohammad, 2019). Information is gathered about the population, participants, subject matter, learner expectations, methods, budget, and delivery system (Hamzah et al., 2022; Hodell, 2021; Patel et al., 2018).

Analysis provides the data required to determine the needs and goals of the population, as well as how the needs will be met through a learning programme (Hodell, 2021; Jonnalagadda et al., 2022; Patel et al., 2018; Shakeel et al., 2022). Performance gaps, i.e., discrepancies between true employee performance and stipulated performance, serve as an indicator that there is a training need (Jonnalagadda et al., 2022). Figure 3.26 illustrates the four objectives of ADDIE Analysis.

Figure 3.26
Objectives of ADDIE Analysis



Source: The researcher

The ADDIE Analysis phase is used to identify learning needs and establish learning objectives (Adnan & Ritzhaupt, 2018; Alodwan & Almosa, 2018; Ghani & Daud, 2018; Patel et al., 2018). The ADDIE Analysis phase informs Design, Development, Implementation and Evaluation (Hodell, 2021; Raza et al., 2020; Shakeel et al., 2022; Zhang, 2020). In the following section, the researcher synthesises elements and considerations of ADDIE Analysis, based on the findings of the SLR.

A) Considerations ADDIE Analysis.

The purpose of analysis is to gather information before course design commences (Hodell, 2021; Raza et al., 2020; Zhang, 2020). In this section, the researcher discusses three considerations of ADDIE Analysis, including the five W's of analysis, variables in analysis, and considering deep analysis.

Consideration 1: Five W's. Course designers should consider five areas of analysis, namely: Who, What, Where, When and Why (Hodell, 2021). Table 3.5 outlines the five W's as considerations of ADDIE Analysis, with a brief description of each.

Table 3.5
Five W's of ADDIE Analysis

Analysis phase W's	Description and variables
Who	<i>Who</i> (individuals or groups) is involved in the learning programme and design process?
What	<i>What</i> is the main problem and can the problem be solved through a training programme? (Cotter et al., 2023) <i>What</i> skills and knowledge must be mastered through participation in the programme? <i>What</i> is the budget for the training programme, <i>what</i> must participants do to illustrate mastery of skills and knowledge or <i>what</i> must participants do to master the skills and knowledge they are taught?
Where	<i>Where</i> will the training be designed, implemented, and evaluated?
When	<i>When</i> will the course commence, be implemented, and be completed?
Why	<i>Why</i> is training required? (Cotter et al., 2023) <i>Why</i> should the course be implemented, and <i>why</i> is a course the best solution for the problem?

Source: The researcher

The five W's to consider during ADDIE Analysis are presented in Table 3.5. The researcher now moves on to Consideration 2, Analysis of variables.

Consideration 2: Analysis of variables. The Five W's of ADDIE Analysis help the designer to identify and focus on the main variables in a learning programme. Variables will differ for every project (Hodell, 2021), but the main variables in a learning programme are the available resources (Alodwan & Almosa, 2018); the intended beneficiaries of a programme; and the limitations of the project (Alodwan & Almosa, 2018; Hodell, 2021).

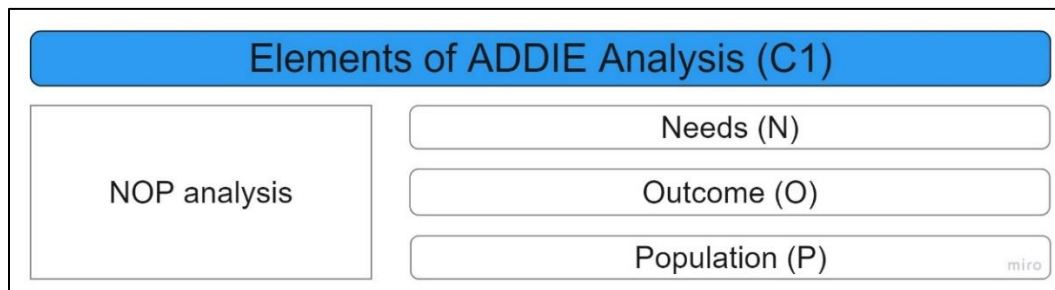
In the following section, the researcher addresses the Elements of ADDIE Analysis, followed by the conclusion to the considerations and elements of ADDIE Analysis.

B) Elements of ADDIE Analysis.

In the previous section, the researcher addressed the considerations of ADDIE Analysis. In this section, the researcher addresses three elements of ADDIE Analysis, namely an NOP Analysis, Further Analysis, and a Project Proposal. Elements of ADDIE Analysis are factors essential to making informed design decisions before Design commences.

Element 1: NOP Analysis. An NOP Analysis emerges as an element of ADDIE Analysis. NOP Analysis suggests that analysis should take place on three levels, namely (1) Needs; (2) Outcomes; and (3) Population (Hodell, 2021; Salas et al., 2020). Figure 3.27 illustrates the three sub-elements of Analysis Element 1: NOP Analysis.

Figure 3.27
Elements of ADDIE Analysis (Cycle 1)



Source: The researcher

Through NOP Analysis, three elemental avenues of Analysis are performed. The researcher describes the individual elements of an NOP analysis in Table 3.6.

Table 3.6
 NOP Analysis

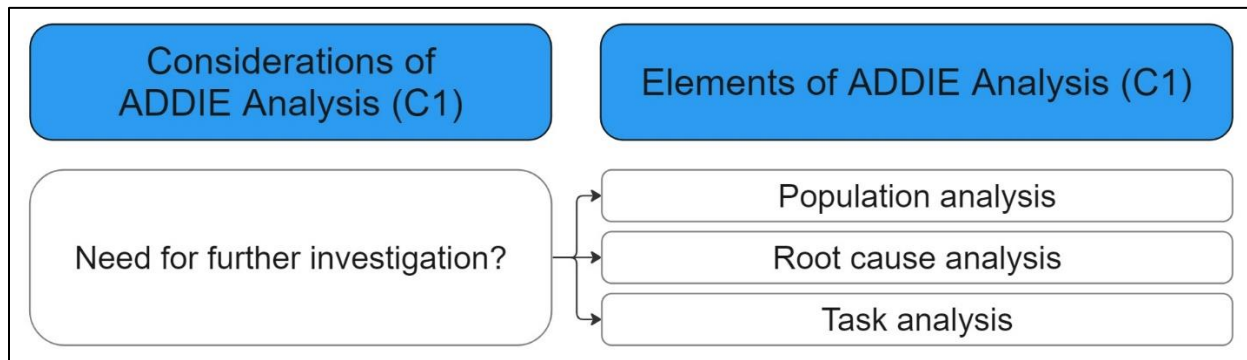
NOP element	Description
Need (N)	The need (N) defines why an intervention is required (Hodell, 2021). Needs analysis include both the participant's- and the institution's needs (Iswati, 2019). Need can include anything from a legal knowledge or skill requirement to a perceived lack of skill, knowledge, or productivity, but can include anything which can be addressed through a structured learning programme (Hodell, 2021). Interviews (Mahardhika et al., 2023), and review of curriculum, coursework and learning outcomes are effective methods of identifying needs and shortfalls (Iswati, 2019). Designers can also draw on the experience and expertise of subject matter experts (SME's) to establish course content and design (Chaudhuri & Chacko, 2021).
Outcome (O)	Outcome (O) defines what the organisation wants to accomplish (Hodell, 2021). Outcomes refer to organisational goals, learner goals and methods of evaluation (Hodell, 2021).
Population (P)	Population (P) analysis is analysis of the demographic, culture, roles and characteristics of the organisation and participants (Cennamo & Kalk, 2019; Cotter et al., 2023; Hodell, 2021). Population analysis is concerned with participants' age, education level, technological competence, attitudes, needs, disabilities, and challenges (Hodell, 2021). Population analysis includes participant and facilitator needs analysis (Zhang, 2020).

Source: The researcher

Thorough analysis of Needs, Outcomes and Population should precede development of learning materials (Hodell, 2021; Iswati, 2019). Designers do not have to have an answer to all conceivable questions to move on to the ADDIE Design phase (Hodell, 2021). If, however, too much conflicting data arises from analysis, the designer might experience analysis paralysis, prohibiting him/her from moving to the design phase of the ADDIE Model (Hodell, 2021). In such cases, a researcher can consider further analysis.

Element 2: Further analysis. At times, further analysis is required, even after addressing the considerations and elements of ADDIE Analysis discussed (Hodell, 2021). Figure 3.28 illustrates these three elements of further analysis.

Figure 3.28
Elements of further analysis



Source: The researcher

Three forms of further analysis emerged, namely (1) Population analysis (Hodell, 2021; Maddock & Maroun, 2018; Raza et al., 2020; Widyastuti & Susiana, 2019); (2) Root cause analysis (Hodell, 2021; Stapa & Mohammad, 2019) and (3) Task analysis (Hodell, 2021).

Table 3.7 summarises the elements of further analysis, including population analysis, root cause analysis, and task analysis.

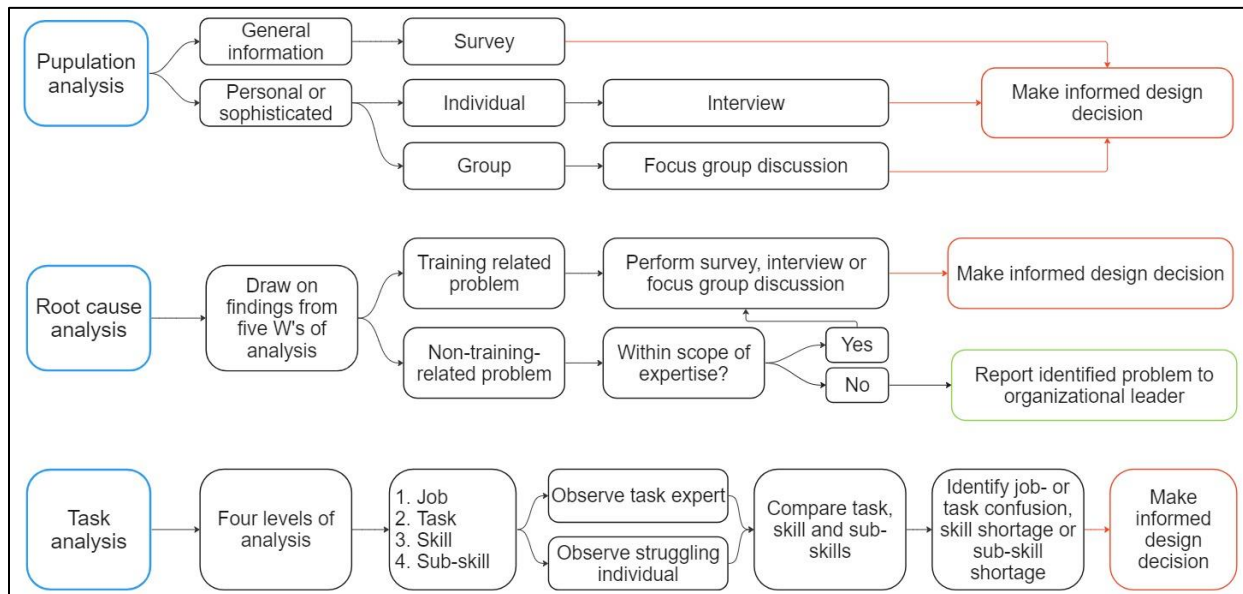
Table 3.7
Elements of further analysis

Deep analysis type	Description
Population analysis	Analyse individual perspectives (Maddock & Maroun, 2018), and participants' relationship to the course (Hodell, 2021) to personalise a course to participants' needs (Maddock & Maroun, 2018). Include analysis of demographics, prior knowledge, language competency, learning styles and cultural norms, skill level, motivation, course expectations and attitude toward learning (Hodell, 2021; Raza et al., 2020; Widyastuti & Susiana, 2019). Large population data can be collected through a survey or observation (Mahardhika et al., 2023) while sophisticated and personal data can be obtained through focus group discussions or interviews (Arisanti et al., 2019; Hodell, 2021; Mahardhika et al., 2023).
Root cause analysis	Identify the root cause of the problem (Hodell, 2021; Stapa & Mohammad, 2019) through surveys, focus group discussions and interviews (Hodell, 2021). At times, the root cause might not have an instructional solution (Hodell, 2021).
Task analysis	Analyse the competencies required to complete complex tasks to master and train other participants to perform the task (Hodell, 2021; Jonnalagadda et al., 2022; Klepsch & Seufert, 2020; Widyastuti & Susiana, 2019). Four levels of task analysis, including job-, task-, skill- and sub-skill analysis can be done (Cennamo & Kalk, 2019; Hodell, 2021). Analytical observation (Hodell, 2021) and analysis of behavior, conditions and standards (Jonnalagadda et al., 2022) can be used during task analysis.

Source: The researcher

Table 3.7 illustrates what designers can focus on when NOP analysis does not provide sufficient data to understand the problem and the designer is unable to proceed to design a solution. Sources of further analysis include the participating population, analysis to find the root cause of a problem, or analysis of the problematic task. Figure 3.29 illustrates a summarised further analysis mind map, based on Table 3.6.

Figure 3.29
Further analysis mind-map summary

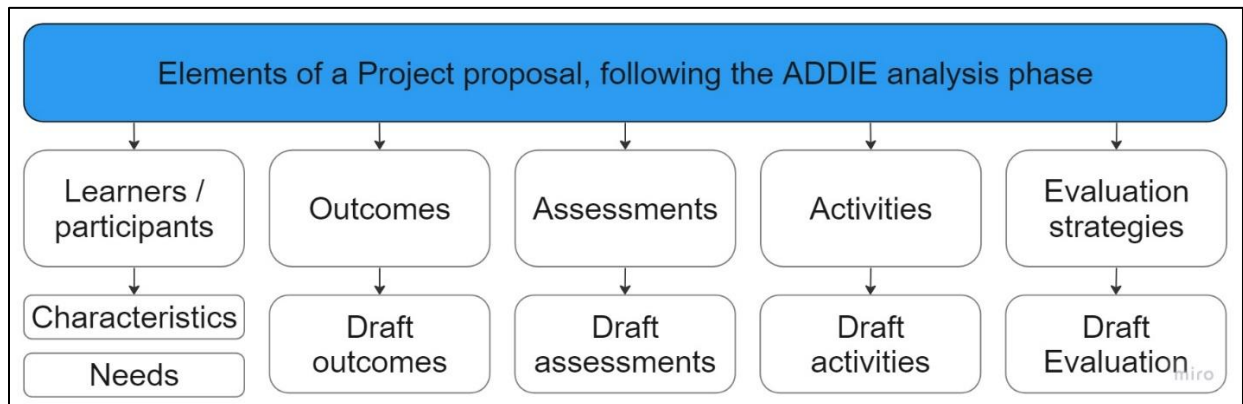


Source: The researcher

Figure 3.29 suggests a map of paths to follow when further analysis is required to understand a problem and make an informed decision to address the problem.

Element 3: Project proposal. The final element of ADDIE Analysis is a project proposal. A Project Proposal is developed to conclusion the analysis phase (Cennamo & Kalk, 2019). The Project Proposal should include the participants' characteristics and needs, the project outcomes, potential benchmarks for success (assessments), the product of learning (activities) and a strategy for determining the programme's effectiveness (evaluation) (Cennamo & Kalk, 2019; Hodell, 2021). Figure 3.30 illustrates the elements of a Project Proposal, following the ADDIE analysis phase.

Figure 3.30
Elements of ADDIE Analysis Project Proposal



Source: The researcher

The elements of a Project Proposal are presented in Figure 3.30. These elements should be included in a design brief, as described by the DBR Focus phase, earlier in Chapter 2.5. A design brief should provide a rough plan to address essential design factor, before design commences.

Evaluation during Analysis. Evaluation during analysis is an important part of the ADDIE process (Hodell, 2021). Evaluation during analysis ensures that all aspects of analysis were completed before commencing design (Hodell, 2021). ADDIE Evaluation is discussed in detail in the ADDIE Evaluation phase later in this chapter. A checklist for Evaluation during Analysis is attached as an appendix in Appendix A.

C) Conclusion: Elements and considerations of ADDIE Analysis

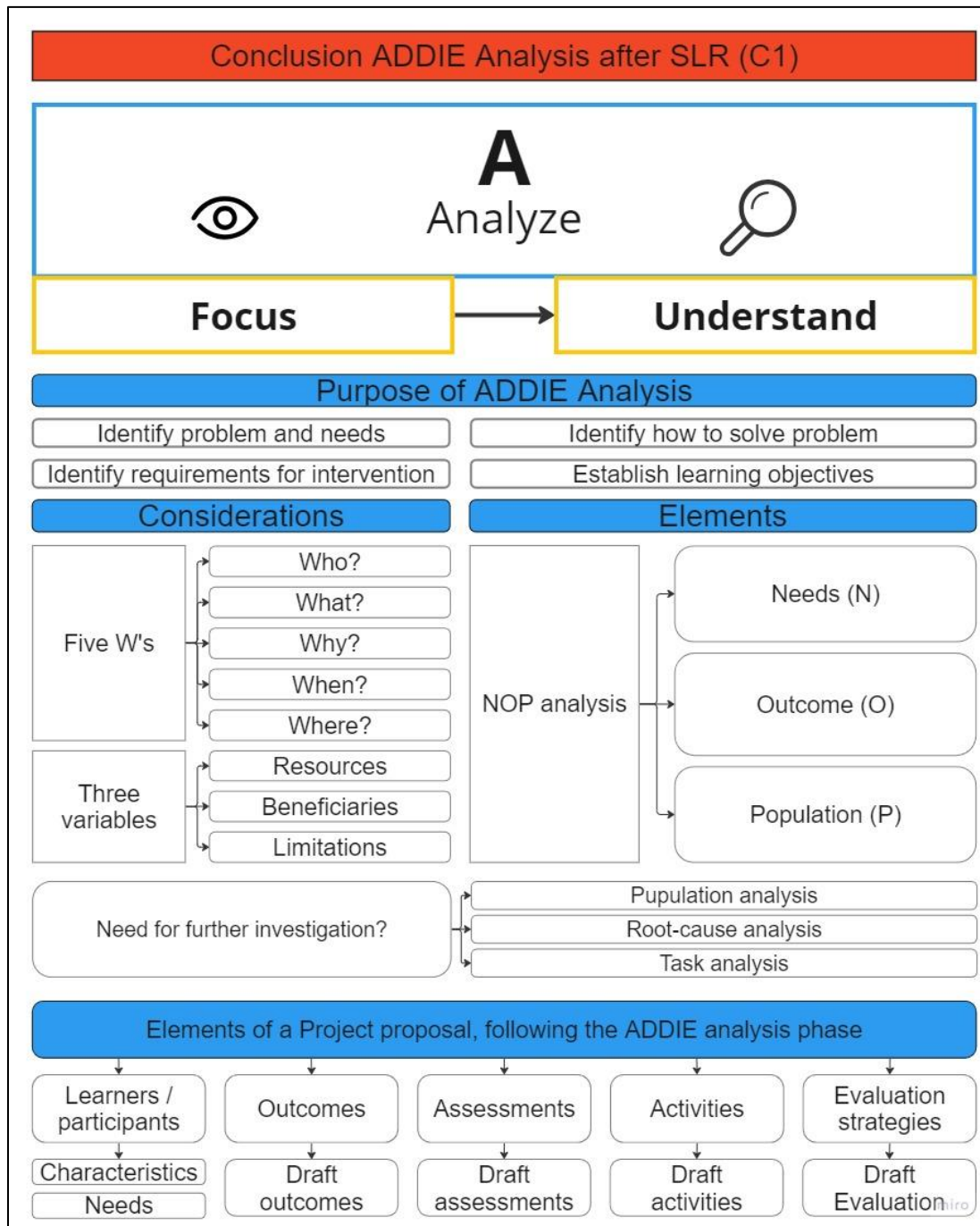
The literature unequivocally states that ADDIE Analysis is used to: (1) identify learner- and organisational needs and problems; (2) identify what must be done to solve the problem; (3) establish the requirements for intervention; and (4) establish learning objectives (Adnan & Ritzhaupt, 2018; Branch, 2014; Castro & Tumibay, 2021; Hodell, 2021; Larson & Lockee, 2014; Molenda, 2015; Naidoo et al., 2021; Piskurich, 2015; Zhang, 2020).

Upon completion of the Analysis phase, the instructional designer should be able to answer the following questions (Hodell, 2021):

- What is the problem or need to be addressed?
- What are the training- and non-training related problems?
- Are there sufficient data to prove the existence of a problem, as well as the cause of the problem?
- Do you have a clear understanding of the needs of the course participants?
- What is the population's attitude toward participation in the course?

The purpose, considerations, and elements of ADDIE Analysis, based on the findings of Cycle 1, SLR, are illustrated in Figure 3.31. The findings of the considerations and elements of the ADDIE Analysis phase should directly inform all latter phases of the ADDIE process (Hodell, 2021; Mahardhika et al., 2023; Naidoo et al., 2021; Zhang, 2020).

Figure 3. 31
Findings and results of ADDIE Analysis (Cycle 1)



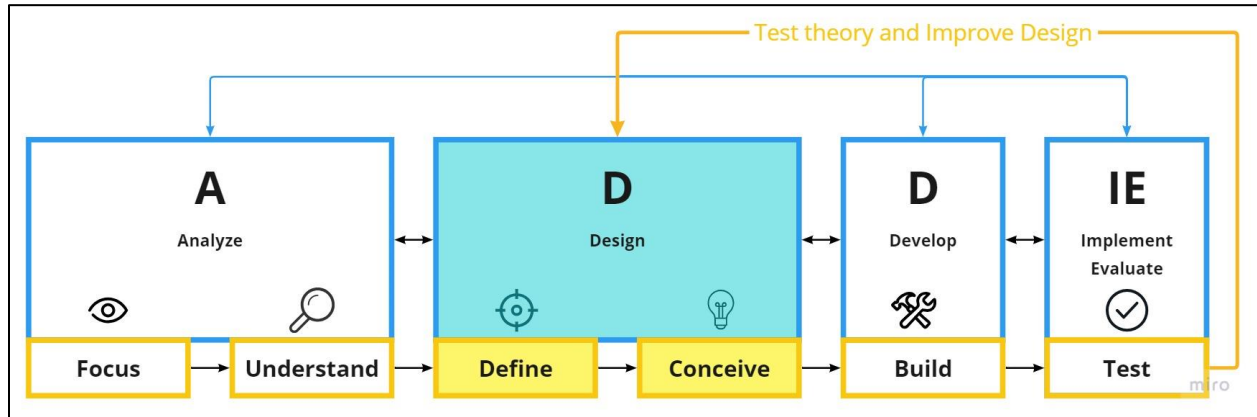
Source: The researcher

Figure 3.31 presents the purpose, considerations, and elements of ADDIE Analysis, based on the findings and results of Chapter 3, Cycle 1. This concludes the first phase of the ADDIE process. In the following section, the researcher will address the ADDIE, Design Phase.

3.8.3.2 ADDIE Design Phase

In this section, the researcher addresses the elements of Design (D) through the lens of the title of the study: Elements of blended CPD short course design for educators. Figure 3.32 illustrates where ADDIE Design is situated in the ADDIE Model of ID, and how it correlates with the phase of DBR as described by Easterday et al. (2014).

Figure 3.32
ADDIE Design and DBR Phase



Source: The researcher

The DBR Design phase draws on the Focus and Understand phases to make data-informed design decisions. During the DBR Conceive phase, the designer sketches a plan which could address the identified problem.

Each phase of the ADDIE process is important, but design is at the nucleus of the ADDIE process (Hodell, 2021). Design is the first step in the process of developing an intervention to address the identified problem(s) (Jonnalagadda et al., 2022; Piskurich, 2015; Zhang, 2020). Course design is the most influential factor in participants' motivation and opinion about a course (Kolcu et al., 2020). The design phase serves as a course blueprint (Naidoo et al., 2021; Patel et al., 2018) which ensures that thorough planning is done before development, implementation, and evaluation commences (Cennamo & Kalk, 2019).

A) Considerations of ADDIE Design

Four considerations of ADDIE Design emerged, namely: (1) apply modularity; (2) reuse design plans; (3) vary media types and lastly (4) design with a delivery system in mind.

Implementation is most effective when designers adhere to the principle of modularity (Sweller, 2016; Sweller et al., 2019). Students prefer small manageable modules to large, bulky content sections (Adnan & Ritzhaupt, 2018; Chaudhuri & Chacko, 2021; Raza et al., 2020). Addressing

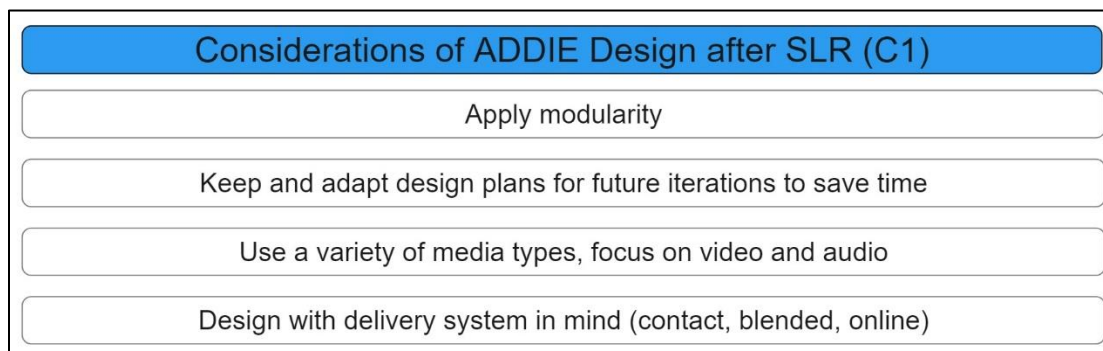
problems through modularity increases the availability of working memory and consequently the effectiveness of learning (Sweller, 2016). Designers can align each activity with a specific learning objective (Goodson & Nilson, 2017) so that students can learn to categorise problems and solutions (Sweller, 2016). Student should face increasingly difficult problems (Jalinus et al., 2021) through application of the principle of the zone of proximal development (Hodell, 2021; Jalinus et al., 2021).

Course designers can store and reuse design plans and lesson plans, and created modules (Adnan & Ritzhaupt, 2018; Hodell, 2021; Raza et al., 2020) to save time and spend more time on problem solving (Adnan & Ritzhaupt, 2018; Hodell, 2021), especially when teaching with technology (Hodell, 2021).

Designers can vary content and activity types to meet the needs of course participants (Chaudhuri & Chacko, 2021). Activities can vary between discussions, peer review, group work, interactive learning objects, self-assessment, reflections, flash cards, online quizzes, practice exams, and periodic progress reports on large projects (Goodson & Nilson, 2017).

Lastly, designers should consider the delivery system to be used when implementing the course (Dziuban et al., 2018; Hodell, 2021). Various delivery systems can be used, including F2F instruction; online learning; mobile learning; and blended learning (Dziuban et al., 2018; Hamzah et al., 2022; Hodell, 2021; Jalinus et al., 2021; Ratheeswari, 2018; Ridwan et al., 2020; Risdianto, 2018). Figure 3.33 illustrates the Considerations of ADDIE Analysis after Cycle 1.

Figure 3.33
Considerations of ADDIE Analysis (Cycle 1)



Source: The researcher

Figure 3.33 presents the four considerations of ADDIE Design that emerged in C1. In the following section, the researcher addresses the Elements of ADDIE Design, followed by the conclusion to the considerations and elements of ADDIE Design.

B) Elements of ADDIE Design

Two elements, namely, a design plan and a lesson plan, emerge as prominent course design elements (Hodell, 2021; Razak et al., 2020). A design plan and lesson plan are the two single most important deliverable elements of the design phase (Hodell, 2021) and are essential to the teaching and learning process (Raza et al., 2020).

Element 1 of ADDIE Design (Design Plan). A design plan is the main element of the ADDIE Design Phase (Hodell, 2021). A design plan is a document which describes seven design sub-elements of course design (Hodell, 2021). These elements include a course rationale; population profile; a course description; learning objectives; determining an evaluation strategy, tasks and instruments; preparing a suitable delivery system; learner- and facilitator prerequisites; and collecting, preparing and structuring course content, referred to as deliverables (Branch, 2014; Hodell, 2021; Jonnalagadda et al., 2022; Piskurich, 2015).

A design plan can serve as an adaptable model for future design projects and save hours of analysis and design work (Hodell, 2021). Table 3.7 discusses each of the seven sub-elements of the ADDIE Design, Design Plan.

Table 3.8
Sub-elements: ADDIE Design Plan

Design Plan Sub-Element	Description
Course rationale	The rationale serves as the course's mission statement and makes a case for implementation of the project (Hodell, 2021). The rationale should state the need for the course, who the course serves, what makes the course unique and the benefits of participation (Hodell, 2021).
Population profile	A detailed description of the target population group, including position, age, qualification level, language, reading level, motivation, and aspects that can cause design problems (Hodell, 2021).
Course description	Describe the training structure, including course- and module duration, instructional method, and materials (Hodell, 2021). Include a description of the facilities and technical requirements such as Wi-Fi and hardware requirements (Hodell, 2021).
Learning objectives	Learning and behavioural objectives (Jonnalagadda et al., 2022; Razak et al., 2020) form the foundation of course action (Hodell, 2021; Razak et al., 2020). It sets a clear purpose, avoids confusion (Raza et al., 2020) and encourages application of knowledge to address real world problems (Goodson & Nilson, 2017; Jonnalagadda et al., 2022; Sayiner & Ergönül, 2021). Learning objectives should focus on getting student to apply content knowledge, rather than to cover content (Goodson & Nilson, 2017). Setting learning outcomes in the context of real-world problems increases participation and course completion rates (Goodson & Nilson, 2017; Hodell, 2021).

Evaluation strategy	An evaluation strategy describes how learner mastery of learning objectives will be evaluated and how the course design will complement the learning process (Hodell, 2021). Evaluation includes course design evaluation (Hodell, 2021); evaluation for learning and evaluation of learning (Chaudhuri & Chacko, 2021; Hodell, 2021; Jonnalagadda et al., 2022; Razak et al., 2020).
Prerequisites	A course must specify a set of learner prerequisites and competencies, such as language ability, reading level, age or experience (Hodell, 2021). A course should also have a set of facilitator prerequisites, including the knowledge, skills and competencies facilitators require to facilitate the course and implement lesson plans (Hodell, 2021).
Deliverables	Deliverables refer to all physical (hard and soft copy) training materials which will be used in the course (Jonnalagadda et al., 2022). These can include the analysis report, design plan, lesson plans, teaching materials (text, audio, and visual files), and evaluation instruments (Hodell, 2021). The general scope and sequence of content is determined during the design phase (Cennamo & Kalk, 2019). Instructional designers need to carefully consider the role of the content they include in a course (Goodson & Nilson, 2017) and arrange resources accordingly (Zhang, 2020). Resources and teaching strategies should be selected and arranged according to learning objectives (Goodson & Nilson, 2017; Ridwan et al., 2020; Zhang, 2020).

Table 3.8 discusses how a design plan facilitates course design and development. The researcher now discusses the design of deliverables for development. Deliverables and delivery system play an important role in course participation (Hodell, 2021; Spatioti et al., 2022) and can include a variety of media types (Goodson & Nilson, 2017; Hodell, 2021). A brief discussion on media types follows.

Incorporating media types in deliverables. Media selection should align with the learning outcomes, instructional strategy, learner characteristics, and instructional setting (Adnan & Ritzhaupt, 2018). Various media and content types are available as teaching resources. Teaching resources include text, pictures, audio, video, PowerPoint or apps (Yao, 2021).

Students have shown significant interest in video lectures (Hamzah et al., 2022; Irawan et al., 2020; Kolcu et al., 2020), and often prefer video or audio learning material to text-based material (Goodson & Nilson, 2017). Use of video as a media type promotes student involvement and course completion (Hamzah et al., 2022). Designers should, however, be considerate when deciding how long videos should be. Students prefer short videos (six-to-twelve minutes) over long videos (Goodson & Nilson, 2017; Spatioti et al., 2022). Pairing video- and audio-based learning with checklists, or a set of questions to answer while viewing or listening, is an effective method of media differentiation (Goodson & Nilson, 2017).

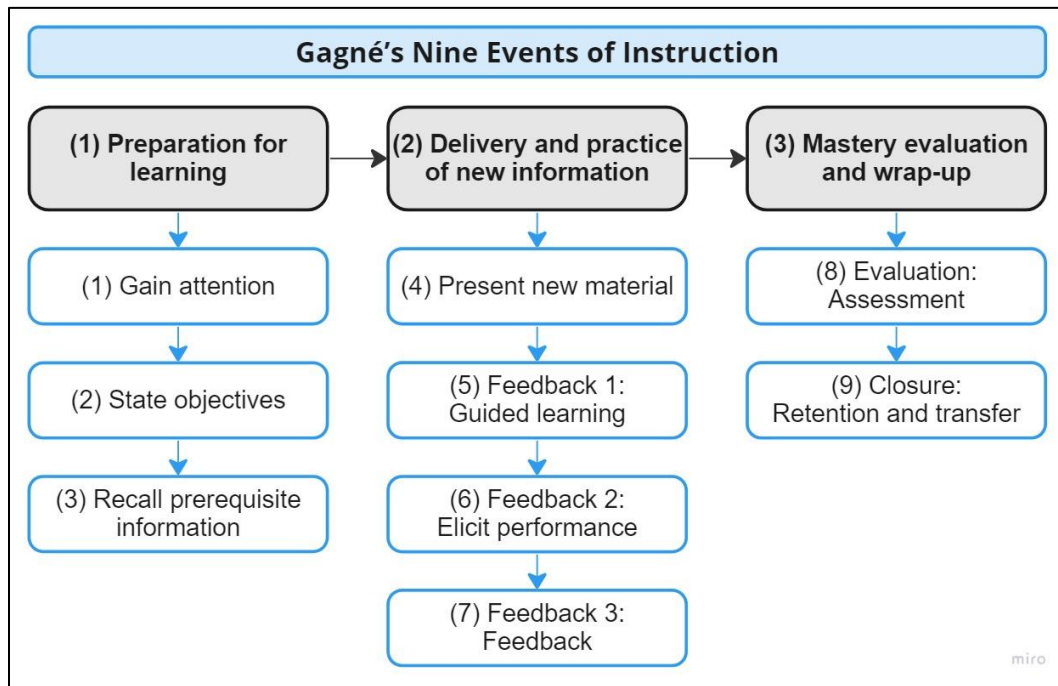
Selecting and preparing a delivery system. The designer should specify the tangible artefacts that will be delivered through the course, as well as the system used to deliver the artefacts (Hodell, 2021). Delivery systems include contact sessions, social media (Spatioti et al., 2022), or self-directed learning through an LMS (Hodell, 2021).

While a design plan outlines the key design features, facilitators will require a detailed guide to course facilitation, which Hodell (2021) describes as a lesson plan. A discussion on a lesson plan follows.

Element 2 of ADDIE Design (Lesson Plan). A lesson plan is a detailed facilitation guide which guides the action to be taken from the design plan's blueprint (Hodell, 2021). Lesson plans are also referred to as an instructor's guide, teaching guide or course plan (Hodell, 2021). Lesson plan design is a critical step in actively planning and structuring a learning experience, such that knowledge can be transferred from content input to long-term memory (Hodell, 2021). Lesson plans are equally important for contact and online learning programmes. The effectiveness of a blended learning course is dependent on proper implementation of a lesson plan (Purwani & Dewi, 2021).

Gagné's Nine Events of Instruction proposes nine fundamental aspects of teaching which could be included in a lesson plan (Chaudhuri & Chacko, 2021; Hodell, 2021; Raza et al., 2020). Figure 3.34 illustrates Gagné's Nine Events of Instruction.

Figure 3.34
Gagné's Nine Events of Instruction



Source: The researcher

Gagné's Nine Events of Instruction are categorised into three phases, namely: (1) Preparation for learning; (2) Delivery and practice of new information; (3) Mastery evaluation and wrap-up. The nine events of instruction are: (1) Gain attention; (2) State objectives; (3) Recall prerequisite information; (4) Present new material; (5) Feedback 1: Guided learning; (6) Feedback 2: Elicit performance; (7) Feedback 3: Feedback; (8) Evaluation and (9) Closure (Chaudhuri & Chacko, 2021; Hodell, 2021; Raza et al., 2020). A discussion on each of the nine events of instruction follows.

Event group 1: Preparation for learning. Preparation for learning is done through three events, namely: gain attention; state objectives; and finally recall prerequisite information. The goal of the preparation phase is to identify prior knowledge levels, provide a course roadmap and activate prior knowledge (Hodell, 2021).

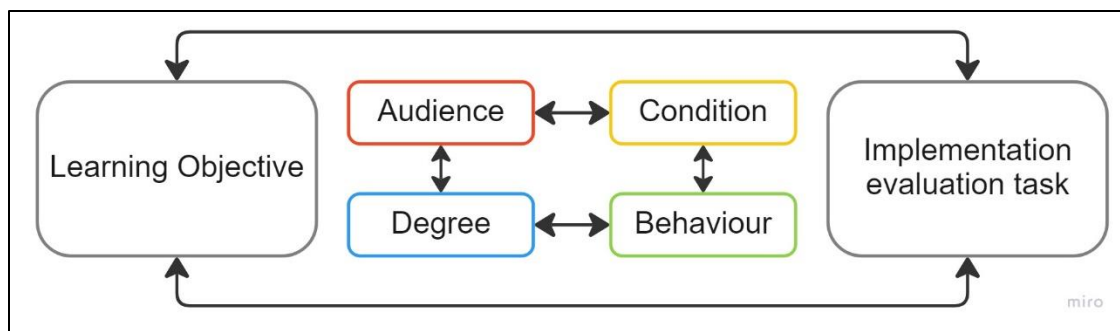
The design phase should be used to plan and design how the designer and facilitator will gain attention, how objectives will be formulated and how prerequisite knowledge will be recalled. Hodell (2021) suggests use of a short video or story to gain attention; application of the ABCD principle of setting objectives and using discussions or handouts to recall prerequisite information.

A discussion on the ‘preparation for learning’ phase follows later in the ADDIE Implementation Phase.

The discussion focuses on the process of developing strong behavioural objectives, since the designers should set learning objectives prior to course implementation as part of the ADDIE Design Phase.

Developing strong behavioural objectives. Learning objectives and the evaluation task must clearly stipulate four specifiers, namely, Audience, Behaviour, Condition, and Degree (the ABCD’s) (Hodell, 2021). Each objective must specify who (the audience) should perform the task; the desired behaviour; the conditions under which a certain behaviour is required; and the degree to which the skill or knowledge must be illustrated (Hodell, 2021). Figure 3.35 illustrates the connection between the learning objective and evaluation task through the four elements: Audience, Condition, Behaviour, and Degree.

Figure 3.35
Connecting learning objectives to evaluation.



Source: The researcher

Figure 3.35 illustrates the relationship between learning objectives and task implementation and evaluation. Each learning objective should specify the ABCD’s and be paired with an evaluation task.

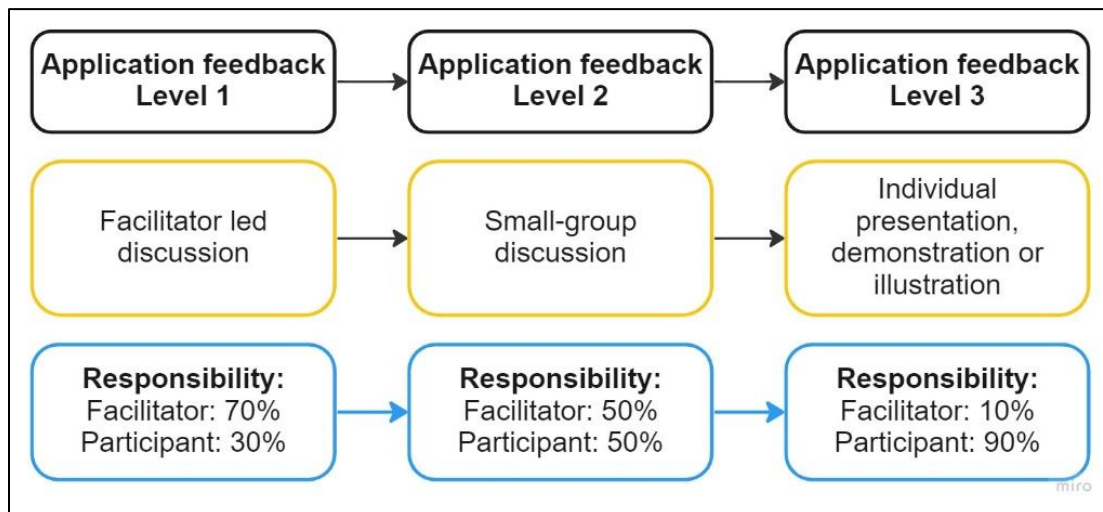
The researcher will now address Phase 2, Delivery and practice of new information, as per the Hodell (2021) Design Plan.

Event group 2: Delivery and practice of new information. Delivery and practice of new information is the phase in ADDIE where training activities are developed that will provoke facilitator feedback and lead to learner mastery (Hodell, 2021). Activities should be designed to facilitate novel solutions to problems, and then transfer new information from working memory to long-term memory (Sweller, 2016; Sweller et al., 2019). Designers should draw on the principles of cognitive load theory when designing content for delivery of new information (Klepsch &

Seufert, 2020). Participants cannot draw on long-term memory when confronted with new information (Sweller, 2016; Sweller et al., 2019). Learning takes place through generating theoretical solutions and testing procedure (Sweller, 2016).

There are four phases in delivery and practice of new information (Hodell, 2021), namely, content; application feedback level 1; application feedback level 2; and application feedback level 3 as presented in Figure 3.36.

Figure 3.36
Application feedback level 1 – 3



Source: The researcher

Figure 3.36 shows that each phase of content feedback facilitates a gradual transfer of responsibility from facilitator to participant through the levels of feedback (Hodell, 2021).

Content design is the most important aspect of design (Hodell, 2021). Content must align with the needs of the population, directly address the learning objectives, and draw the interest of the participants (Hodell, 2021). Content presentation and application feedback 1–3 is discussed in the section on the ADDIE Implementation phase.

The researcher continues to address Phase 3, Mastery evaluation and wrap-up, as per the Hodell (2021) Design Plan.

Event group 3: Mastery evaluation and wrap-up. Mastery of learning objectives, as well as evaluation of course design, must be done during the evaluation and wrap-up phase (Hodell, 2021). The instructional designer should review and redesign the course based on feedback received through multiple design cycles (Goodson & Nilson, 2017). The instructional designer should ask participants to reflect on subjective complexity and aim to remove excessive cognitive

load in future cycles (Goodson & Nilson, 2017; Klepsch & Seufert, 2020). Instructional Designers should ask participants whether learning material design (including types and methods of media use) helped participants to learn and redesign material which failed to achieve this goal (Klepsch & Seufert, 2020). Lastly, the designer should remove or alter design elements that hindered investment of effort and increase design elements that increased investment of effort by participants (Klepsch & Seufert, 2020).

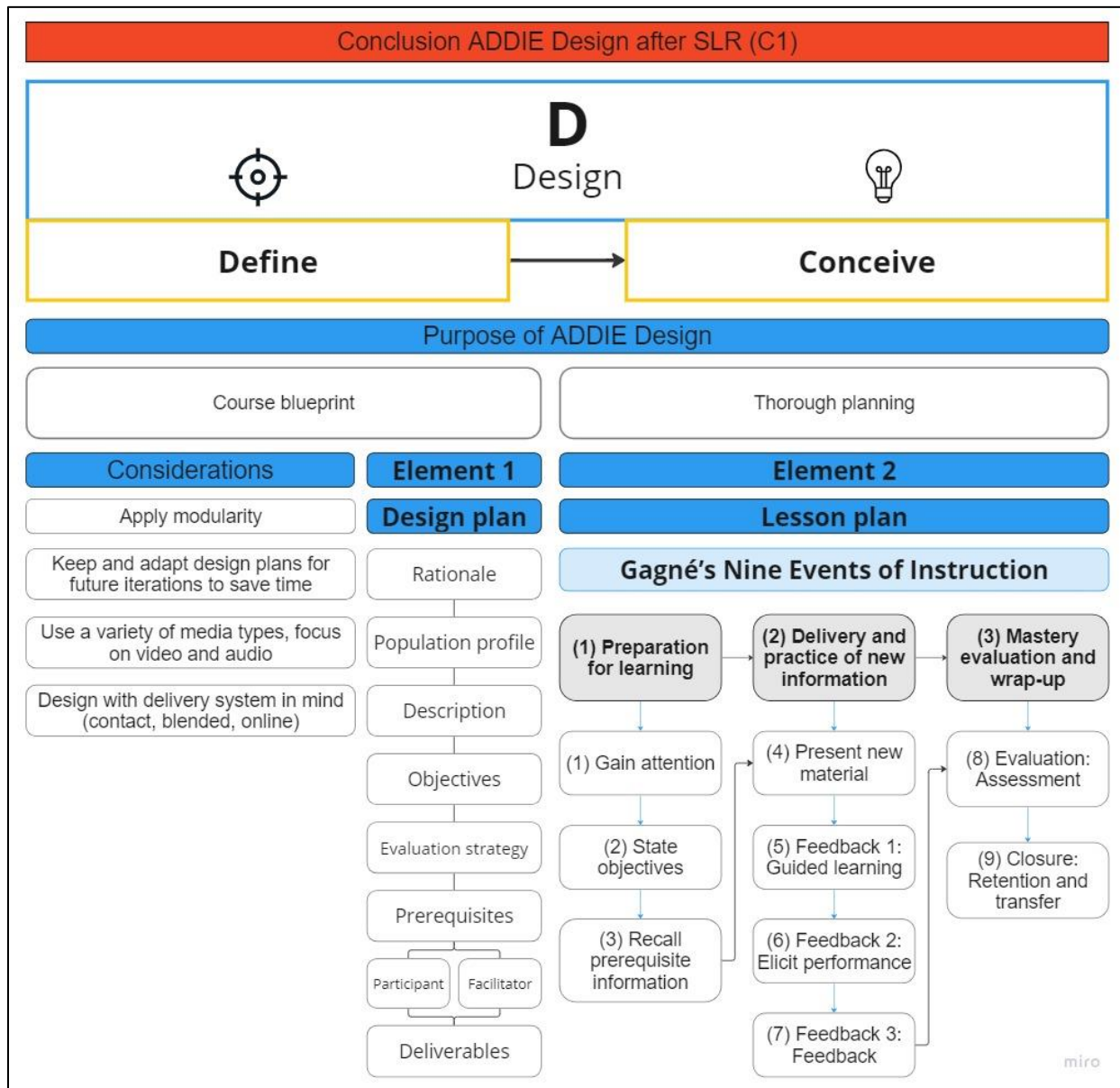
The purpose of learning is mastery; the ability to repeat knowledge or re-enact a skill (Hodell, 2021). Learners must demonstrate mastery of the skills and knowledge required by the learning objectives (Hodell, 2021). It is up to the designer to establish a suitable evaluation for assessment of learning objectives. Evaluation can be done through practical simulation; demonstration; in writing or verbally, and does not require a formal test (Hodell, 2021).

ADDIE Evaluation is discussed in detail in the ADDIE Evaluation phase later in this chapter. A checklist for Evaluation during Design is attached as an appendix in Appendix A.

C) Conclusion: Elements and considerations of ADDIE Design

Design is the process of planning for development, implementation, and evaluation with the purpose of designing a course implementation blueprint (Hodell, 2021). The main design elements are the design plan and lesson plan (Hodell, 2021). The design plan includes a rationale, population profile, course description, learning objectives, evaluation strategy, (participant and facilitator) prerequisites, and deliverables. The lesson is a more detailed plan for mastery of each learning objective. A lesson plan is a written plan which prepares participants for learning; guides delivery and facilitates practice of new information; evaluates mastery and wraps up each lesson or learning unit. Gagné's Nine Events of Instruction provides an excellent structure for writing a lesson plan (Chaudhuri & Chacko, 2021; Hodell, 2021). Figure 3.37 illustrates the finding and results for Cycle 1, SLR on ADDIE Design.

Figure 3.37
Conclusion to ADDIE Design (Cycle 1)



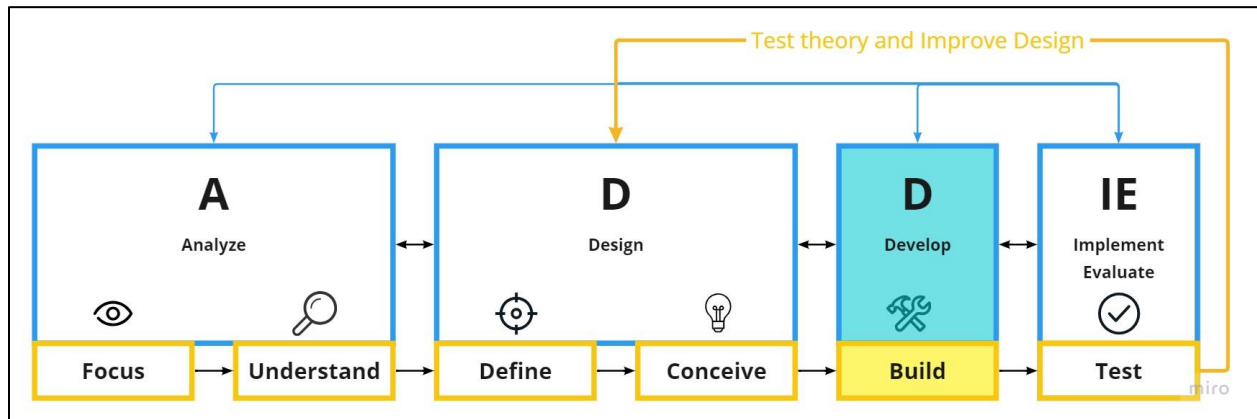
Source: The researcher

Figure 3.37 illustrates a summary of the purpose, considerations, and elements of ADDIE Design, as induced through Cycle 1, Chapter 3. The researcher has now concluded the second phase of the ADDIE process. In the following section, the researcher will address the ADDIE Development Phase.

3.8.3.3 ADDIE Development Phase

In this section, the researcher establishes the elements of Development (D) through the lens of the title of the study: Elements of blended continuous professional development short course design for educators. Figure 3.38 illustrates where ADDIE Development is situated in the ADDIE Model of ID, and how it correlates with the phase of DBR as described by Easterday et al. (2014).

Figure 3.38
ADDIE Development and DBR Build Phase



Source: The researcher

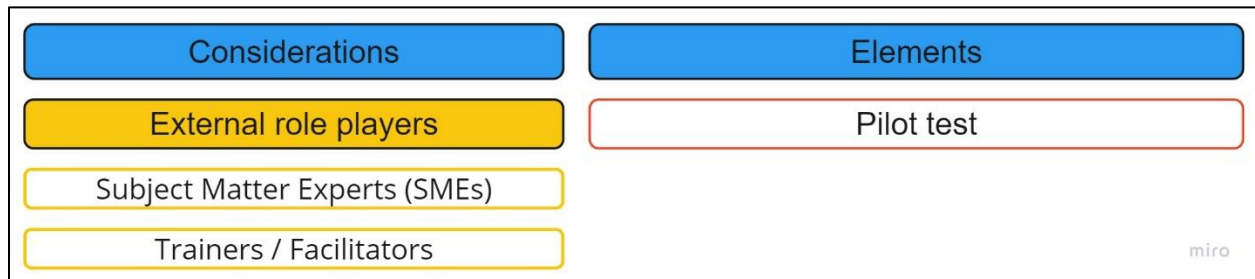
In the DBR Build phase, the designer uses information from the Analysis and Design phase to build a course. The course should address the problems and needs identified during the DBR Focus and Understand phases, materialise the Define and Conceive phases and build a learning programme through the ADDIE Development phase.

The development phase (D) is the execution of design (Adnan & Ritzhaupt, 2018; Hodell, 2021) and subsequent preparation of lessons for implementation (Hodell, 2021; Ridwan et al., 2020). During development, course content, training material, and supporting media are developed and organised (Jonnalagadda et al., 2022; Patel et al., 2018; Razak et al., 2020). The lesson plan, module, worksheets, supporting media, evaluation instruments and discussion forms must be prepared for each lesson (Ridwan et al., 2020). Each lesson must gain attention, facilitate recall, present content, and draw out learner feedback (Hodell, 2021).

One consideration and one element emerged from the SLR for the ADDIE Development phase. Inclusion of external role players in course development emerged as an ADDIE Development consideration. External role players include subject matter experts (SMEs) and facilitators. Performing a pilot test prior to course implementation emerged as an element of the ADDIE

Development phase. Figure 3.39 illustrates the considerations and elements of ADDIE Development.

Figure 3.39
Considerations and elements of ADDIE Development (Cycle 1)



Source: The researcher

Figure 3.39 illustrates the external role players as an ADDIE Development consideration, while the pilot test is elemental to ADDIE Development.

Following this, considerations of ADDIE Development are discussed, followed by the elements of ADDIE Development and a conclusion to ADDIE Development.

A) Considerations of ADDIE Development

Involvement of external role players emerged as a consideration of the ADDIE Development Phase. External role players can include SMEs or external facilitators. These two external role players are discussed.

ADDIE Development Consideration 1: SMEs. Instructional designers are not required to have all the knowledge to design and deliver a course by themselves (Hodell, 2021). Designers can draw on the expertise of SMEs throughout the ADDIE process (Arisanti et al., 2019; Chaudhuri & Chacko, 2021; Hodell, 2021). An SME is someone who is considered an expert in a specific field of expertise (Hodell, 2021).

SMEs can be categorised according to their role and expertise (Hodell, 2021). SMEs can be experts in various fields, including (1) technical; (2) functional; (3) sentinel; (4) instructional; or (5) hybrid. Each expert brings value to the design process from a unique perspective. Table 10, in Appendix A, outlines the five categories of SME's and their role in course development, as described by Hodell (2021).

The researcher continues the discussion on consideration of the second type of role player, namely External Facilitators.

ADDIE Development Consideration 2: External Facilitators. External role players can play an instrumental role in course development through train-the-trainer (TTT) programmes (Hodell, 2021). TTT programmes are intended for critical discussion of course content and can take twice as long to implement as the actual course implementation for the intended participants (Hodell, 2021). Course development is a continuous working project (Hodell, 2021). Development involves continuous evaluation, re-evaluation, pilot tests, SME feedback, and trainer feedback (Hodell, 2021).

In the following section, the researcher addresses the Elements of ADDIE Development, followed by the conclusion to the considerations and elements of ADDIE Development.

B) Elements of ADDIE Development

The first element of development is execution of a pilot test (Adnan & Ritzhaupt, 2018; Branch, 2014; Chaudhuri & Chacko, 2021; Hodell, 2021; Piskurich, 2015), also referred to as usability tests (Chaudhuri & Chacko, 2021; Hodell, 2021; Patel et al., 2018; Razak et al., 2020) or a rapid prototype (Razak et al., 2020; Shakeel et al., 2022). Despite the knowledge and experience of a SME or seasoned instructional designer, a usability test is a critical step in the development phase (Patel et al., 2018; Raza et al., 2020).

A pilot test is performed prior to implementation in a real learning environment (Adnan & Ritzhaupt, 2018; Hodell, 2021; Jonnalagadda et al., 2022). A pilot test should test design elements including course content, course structure, course duration and technical design inform design changes (Hodell, 2021; Jonnalagadda et al., 2022).

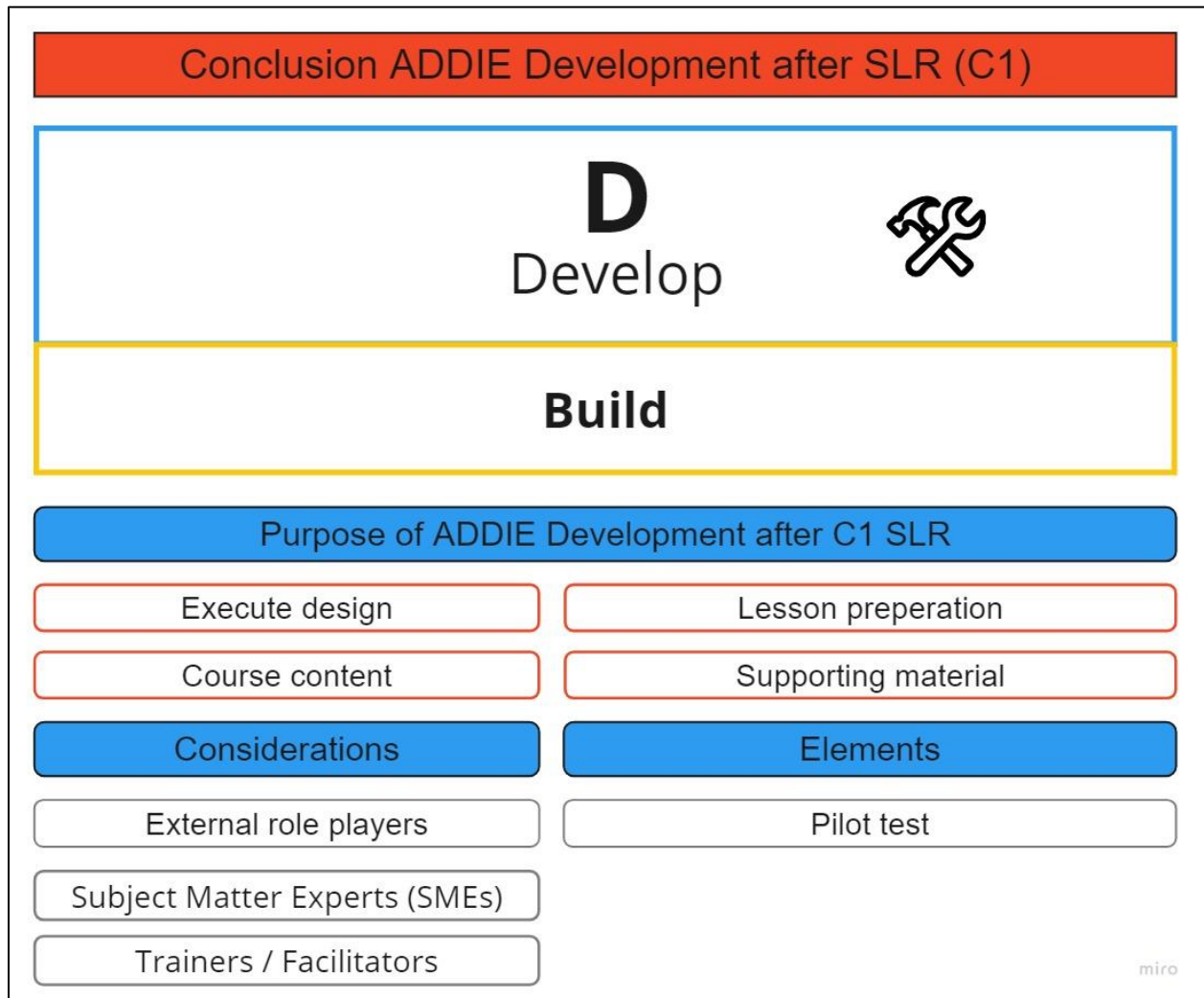
Pilot tests are especially important when designing a blended learning programme (Patel et al., 2018). A blended course should ensure that technical design elements are tested prior to implementation (Patel et al., 2018). It is essential to ensure that the LMS navigation pane-, media-, hyperlink-, and button functionality, as well as functionality across a variety of devices and web browsers, is done (Patel et al., 2018). Test results and feedback can be used to apply changes and improve functionality and user experience (Chaudhuri & Chacko, 2021; Jonnalagadda et al., 2022; Patel et al., 2018; Razak et al., 2020; Sood et al., 2020).

C) Conclusion: Elements and considerations of ADDIE Development

The researcher concludes that ADDIE Development is used to execute design, prepare lessons, and develop course content and supporting material. The researcher finds that a course designer can consider the use of external role players, including SMEs and external facilitators, while

performing a pilot test is elemental to the ADDIE Development Phase. Figure 3.40 illustrates the findings and results for Cycle 1, SLR on ADDIE Development.

Figure 3. 40
Conclusion to ADDIE Development (Cycle 1)



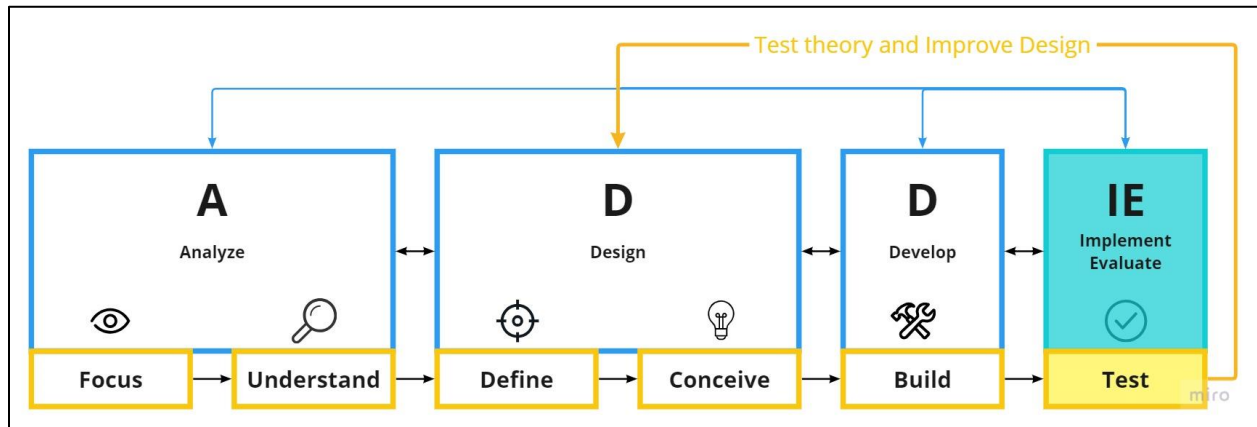
Source: The researcher

Figure 3.40 presents a summary of the purpose, considerations, and elements of ADDIE Development after Cycle 1, Chapter 3. The researcher has now concluded the third phase of the ADDIE process. In the following section, the researcher will address the ADDIE Implementation Phase.

3.8.3.4 ADDIE Implementation Phase

In this section, the researcher establishes the elements of Implementation (I) through the lens of the title of the study: Elements of blended continuous professional development short course design for educators. Figure 3.41 illustrates where ADDIE Implementation is situated in the ADDIE Model of ID, and how it correlates with the phase of DBR as described by Easterday et al. (2014).

Figure 3.41
ADDIE Implementation and DBR Test Phase



Source: The researcher

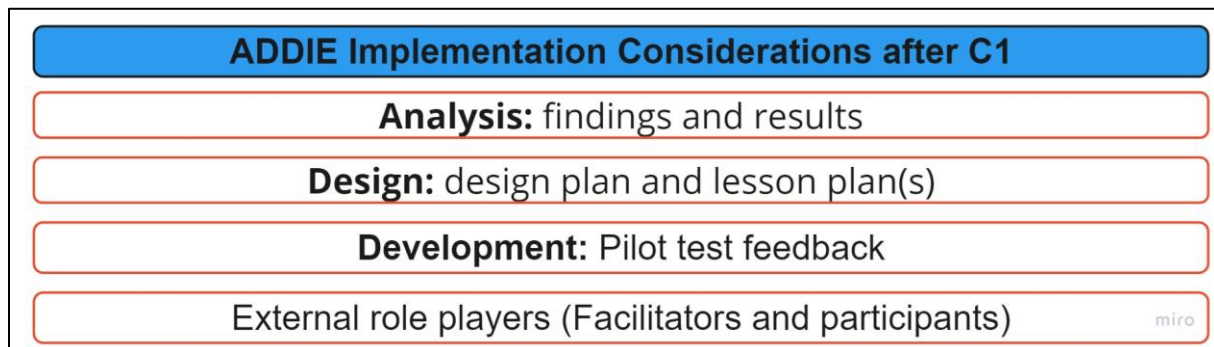
Figure 3.41 illustrates that the effectiveness of the developed course should be tested in a real-world learning environment. The test is performed in the form of ADDIE Implementation and Evaluation.

Implementation is the culmination of the work done during the Analysis, Design, and Development phase of the ADDIE Model of ID (Hodell, 2021). The implementation phase (I) is the active implementation of the designed and developed teaching and learning material in a real learning environment (Adnan & Ritzhaupt, 2018; Hodell, 2021; Jonnalagadda et al., 2022). Materials are moved from the draft phase to the final product (Hodell, 2021). During implementation, learners master the skills and knowledge required to address the problem that was identified through the analysis phase (Branch, 2014). Students actively engage in learning (Hodell, 2021; Piskurich, 2015; Razak et al., 2020) and knowledge transfer (Zhang, 2020), while facilitators provide feedback and perform formative evaluation of learning (Chaudhuri & Chacko, 2021; Hodell, 2021).

A) Considerations of ADDIE Implementation

Four considerations emerged for the ADDIE Implementation phase. The designer can consider the (1) feedback obtained through ADDIE Analysis; (2) design plan and lesson plans developed in the ADDIE Design phase; (3) feedback received from the Development phase pilot test; and lastly (4) the external role players, including facilitators and participants. The four considerations of ADDIE Implementation are presented in Figure 3.42.

Figure 3.42
Considerations of ADDIE Implementation (Cycle 1)



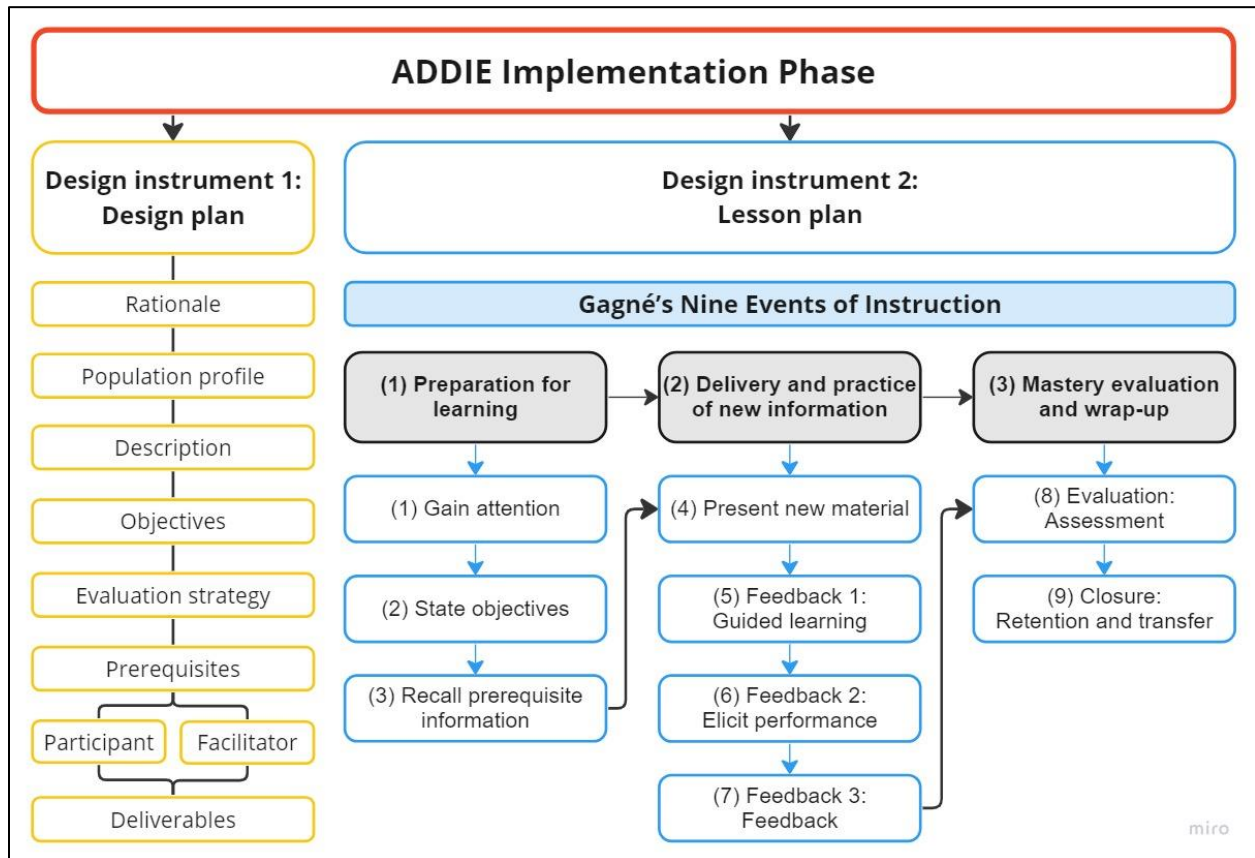
Source: The researcher

Figure 3.42 illustrates that designers should remain considerate of the findings of the Analysis, Design and Development phases when implementing a course. Course implementation can be done by course designers, external facilitators, SMEs or a combination of these (Hodell, 2021). The facilitator must be familiar with the process that ensued prior to implementation and can never have too much information for implementation (Hodell, 2021).

B) Elements of ADDIE Implementation

Gagné’s Nine Events of Instruction, also discussed in the ADDIE Design phase, emerged as an element of ADDIE Implementation. Hodell (2021) suggests implementation through two elements, namely a Design Plan and Lesson Plan. Figure 3.43 illustrates two elements of ADDIE Implementation: Design Plan and Lesson Plan.

Figure 3. 43
Elements of ADDIE Implementation (Cycle 1)

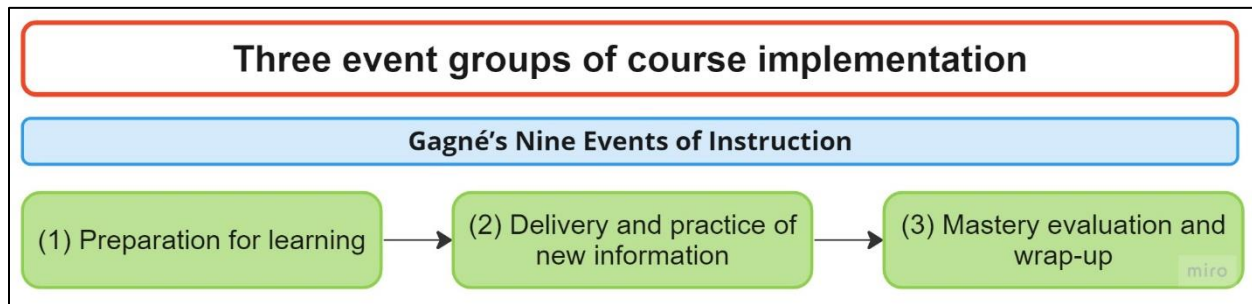


Source: The researcher

The Design Plan serves as an overview of course implementation, while the Lesson Plan guides step-by-step implementation. According to Gagné’s Nine Events of Instruction, ADDIE Implementation is divided into three event groups, namely, (1) pre-course implementation; (2) delivery; and (3) evaluation of implementation (Chaudhuri & Chacko, 2021; Hodell, 2021; Yao, 2021).

Figure 3.44 illustrates the three event groups which make up the ADDIE Implementation phase.

Figure 3.44
Three event groups of ADDIE Implementation



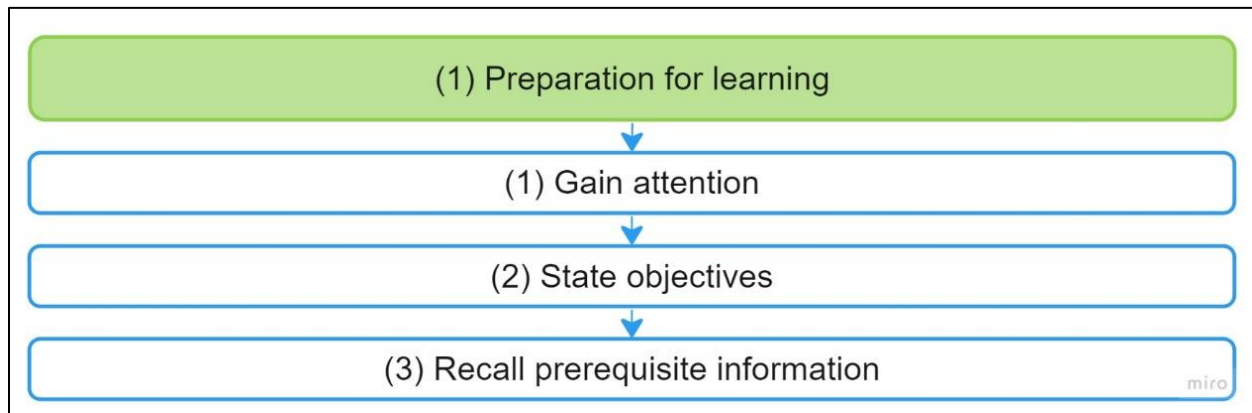
Source: The researcher

Gagné's Nine Events of Instruction and its three event groups emerged as elements of ADDIE Implementation. Implementation takes place through three events, namely, (1) preparation for learning; (2) delivery and practice of new information; and (3) mastery evaluation and wrap-up. The three events groups are sequential from left to right, starting with preparation, then moving to delivery and practice of new information, and lastly mastery, evaluation, and wrap-up. A discussion on the three event groups which make up the Lesson Plan follows.

Event Group 1: Preparation for learning and pre-course implementation. Pre-course implementation focuses on ensuring that the communication, administration, and materials are ready for implementation (Hodell, 2021). Pre-course implementation activities can be broken into timeline segments, e.g., one week, one day, and one hour before implementation (Hodell, 2021). An example of a timeline with pre-implementation tasks is presented in Appendix A.

Once the first session commences, Gagné's Nine Events of Instruction suggest three elements of preparation for learning (Hodell, 2021), namely (1) Gain attention; (2) State objectives and (3) Recall prerequisite information. Figure 3.45 illustrates the three events to Event Group 1: Preparation for learning.

Figure 3. 45
Event group 1: Preparation for learning



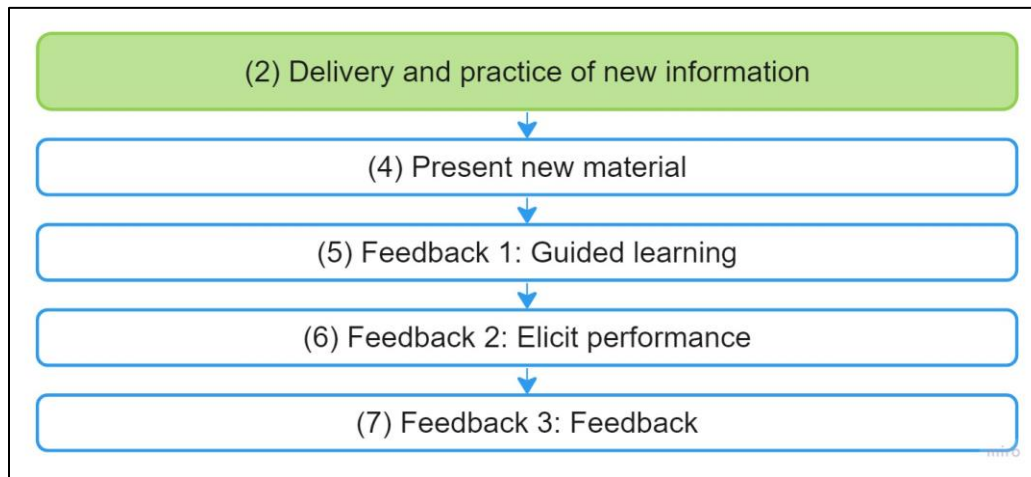
Source: The researcher

During preparation for learning, facilitators should capture participants' attention (Hodell, 2021) and increase participant interest, understanding, and in-class participation (Yao, 2021). A good way to gain attention is to show a short video which illustrates the need and rationale for course participation (Chaudhuri & Chacko, 2021; Hodell, 2021).

Sharing learning objectives and supplementary learning resources should precede in-class delivery of lessons (Raza et al., 2020; Yao, 2021). Clear objectives, shared early on, motivate learners and clarify expectations (Chaudhuri & Chacko, 2021; Raza et al., 2020). Learning objectives serve as a course participation roadmap illustrating what participants should aim to achieve (Hodell, 2021). The 'recall' event addresses prior knowledge (Chaudhuri & Chacko, 2021) and can be achieved through a handout or short review. Recall ensures that all participants have the required knowledge to effectively engage with the new learning material (Hodell, 2021).

Event Group 2: Delivery and practice of new information. Delivery and practice of new information consists of events (4) to (7) of Gagné's Nine Events of Instruction (Hodell, 2021). During delivery and practice of new information, the facilitator (4) presents new material; then provides participant feedback through (5) guided learning; (6) elicits performance and finally (6) provides feedback. Figure 3.46 illustrates the four events of Delivery and practice of new information. A discussion of each event follows.

Figure 3. 46
Event group 2: Delivery and practice



Source: The researcher

The first step to deliver and practice new information is presentation of new material. During presentation of learning material, participants are presented with new knowledge, to supplement or challenge their existing schemata (Sweller, 2016; Sweller et al., 2019). When presented with new information, the information is reorganised in the brain and either sharpens and emphasises current knowledge, or flattens prior information which does not correspond to new knowledge (Sweller, 2016). Without understanding and implementing the principles of human cognition, ID is blind (Sweller, 2016).

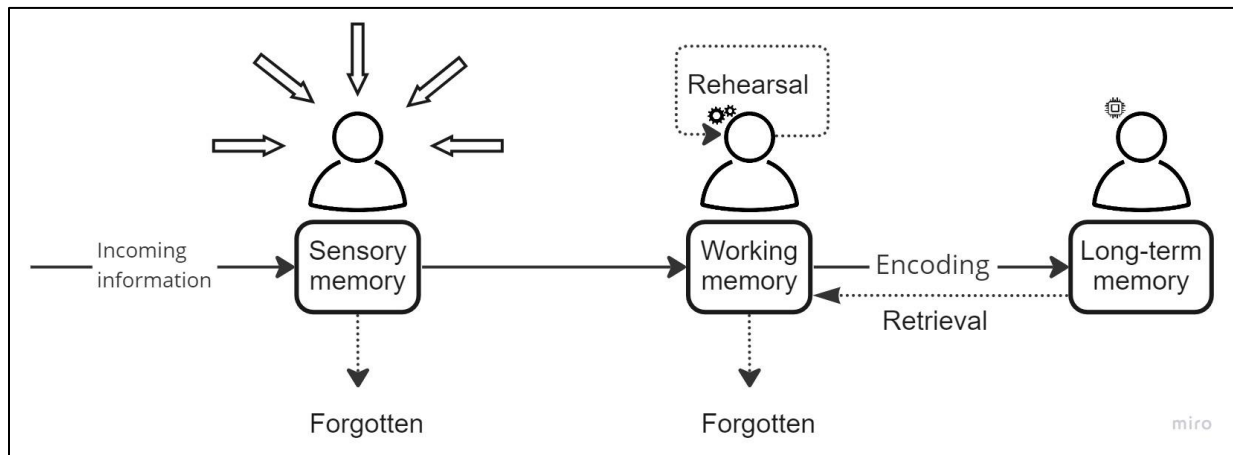
Presentation of new learning material should draw on the principles of Cognitive Load Theory (CLT) (Kolcu et al., 2020). CLT aims to assist designers and facilitators to understand and manage the cognitive load imposed on learners, to optimise learning and facilitate mastery (Hodell, 2021). Learning is the process of forming a cognitive path which transfers new knowledge to long-term memory (Hodell, 2021). Learning is a three-phase cognitive process: information is received (input); information is processed; useful information is stored (Hodell, 2021). Cognitive paths are formed when participants receive an input, apply their knowledge and receive constructive feedback (Hodell, 2021). Learning takes place by connecting new information to prior knowledge to build schemata (Raza et al., 2020; Sweller, 2016) through encoding and decoding (Jalinus et al., 2021). New neural pathways are formed when information is received, interpreted, and stored in long-term memory (Jalinus et al., 2021; Raza et al., 2020; Sweller et al., 2019).

Learning is capped by a time-and-capacity limited working memory (Hodell, 2021). Learning requires rehearsal and repetition for new knowledge to be transferred from short- to long-term

memory (Hodell, 2021; Sweller et al., 2019). Not all input reaches long-term memory (Sweller, 2016). Our brains are designed to sift through information, negotiate and renegotiate meaning, and store only information which is most valuable in the current environment (Sweller, 2016).

Figure 3.47 illustrates the process of learning during delivery and practice of new information.

Figure 3.47
Learning through delivery and practice



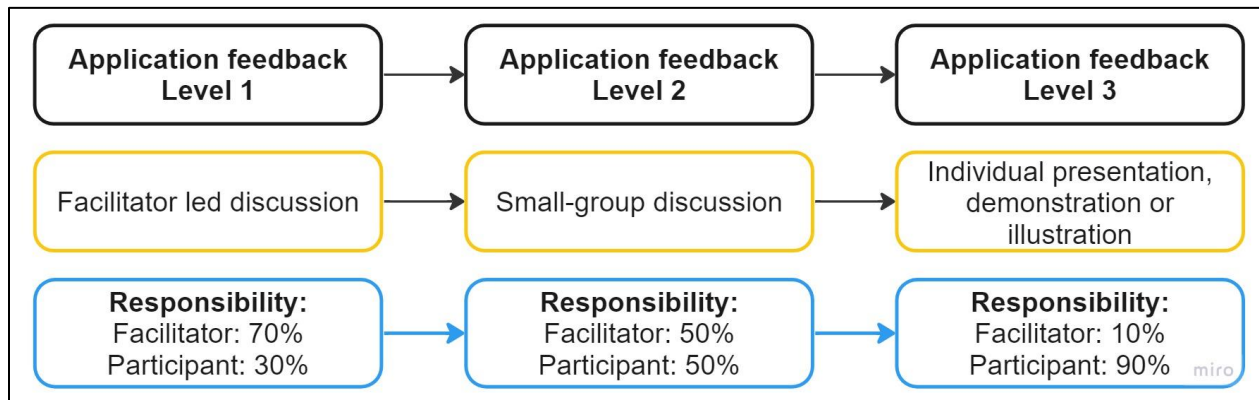
Source: The researcher

Incoming information (input) is received through senses (hearing, sight, smell, touch, or taste) (Sweller, 2016; Sweller et al., 2019). Some information is transferred to working memory, where information is processed through rehearsal, repetition, and practice (Sweller, 2016). During this process, some information is overlapped (Sweller, 2016), while other portions of information are encoded into long-term memory (Jalinus et al., 2021; Sweller, 2016; Sweller et al., 2019). Information, skills, and knowledge are retrieved from working memory and long-term memory when we execute a task (Sweller, 2016).

Learning can take place when participants apply knowledge and receive feedback on their effort, known as application feedback (Hodell, 2021). Application feedback involves interaction between the participants themselves, or participants and the facilitator (Hodell, 2021). Positive feedback is an important factor in student motivation (Mahardhika et al., 2023). Long-term memory is activated through imitation and observation (Sweller, 2016). During application feedback, the participant should practise skills or participate in critical discussions on the requirements for meeting lesson objectives (Hodell, 2021). Students must be granted an opportunity to demonstrate learning through activities and exercise (Raza et al., 2020).

Figure 3.48 illustrates Application feedback levels 1–3, with an example of activities and changes in facilitator and participant responsibility.

Figure 3. 48
Application feedback level 1 - 3



Source: The researcher

Responsibility gradually shifts from the facilitator to the participant from Application feedback 1–3 (Chaudhuri & Chacko, 2021; Hodell, 2021). Application feedback level 1 should involve the facilitator and participant equally (Hodell, 2021). Participants learn from facilitators and one other through observation and interaction (Sweller, 2016). A great method is to facilitate a group discussion on a concept or problem familiar to the group and draw out solutions from the group (Hashim, 2018; Sweller, 2016). Application feedback level 2 should involve individual practice of the required skill in a safe environment (Hodell, 2021). Small-group activities (Hashim, 2018), with groups of three to five (Spatioti et al., 2022), and no more than 10 (Pereira et al., 2021), work well for level 2 feedback (Chaudhuri & Chacko, 2021). The role of the facilitator during level 2 is to provide guidance and answers where learners cannot find answers among themselves (Chaudhuri & Chacko, 2021). During application feedback level 3, individual learners should receive progress and performance feedback from the facilitator (Chaudhuri & Chacko, 2021; Hodell, 2021).

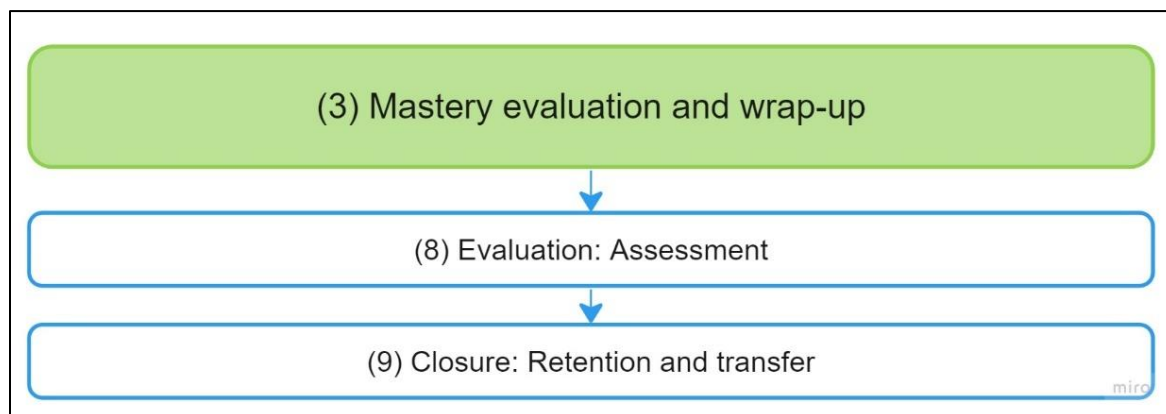
Various delivery methods can be used for course implementation. Pereira et al. (2021) describe nine methods of delivery, namely, (1) case-based learning; (2) lectures; (3) reflective exercises; (4) trigger videos; (5) small group learning; (6) large group learning; (7) role play; (8) white board; and (9) parking lot. The researcher adds (10) flipped classroom as a prominent method of delivery in blended learning (Hamzah et al., 2022; Naidoo et al., 2021; Nurhayati et al., 2021; Sayiner & Ergönül, 2021). Table 11 in Appendix A illustrates the 10 delivery methods, with a brief discussion of each.

Evaluation of implementation is a critical part of course implementation (Hodell, 2021) and the instructional designer’s main role during implementation (Hodell, 2021). Evaluation informs every

stage of the ADDIE process and ensures that the course develops and improves through every cycle (Brouwer, Fleerackers, et al., 2022). The researcher will discuss evaluation of mastery in the chapter on ADDIE Evaluation.

Event Group 3: Mastery, evaluation, and wrap-up. Mastery, evaluation, and wrap-up involves two events, namely evaluation through assessment and closure, where retention and transfer is evaluated. Figure 3.49 illustrates the events of Mastery, evaluation and wrap-up.

Figure 3. 49
Mastery evaluation and wrap-up



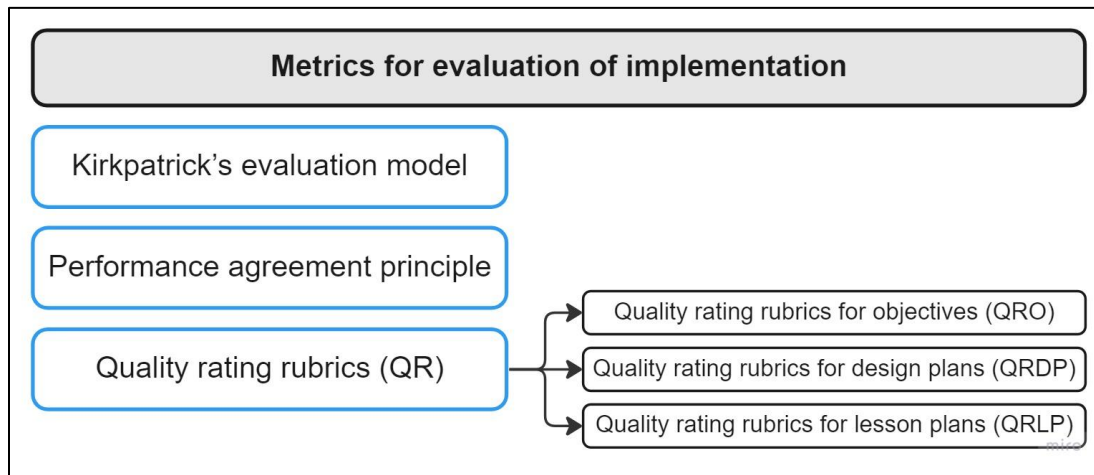
Source: The researcher

Evaluation is achieved through assessment of learning and is intended to measure the effectiveness of learning by evaluating retention and ability to transfer knowledge.

Evaluation can be formative (evaluation for learning) or summative (evaluation of learning) (Jonnalagadda et al., 2022; Razak et al., 2020). Formative evaluation (also known as continuous assessment) is carried out in stages throughout the course (Jonnalagadda et al., 2022; Razak et al., 2020) and is a crucial element of the teaching-and-learning process (Raza et al., 2020). Formative evaluation stimulates learning through immediate facilitator-learner feedback during course implementation (Day, 2016). Summative evaluation is performed as an overall evaluation of module activities and mastery of learning outcomes at the end of a learning programme (Jonnalagadda et al., 2022; Razak et al., 2020).

According to Hodell (2021), evaluation during course implementation can consider three evaluation metrics. These include Kirkpatrick's evaluation model; performance agreement principle; and quality rating rubrics for the objectives of Design plans and Lesson plans (Hodell, 2021). Figure 3.50 illustrates three metrics for evaluation of implementation.

Figure 3.50
Metrics for evaluation of implementation

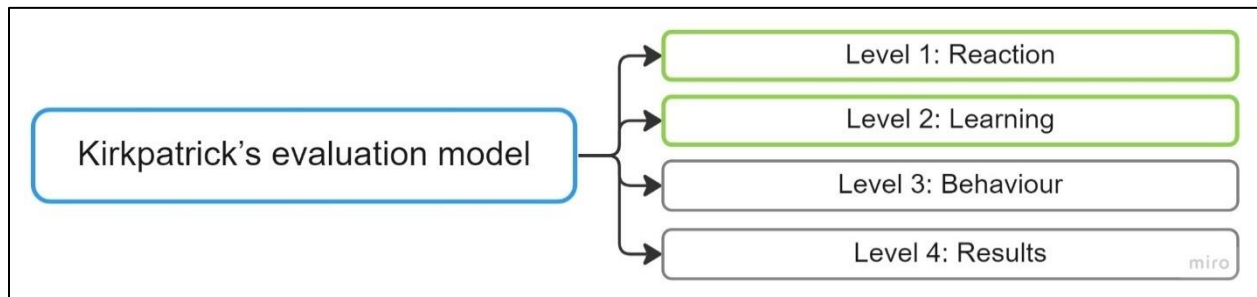


Source: The researcher

Kirkpatrick's evaluation model, performance agreement principle and the three quality rating rubrics are discussed.

The Kirkpatrick Model of evaluation. The Kirkpatrick Model of evaluation is widely used to evaluate training programmes (Chaudhuri & Chacko, 2021; Fernandes et al., 2020; Ismail & Jaafar, 2022; Naidoo et al., 2021; Stemp et al., 2022). The model performs evaluations on four levels: Level 1, Reaction; Level 2, Learning; Level 3, Behaviour; and Level 4, Results (Chaudhuri & Chacko, 2021; Fernandes et al., 2020; Hodell, 2021; Ismail & Jaafar, 2022). Levels 1 and 2, reaction and learning, are the only levels that require assessment as part of the implementation phase. Formative evaluation is associated with level 1 (evaluation of learner reaction) and level 2 evaluation (evaluation of learning) (Hodell, 2021). Behaviour and results (levels 3 and 4) form part of the formal evaluation process, which will be covered later in ADDIE Evaluation. Summative evaluation is associated with level 3 evaluation (evaluation of learner behaviour) (Hodell, 2021). Summative evaluation will be discussed in the Evaluation phase of the ADDIE Model of ID. Figure 3.51 illustrates Kirkpatrick's four levels of evaluation.

Figure 3. 51
Kirkpatrick's four levels of evaluation



Source: The researcher

The four levels of Kirkpatrick's levels of evaluation are discussed to clarify levels 1 and 2. Levels 3 and 4 are discussed in the ADDIE Evaluation phase.

Level 1: Reaction. Level 1 evaluation evaluates participants' reaction to the course, during (Stemp et al., 2022), and upon course completion (Fernandes et al., 2020; Hodell, 2021). The purpose of level 1 evaluation is to evaluate learner satisfaction with the course (Fernandes et al., 2020; Naidoo et al., 2021; Stemp et al., 2022). Designers want to evaluate whether participants find the course favourable, engaging and relevant to their work (Ismail & Jaafar, 2022). Early evaluation of learner reaction increases learner satisfaction, as designers use feedback to make changes and improve course design early on (Stemp et al., 2022).

Reaction can be evaluated through survey tools such as a Likert scale (Naidoo et al., 2021), questionnaires (Stemp et al., 2022), smile sheets, focus group discussions or individual interviews with select participants (Hodell, 2021). Awarding more time post-course or module completion, and allowing voluntary participation in level 1 evaluation, increases the risk of skewed reaction data (Hodell, 2021; Stemp et al., 2022). Reaction can be evaluated through printed or online questionnaires such as Google Forms.

Evaluation of participant reaction does not evaluate mastery of learning objectives (Hodell, 2021). Some courses may not be enjoyable, regardless of the design. Implementing a reaction evaluation is, however, useful for establishing participant reactions and highlighting areas which require improvement (Hodell, 2021). Examples of questions that can be asked to evaluate participant reactions can be found in Appendix A.

Level 2: Learning (performance agreement principle). Level 2 evaluation quantifies learning through assessment and exams (Stemp et al., 2022). Level 2 evaluation evaluates cognitive development (Naidoo et al., 2021), or how much participants learned through the programme

(Fernandes et al., 2020). Evaluation of learning is directly tied to the process of achieving course objectives (Hodell, 2021; Sood et al., 2020) by measuring whether learners acquired the intended skills, knowledge and attitudes, and committed to the training (Ismail & Jaafar, 2022; Sood et al., 2020).

Various assessment methods are used for assessment of learning. Learning is assessed using multiple-choice questions; oral assessments; electronic portfolios; or behavioural observation (Stemp et al., 2022).

Evaluation tasks should be tied directly to learning objectives (Raza et al., 2020). Every activity should contribute toward retention of skills and knowledge (Raza et al., 2020). Active learning moves input from short-term to long-term memory and include activities such as revision, exercise, and drawing concept maps to (Raza et al., 2020). Cognitive development can be assessed through formative and summative assessment (Naidoo et al., 2021)

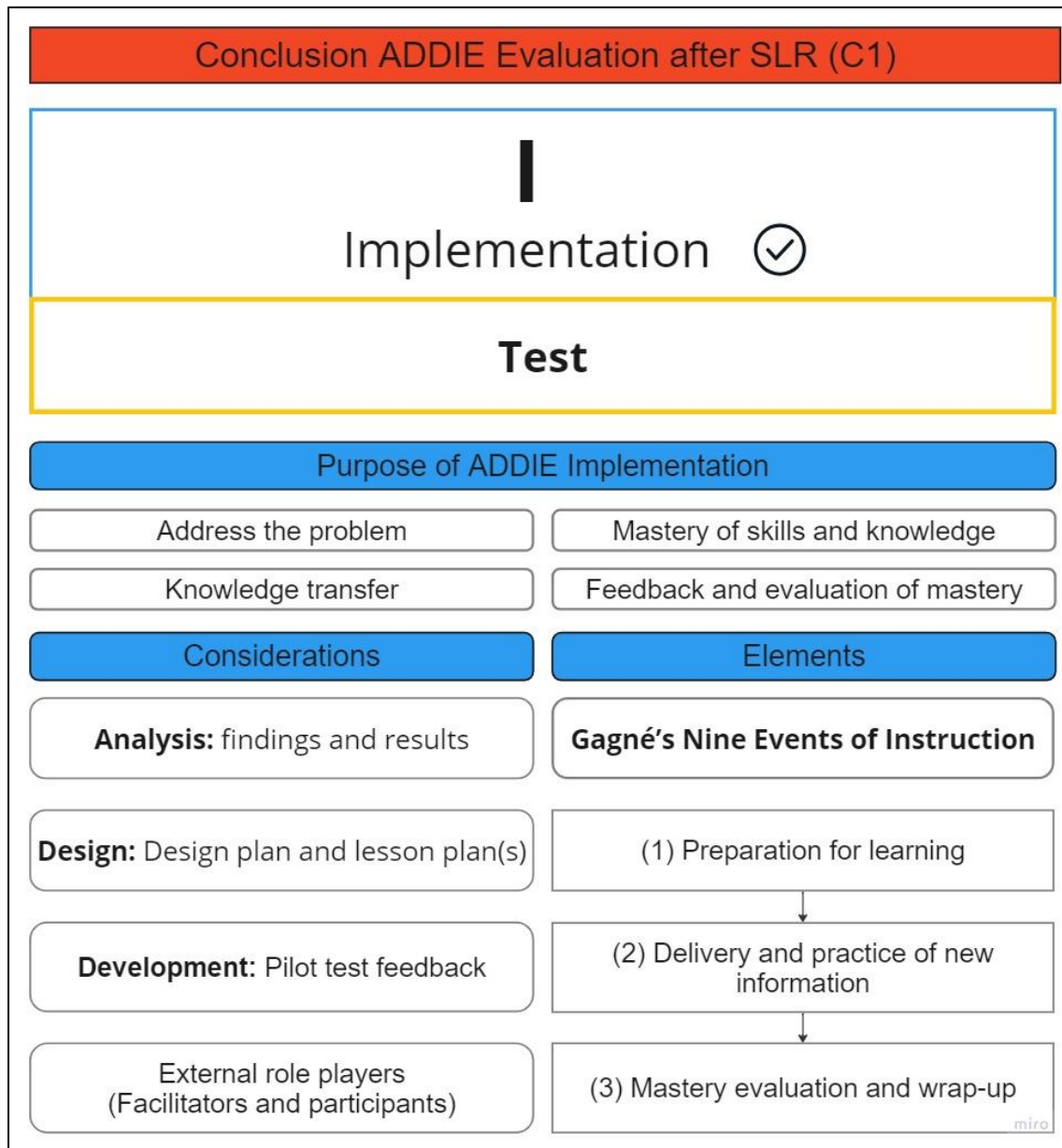
Other sources of evaluation of implementation. Evaluation of implementation improves course design and ensures that a project matures through every cycle (Hodell, 2021). Course design can be improved through facilitator feedback; evaluation of materials and technology; evaluation of learning environment; and evaluation of implementation continuity (Hodell, 2021). Hodell (2021) suggests the use of quality rating rubrics as other means of evaluating implementation. Quality rating rubrics are discussed in Appendix A, Quality Rating Rubrics. Table 9 in Appendix A also provides an example of an adapted QRLP quantitative evaluation table.

The researcher has now concluded the fourth phase of the ADDIE process. In the following section, the researcher will address the ADDIE Evaluation Phase.

C) Conclusion: Elements and Considerations of ADDIE Implementation

The researcher concludes that ADDIE Implementation is used to address the identified problem from the ADDIE Analysis Phase; master skills and knowledge; transfer knowledge and provide feedback and evaluation of mastery. The researcher finds that a course designer can consider the findings of the ADDIE Analysis, Design and Development phase, as well as the input of external role players. Gagné's Nine Events of Instruction emerge as elemental to course implementation. Figure 3.52 illustrates the findings and results for Cycle 1, SLR on ADDIE Implementation.

Figure 3. 52
Conclusion to ADDIE Implementation (Cycle 1)



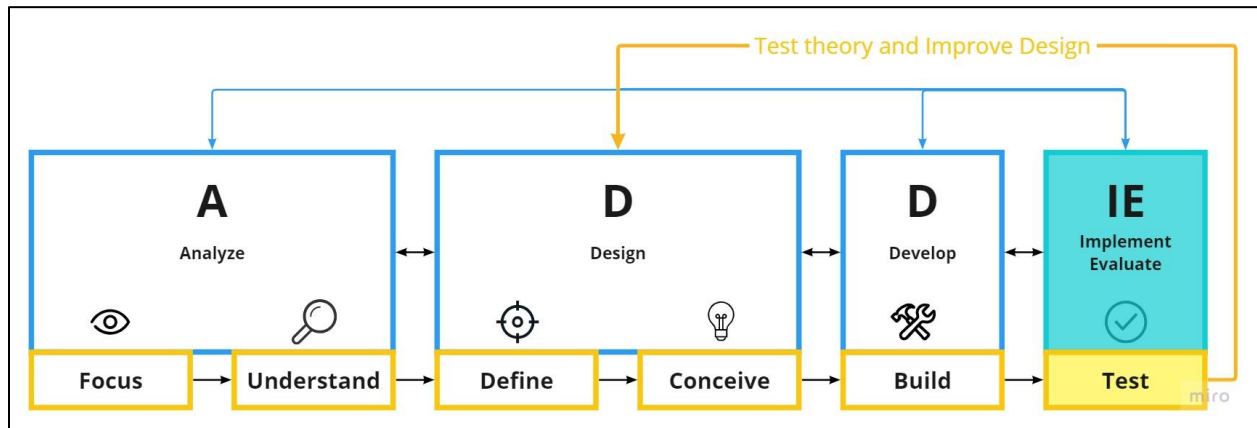
Source: The researcher

Figure 3.52 presents a summary of the purpose, considerations, and elements of ADDIE Implementation after Cycle 1, Chapter 3. In the following section, the researcher will address the ADDIE Evaluation Phase.

3.8.3.5 ADDIE Evaluation Phase

In this section, the researcher establishes the elements of Evaluation (E) through the lens of the title of the study: Elements of blended continuous professional development short course design for educators. Figure 3.53 illustrates where ADDIE Evaluation is situated in the ADDIE Model of ID, and how it correlates with the phase of DBR as described by Easterday et al. (2014).

Figure 3.53
ADDIE Evaluation and the DBR Test Phase



Source: The researcher

In the DBR Test phase, the effectiveness of the developed course should be tested in a real-world learning environment. The test is performed in the form of ADDIE Implementation and Evaluation.

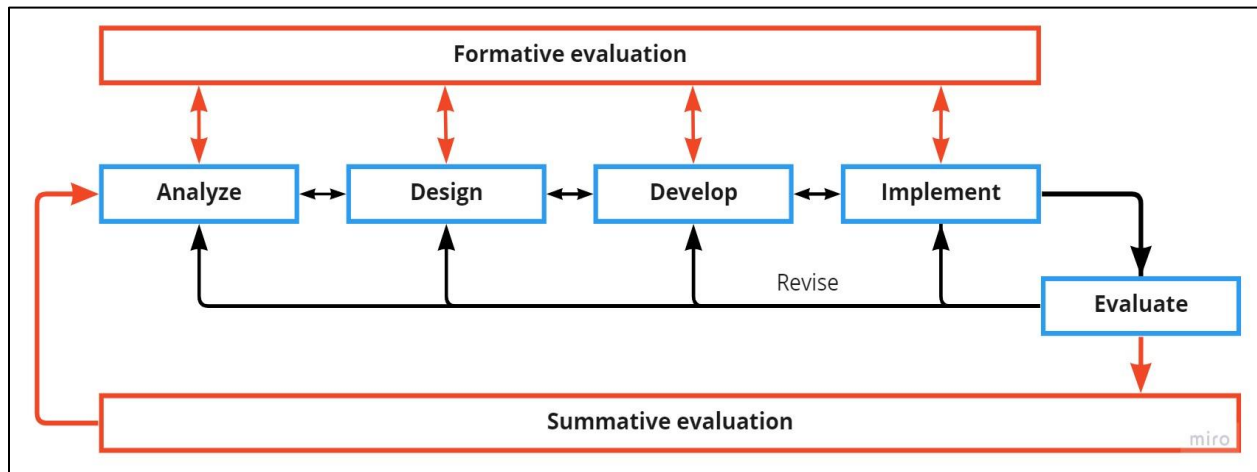
The Evaluation phase (E) is the final step in the ADDIE process of ID. The purpose of evaluation is to expose learning gaps and identify areas of improvement in the course design (Adnan & Ritzhaupt, 2018; Hodell, 2021; Naidoo et al., 2021; Sayiner & Ergönül, 2021).

A) Considerations of ADDIE Evaluation

Two considerations emerge for the ADDIE Evaluation phase. Researchers must consider the purpose of evaluation and which method of evaluation is most suited to achieve the intended purpose. Evaluation can be performed quantitatively and/or qualitatively (Patel et al., 2018), and can be formative (evaluation for learning) or summative (evaluation of learning) (Hodell, 2021; Patel et al., 2018). Despite being the final step, evaluation is not an isolated event and should take place formatively throughout the ADDIE process (Alsaleh, 2020; Hodell, 2021; Shakeel et al., 2022; Zhang, 2020) because formative evaluation yields higher response rates than summative evaluations (Stemp et al., 2022). Formative evaluation gives the designer continuous insight to learner mastery and provides designer feedback on each phase of the ADDIE process, which can be used to improve course design in future cycles (Razak et al., 2020). Summative

evaluation takes place at the end of the ADDIE process as part of the final evaluation phase (Razak et al., 2020). Summative evaluation also informs course design decisions for future cycles of the course. Figure 3.54 illustrates the relationship between the ADDIE process, summative evaluation, and formative evaluation.

Figure 3.54
Formative and Summative evaluation



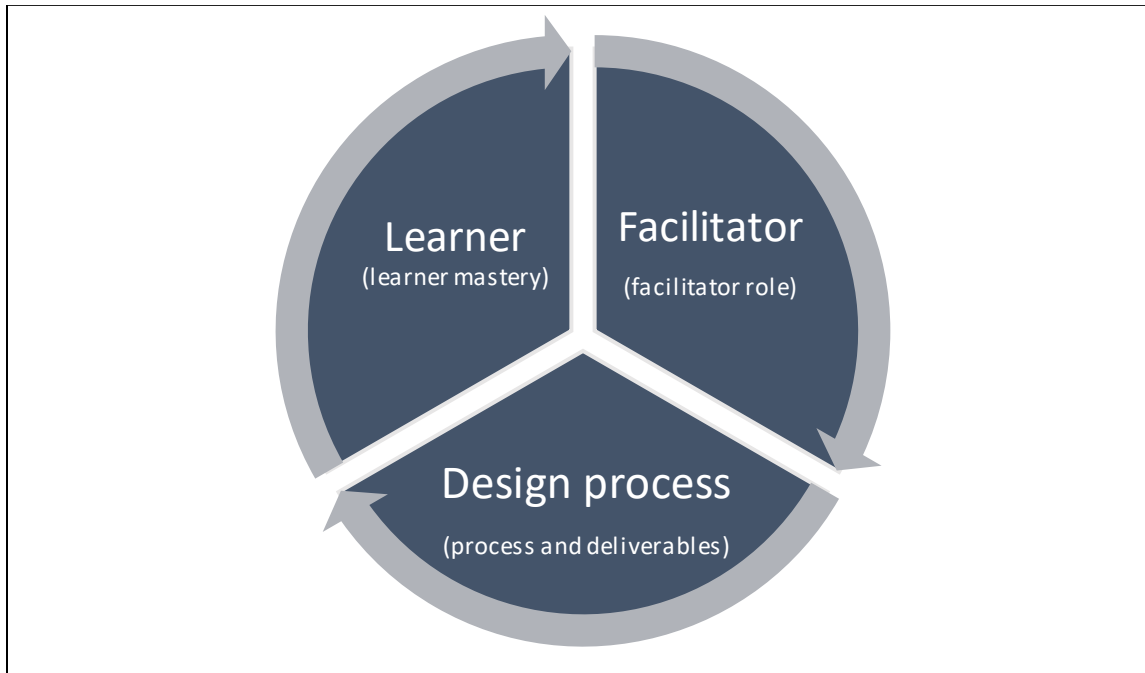
Source: Adapted from Ghani and Daud (2018) and Shakeel et al. (2022)

Figure 3.54 shows how formative evaluation should inform every phase of the ADDIE process, as is suggested by DBR in 2.5. Reflexive design should facilitate continuous improvement of design and implementation during the ADDIE process. Summative evaluation takes place at the end of the ADDIE process and should inform the ADDIE process for future iterations.

B) Elements of ADDIE Evaluation

Evaluation should measure the extent to which the desired learning objectives were achieved, but should stretch much wider than pure evaluation of learning (Hodell, 2021). Three elements of evaluation emerged in the SLR, namely, (1) learner evaluation; (2) facilitator evaluation; and (3) design process evaluation (Chaudhuri & Chacko, 2021; Hodell, 2021). Figure 3.55 illustrates the three elements of evaluation.

Figure 3.55
Three elements of ADDIE Evaluation

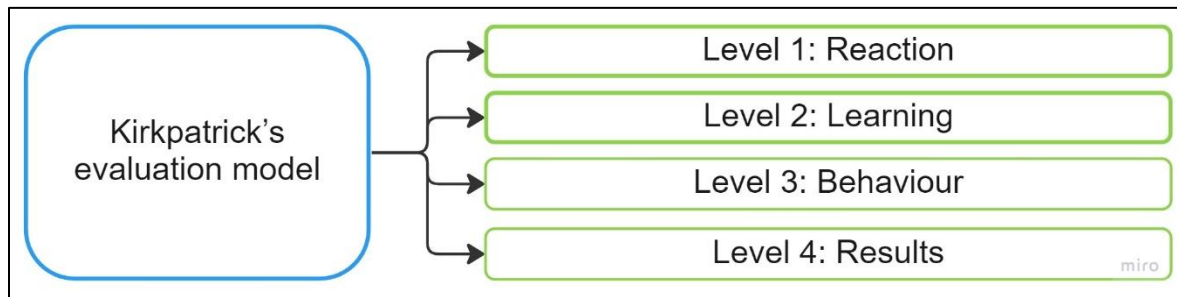


Source: Adapted from Hodell (2021)

Learner evaluation is concerned with evaluation of learners' mastery of learning objectives (Hodell, 2021). Learner evaluation should evaluate student perceptions, student learning (theoretical) and practical student performance (Branch, 2014; Piskurich, 2015). Facilitator evaluation evaluates the facilitator's role in learner mastery (Hodell, 2021). Design process evaluation is concerned with the design process and course development deliverables (Hodell, 2021). The researcher will now discuss each of the three elements of ADDIE Evaluation.

Learner evaluation. The researcher starts the discussion on learner evaluation by continuing the previous discussion on Kirkpatrick's four levels of evaluation. The four levels, as discussed by Hodell (2021), are evaluation of (1) learner reaction; (2) learning; (3) behaviour; and (4) results. Figure 3.56 illustrates the four levels of learner evaluation.

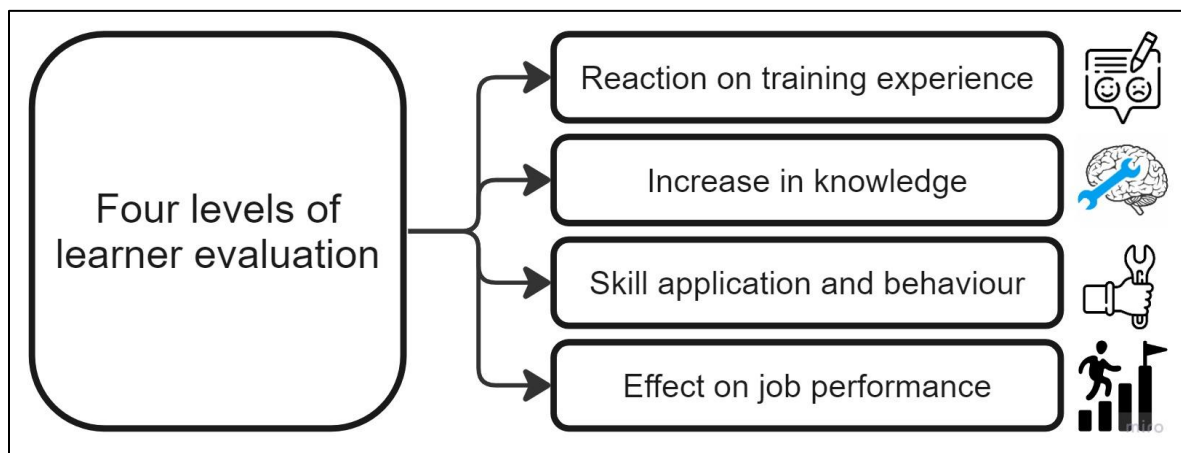
Figure 3.56
Kirkpatrick's four levels of learner evaluation



Source: The researcher

Similarly, both Patel et al. (2018) and Fernandes et al. (2020) propose four levels of evaluation. Figure 3.57 illustrates the four levels of evaluation as presented by Patel et al. (2018).

Figure 3.57
Four levels of learner evaluation



Source: Compiled from Patel et al. (2018)

Patel et al. (2018) categorise learner evaluation as evaluation of the learners: (1) reaction on the training experience; (2) increase in knowledge resulting from learning; (3) change in skill application and behaviour; and (4) the result and effect on work and job performance.

The researcher continues the discussion on Kirkpatrick's levels of evaluation. The reader will recall that levels 1 and 2 of Kirkpatrick's levels of evaluation were discussed as a part of the ADDIE Implementation phase in 3.7.3.4. The reader is welcome to revisit evaluation level 1: Learner reaction and level 2: learning in the section on implementation. To summarise, level 1 evaluation (of reaction) is primarily concerned with the learners' experience of the course (irrespective of mastery), while level 2 evaluation (of learning) is concerned with mastery of learning objectives. During the final evaluation process, learner behaviour and results play an

important role in assessing course effectiveness. The researcher continues the discussion on level 3: behaviour and level 4: results.

Level 3: Behaviour. Evaluation of behaviour evaluates whether participants were truly impacted by the training programme to the extent where knowledge and skills are applied in the intended environment (Ismail & Jaafar, 2022; Razak et al., 2020; Stemp et al., 2022). Level 3 evaluation can be done in a real working environment, months or even years (Stemp et al., 2022) after conclusion of the programme (Alsaleh, 2020; Chaudhuri & Chacko, 2021). Through behavioural evaluation, designers can ascertain that skills and knowledge were effectively transferred from the facilitator to the participant (Hodell, 2021). The facilitator delivers the course content to enable participants to implement the newly mastered skill or knowledge in their workplace (Hodell, 2021). The question to answer during evaluation of behaviour is therefore, “did the training affect workplace behaviour?” (Fernandes et al., 2020; Ismail & Jaafar, 2022).

Should evaluation indicate that there was no or very little change in behaviour, Hodell (2021) suggests that this may be due to three possible factors. Firstly, the participant may never have learned the skill. Secondly, the skill or concept may never have been retained. Lastly, the skill or concept may never have been used after course completion. Failure to learn the skill could be the result of errors in design or implementation (Hodell, 2021).

Level 4: Results. Evaluation of results evaluates the extent to which the course accomplished the organisational objectives (Fernandes et al., 2020; Hodell, 2021; Ismail & Jaafar, 2022). Evaluation of results includes facilitator evaluation, learner evaluation and design process evaluation (Hodell, 2021). Each of these types of evaluation is discussed.

Learner evaluation. Learner evaluation takes place on the first three evaluation levels as discussed earlier in this chapter. These levels include level 1 (learner reaction); level 2 (learning); and level 3 (behaviour) (Hodell, 2021).

Facilitator evaluation. Facilitators play a pivotal role in moving learners to mastery (Hodell, 2021). Facilitators impact course mastery and learner experience and should therefore form part of the evaluation process. Formative evaluation of teachers runs through the entire design process and is used to improve course design (Razak et al., 2020; Yao, 2021).

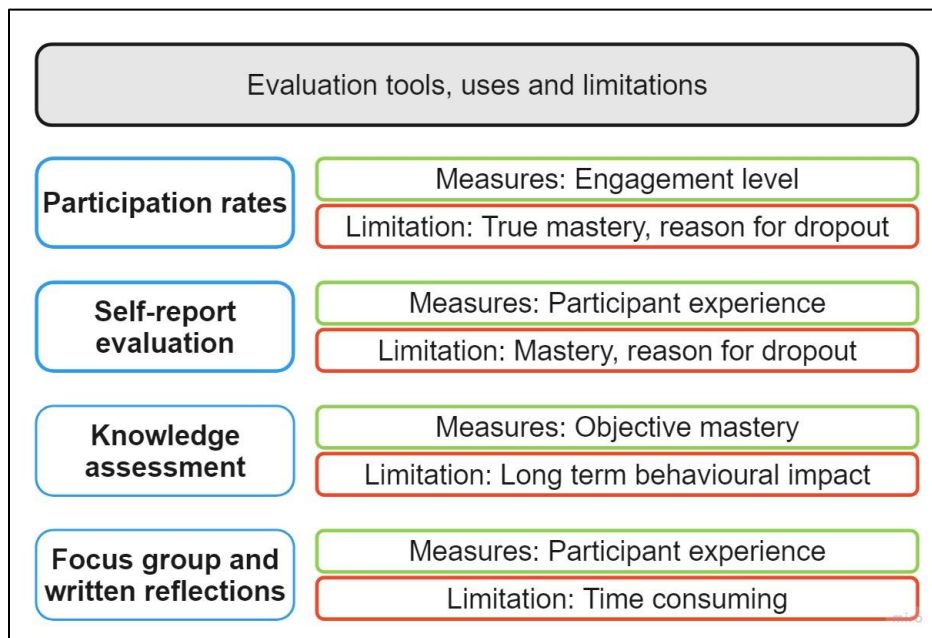
Facilitator evaluation should include evaluation of facilitator: (1) credentials (are they qualified to facilitate the course?); (2) teaching style (did facilitators connect with participants in a meaningful way?); (3) implementation of course structure (facilitators demonstrated behavioural objectives

and evaluated learner mastery); and (4) effectiveness (the extent to which most of the participating population mastered learning objectives) (Hodell, 2021).

Design process evaluation. Design process evaluation ensures that evaluation takes place beyond the learners and facilitators (Hodell, 2021). Design process evaluation can point out critical design issues for future cycles of the course (Hodell, 2021; Sayiner & Ergönül, 2021). Both formative evaluation and summative evaluation play an important role in course design improvement (Sayiner & Ergönül, 2021). Feedback, gathered through evaluation of design, should be used to modify teaching design for future cycles of the course (Sayiner & Ergönül, 2021; Yao, 2021).

Evaluation tools. Stemp et al. (2022) suggest four appropriate evaluation tools for measuring the effectiveness of online courses. These tools include evaluation of (1) participation rates; (2) self-report evaluation; (3) knowledge assessment; and (4) focus group and written reflections. Figure 3.58 illustrates each of the four evaluation tools, followed by a brief description of each.

Figure 3.58
Evaluation of online courses



Source: Compiled from Pereira et al. (2021)

Participation rates are a metric of student engagement but provide little evidence of learning or reason for drop-out (Stemp et al., 2022). Self-report evaluations provide valuable insight into participant experience about the course and course facilitators (Alsaleh, 2020; Stemp et al., 2022). Knowledge assessments can be done before, during and after the course to measure

learning effectiveness and mastery (Pereira et al., 2021; Stemp et al., 2022). Pre- and post-knowledge assessments can be used to quantify learning as a result of course participation (Alsaleh, 2020). Mid-course assessment (formative) and final exams (summative) can be paired with follow-up questionnaires to measure the long-term impact of the course (Stemp et al., 2022). Focus group and open-ended questions (Alsaleh, 2020) offer qualitative insight into participant experiences (Stemp et al., 2022). It is, however, time-consuming and can be substituted with written reflections and bolstered by incentives such as grades (Stemp et al., 2022), or digital badges (Flynn et al., 2023).

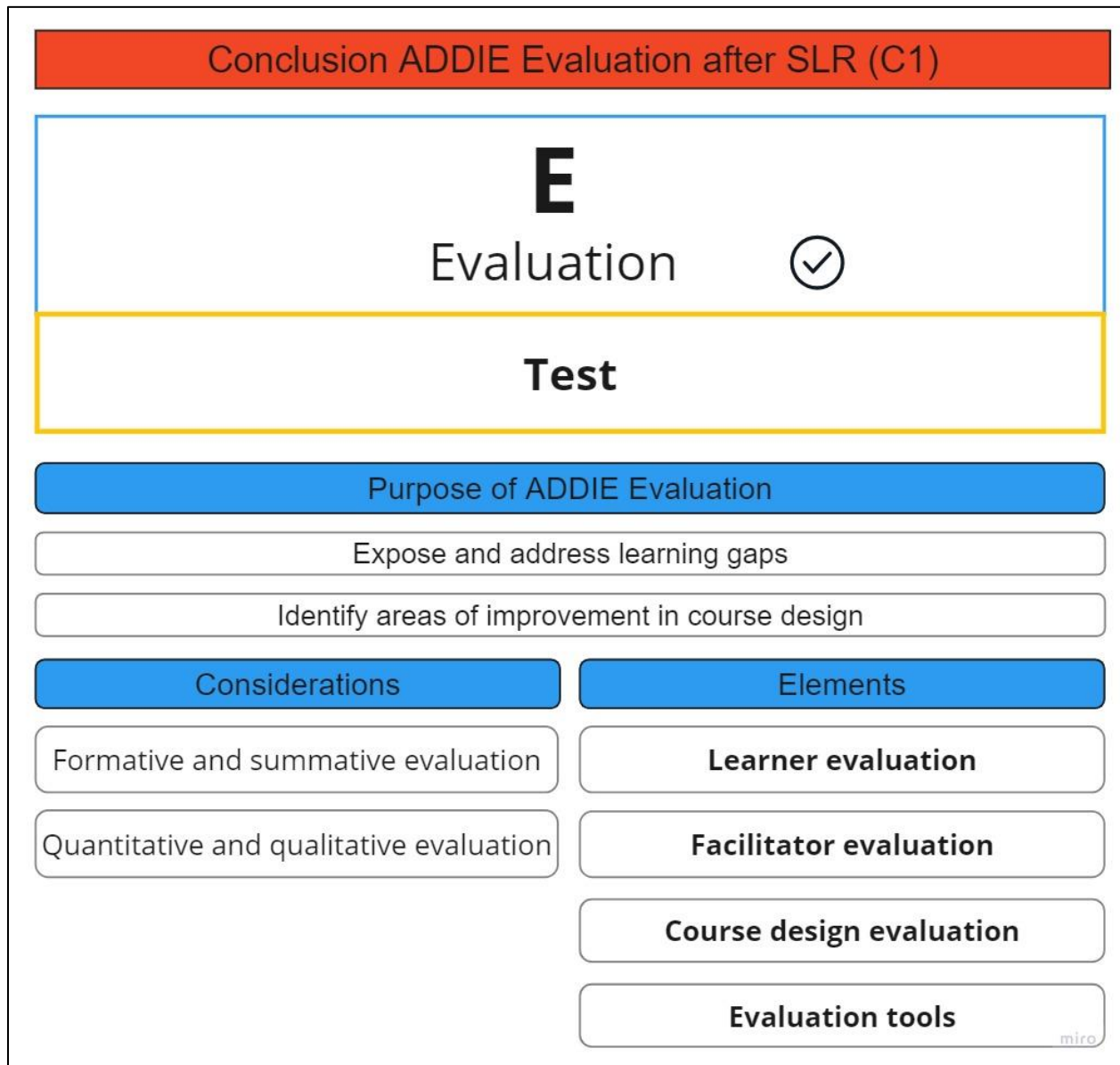
Evaluation of evaluation. Evaluation of evaluation serves as an opportunity to think retrospectively about the design product and process (Hodell, 2021). Evaluation should measure every aspect of the design product and the process and be able to show objectively that they meet the standards of performance (Hodell, 2021). Evaluation of evaluation is used to gather objective data from every person involved in the project through a project-end review (Hodell, 2021). The evaluation phase must be used to identify and fix problems relating to product or process to improve future cycles of the course (Hodell, 2021).

The researcher has now concluded the fifth and final phase of the ADDIE process. In the following section, the researcher will address criticism of the ADDIE Model of ID.

C) Conclusion: Elements and Considerations of ADDIE Evaluation

The researcher concludes that ADDIE Evaluations are used to expose and address learning gaps, as well as identify and address areas of improvement in course design. The researcher finds that a course designer can consider using formative or summative evaluation, as well as quantitative or qualitative evaluation, or a combination of these evaluation approaches. Four elements of evaluation emerged, namely, learner evaluation; facilitator evaluation; course design evaluation; and use of evaluation tools. Figure 3.59 illustrates the findings and results for Cycle 1, SLR on ADDIE Evaluation.

Figure 3. 59
Conclusion to ADDIE Evaluation (Cycle 1)



Source: The researcher

Figure 3.59 presents a summary of the purpose, considerations, and elements of ADDIE Evaluation after Cycle 1, Chapter 3. In the following section, the researcher will address criticism of the ADDIE ID Model.

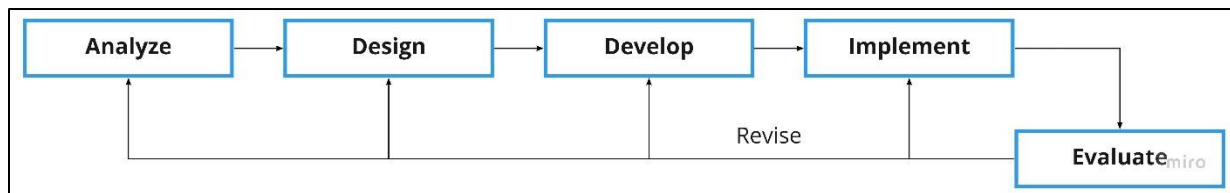
3.8.4 Criticism of the ADDIE Model of ID

The ADDIE Model, like many other ID models, is criticised for its ‘rigid’ linear appearance (Adnan & Ritzhaupt, 2018; Molenda, 2015; Spatioti et al., 2022). Adnan and Ritzhaupt (2018) add that some researchers argue that ADDIE is too rigid, too clumsy for rapidly changing digital environments, not focused on identifying behavioural changes, and insufficient for producing learning outcomes (Adnan & Ritzhaupt, 2018).

Despite the criticism, ADDIE’s integrity, flexibility and simplicity makes it one of the most popular design models in the world (Spatioti et al., 2022). Many of the perceived disadvantages of the ADDIE Model are a result of mistakes on the part of instructional designers (Adnan & Ritzhaupt, 2018; Spatioti et al., 2022).

The ADDIE Model is illustrated in Figure 3.60.

Figure 3. 60
The ADDIE Process of Instructional Design



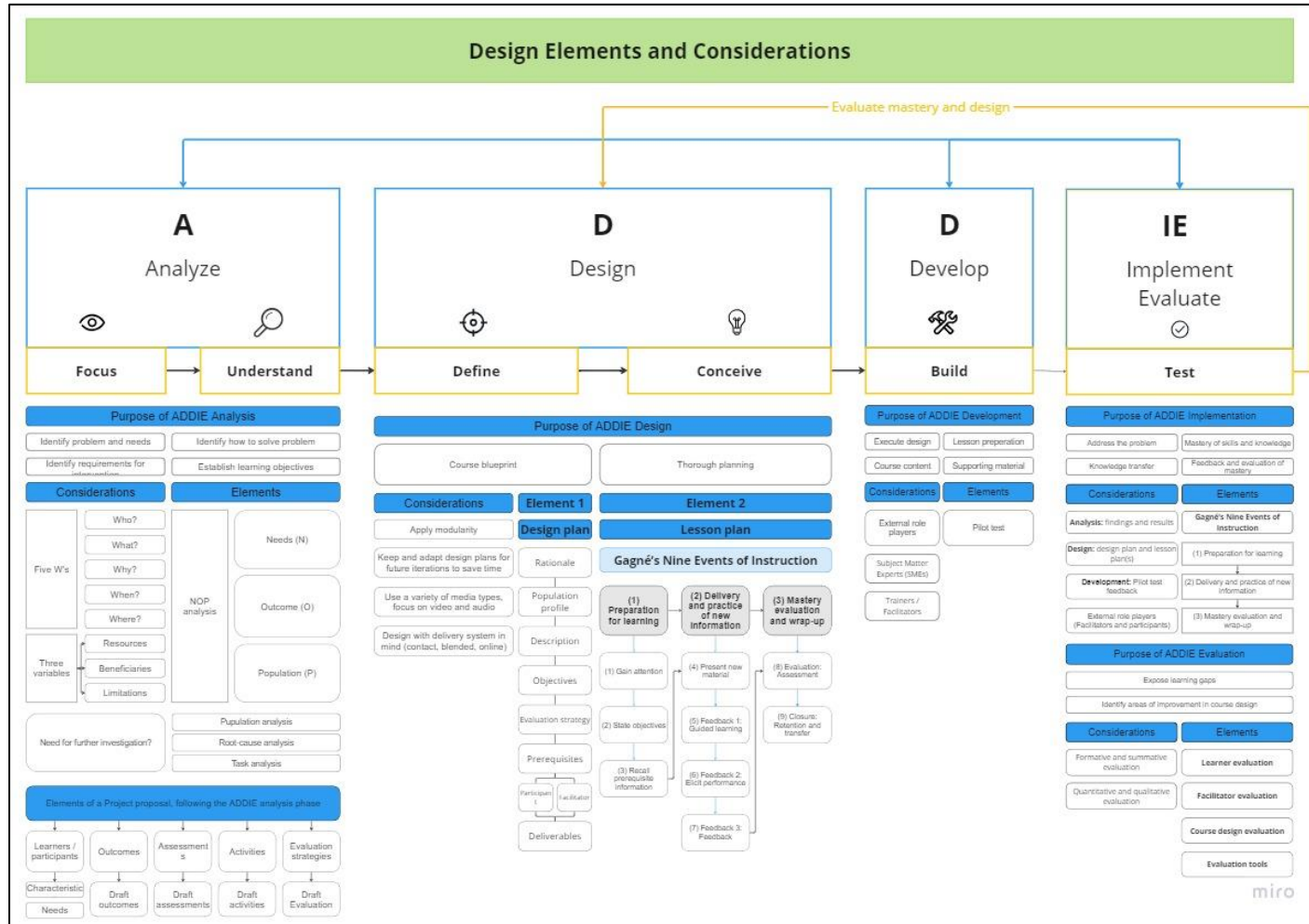
Source: The researcher

The model is presented as a linear model, with revisions only encouraged to preceding phases, upon completion of the Evaluation phase. A linear approach limits much needed ongoing reflection and user-feedback, as suggested by DBR.

3.8.5 Design conclusion: Considerations and elements

The researcher concludes the Design Elements section with Figure 3.63, which illustrates the purpose, considerations, and elements of course design. The researcher concludes that implementation of a strong ID model, such as the ADDIE Model, is the most important design element. A designer must take a systematic approach to course design, including Analysis, Design, Development, Implementation and Evaluation. Upon conclusion of the design considerations and elements, the researcher continues the SLR, in the following section, by addressing the considerations and elements associated with blended learning programmes. The considerations and elements of each phase of the ADDIE Model are presented in Figure 3.61.

Figure 3.61
Considerations and elements of the ADDIE Model



Source: The researcher

Figure 3.61 presents the conclusion to the purpose, considerations, and elements for each phase of the ADDIE ID Model as discussed in section 3.7.

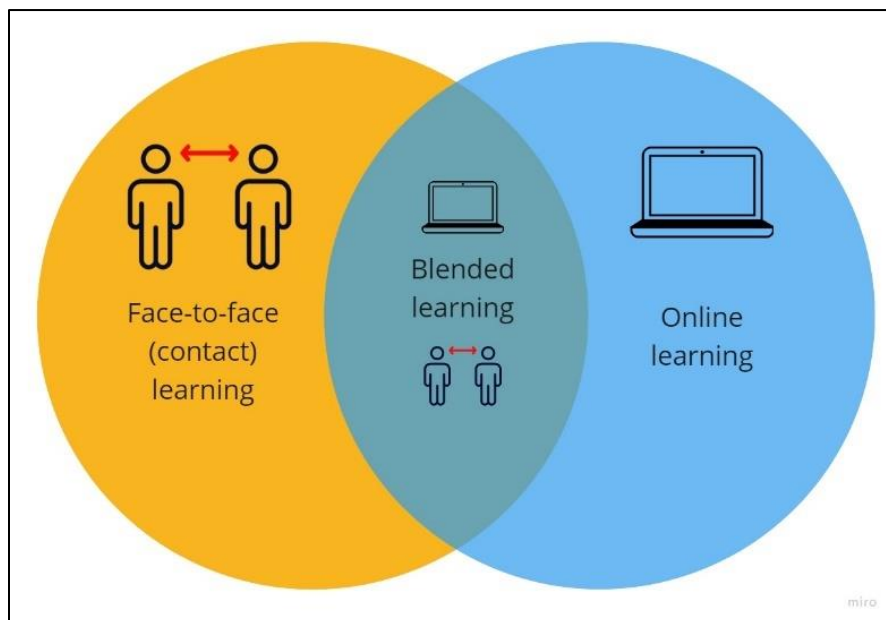
3.9 Blended learning

In this section, the researcher presents the meaning, and aims to establish the elements and considerations of, a blended learning programme. The researcher introduces the reader to the term ‘blended learning’ and compares F2F instruction with online learning and mobile learning. Following this, the researcher discusses online content creation and the use of an LMS as a tool for facilitating blended learning programmes. The role of human interaction is discussed before the researcher concludes the elements and considerations of blended learning design.

3.9.1 Introduction to blended learning

Blended learning is a technology-enhanced method of learning which uses a combination of F2F instruction and technology-integrated instruction (Dziuban et al., 2018; Hamzah et al., 2022; Jalinus et al., 2021; Ratheeswari, 2018; Ridwan et al., 2020; Risdianto, 2018) to make learning programmes more effective (Dziuban et al., 2018; Risdianto, 2018), efficient, and enjoyable (Schweighofer et al., 2019; Serevina & Meyputri, 2021). Technology integration in learning programmes can improve access, collaboration, communication, and interaction (Ghani & Daud, 2018; Sayiner & Ergönül, 2021) and is referred to as the new traditional model of course delivery (Dziuban et al., 2018). Figure 3.62 illustrates the combination of F2F learning and online learning to give a blended learning experience.

Figure 3.62
Blended learning



Source: The researcher

Blended learning is illustrated as the integration of F2F learning and computer-integrated- and online learning. It combines technology integration with human connection and instruction.

Blended learning enables a student-centred (Ridwan et al., 2020), flipped classroom approach to instruction (Hamzah et al., 2022; Naidoo et al., 2021; Nurhayati et al., 2021; Sayiner & Ergönül, 2021). Learners have the opportunity to engage with content and perform low-order cognitive tasks outside the classroom and engage with high-order thinking skills in F2F classes (Merriam & Baumgartner, 2020; Sayiner & Ergönül, 2021), thereby increasing the efficiency and impact of F2F instruction (Nurhayati et al., 2021; Purwani & Dewi, 2021).

Blended classrooms increase learner engagement, confidence and academic success (Shakeel et al., 2022). A direct correlation exists between learner engagement and learning outcome attainment (Arghode et al., 2018; Mulyati et al., 2020). Blended learning increases students' intellectual, behavioural and emotional participation (Shakeel et al., 2022). Learners' engagement is displayed cognitively (content engagement), behaviourally (compliance with class rules and expectations) and emotionally (learners express interest and a desire to learn) (Arghode et al., 2018).

Technology makes media and learning material accessible (Ong et al., 2021); facilitates enquiry-based learning; facilitates communication and collaboration (Ghani & Daud, 2018); facilitates self-directed knowledge construction (Hamzah et al., 2022; Mulyati et al., 2020; Ratheeswari, 2018; Ridwan et al., 2020); assesses learning and mastery; develops career and life skills and improves digital literacy (Ridwan et al., 2020; Risdianto, 2018; Schweighofer et al., 2019).

There are many benefits and disadvantages to both contact (F2F)-, computer integrated- and online learning. Neither of the three methods offer the perfect stand-alone solution to training and development. Teachers should adapt their teaching methods to meet students' learning needs (Raza et al., 2020). The researcher compares various aspects of teacher-participant interaction during F2F learning and online learning. The researcher includes a summary of the characteristics, advantages, and disadvantages of both methods of instruction.

3.9.2 Contact (F2F) learning courses

A tried and tested method of CPD is F2F expert-led training (Ismail & Jaafar, 2022). The advantages of contact instruction are that it offers a platform for rich verbal discussions, since the instructor has greater control and cannot easily be ignored by participants (Castro & Tumibay, 2021). Contact facilitation offers certainty, since most participants know how to take part in verbal discussions (Castro & Tumibay, 2021). Immediate feedback is an important factor in student development (Spatioti et al., 2022). Immediate feedback increases the probability of early identification of learning barriers, which informs instructional decisions. Contact learning allows skilled facilitators to adapt their instructional procedures to meet students' needs (Jalinus et al., 2021; Raza et al., 2020). Immediate feedback, through contact classes, encourages rich discussions and knowledge application (Sood et al., 2020).

The disadvantages of contact instruction are rooted in the fact that discussions are limited to contact meetings (Castro & Tumibay, 2021) and implement a limiting, teacher-centred approach (Brouwer, Fleerackers, et al., 2022). Traditional teacher-centred learning often leads to surface learning (Brouwer, Fleerackers, et al., 2022). Teachers struggle to keep students' attention, and have used technology to create student interest (Yus Rama et al., 2020). This limits the time for reflection and conversation, and in essence guidance to mastery. Participation is often unequal, with some students heavily involved and others 'free-riding' (Castro & Tumibay, 2021). Participants might experience stress or anxiety at meetings (Castro & Tumibay, 2021).

Feedback, an essential part of learning, cannot be done as frequently on an individual level as is possible with online learning. There is also no permanent record of frequent feedback with contact facilitation (Castro & Tumibay, 2021).

3.9.3 Online learning courses

Online learning refers to the use of technology and cloud computing (Hashim, 2018) to facilitate learning and development in a synchronous, asynchronous, or blended learning environment (Martin et al., 2017; Ross, 2022; Singh & Thurman, 2019). Asynchronous learning enables CPD, through structured learning programmes, at the user's own time and pace (Merriam & Baumgartner, 2020; Sayed, 2018).

Online learning is associated with integration of learning with the world wide web (Risdianto, 2018; Sayiner & Ergönül, 2021; Serevina & Meyputri, 2021). Online learning enables storage and collection of information in the form of webpages (Risdianto, 2018; Salas et al., 2020; Serevina & Meyputri, 2021), which can be used for delivery or to solicit learner interaction (Serevina &

Meyputri, 2021). Modern, web-based education platforms are designed to increase interactivity by adapting to the learner (Chang & Wei, 2016; Singh & Thurman, 2019).

There are many benefits to online- and web-based learning. Web-based learning can support learner engagement on multiple dimensions, including behavioural, emotional, and cognitive engagement, which increase learner engagement and learning efficacy (Schindler et al., 2017). Online content and discussions leave a permanent digital interaction trail (Castro & Tumibay, 2021; Sayiner & Ergönül, 2021), which increases access to content and learning opportunities (Castro & Tumibay, 2021; Mamun et al., 2020; Setswe et al., 2019). 24-hour access to information, enabled by online learning, is one of the greatest assets of blended learning programmes (Kolcu et al., 2020; Sayiner & Ergönül, 2021). Online learning allows greater use of supporting multimedia, which drives student motivation and interest (Ghani & Daud, 2018; Spatioti et al., 2022). Digital tools, such as web-conferencing software, blogs, wikis, social networking sites, digital games (Schindler et al., 2017) and gamification (Chang & Wei, 2016; Hashim, 2018; Sözcü et al., 2013) encourage collaboration and interaction (Ghani & Daud, 2018) and strengthen communication (Sayiner & Ergönül, 2021). Participants form an online community of learning (Diep et al., 2019; Naidoo et al., 2021) which can contribute to CPD (Setswe et al., 2019). Learners can engage content beyond the restrictions of the traditional class setting (Chang & Wei, 2016), engage in higher-order thinking and achieve deeper understanding (Schindler et al., 2017).

According to Castro and Tumibay (2021), students experience less anxiety in blended learning courses than with contact classes, and participate more equally. Online learning offers individual, focused feedback (Mahardhika et al., 2023), while students have a permanent record of the feedback they received (Castro & Tumibay, 2021).

The disadvantages of online learning include the lack of in-person engagement between participants and facilitators (Sayiner & Ergönül, 2021; Sood et al., 2020). Online learning can, at times, make students feel disengaged (Arghode et al., 2018; Naidoo et al., 2021). Online learning inhibits facilitators from observing non-verbal communication, such as facial expressions, reducing the effectiveness of feedback during verbal teaching and discussions (Naidoo et al., 2021). Students report feeling anxiety about verbalising their learning gaps in online learning courses (Naidoo et al., 2021).

Online and distance learning environments can make design and implementation of the nine learning events difficult, because of the absence of an ever-present, engaging facilitator (Hodell, 2021). It is easier for participants to ignore instructors than with contact facilitation (Arghode et

al., 2018; Hodell, 2021). Text-based discussions are often either dense and time-consuming to read through, or limited when compared to contact discussions (Castro & Tumibay, 2021). Though feedback is more individualised, feedback is delayed and is less likely to draw out a discussion (Castro & Tumibay, 2021).

Online learning is dependent on access to software and hardware resources such as Wi-Fi, smartphones, tablets, internet tools, social software, and online course resources (Yao, 2021). Online learning is therefore not accessible to everyone, especially in developing countries like South Africa (Maddock & Maroun, 2018; Mlachila & Moelets, 2019; Mlambo, 2018; van der Berg, 2008)

3.9.4 Mobile learning

Mobile learning is a special form of blended learning (Suartama et al., 2019) which uses mobile devices, wireless networks and mobile networks to enable learning (Hashim, 2018; Setswe et al., 2019; Shin & Kang, 2015; Suartama et al., 2019). Mobility is a prominent attribute of the digital era and will likely shape the future of education (Setswe et al., 2019). Mobile learning unlocks new paradigms of connectivity, communication, and collaboration (Ghani & Daud, 2018; Jalinus et al., 2021; Suartama et al., 2019). It embraces learner mobility into learning programme design (Setswe et al., 2019; Suartama et al., 2019). Through mobility, flexibility and accessibility (Spatioti et al., 2022; Suartama et al., 2019), mobile learning enables collaboration and development, beyond the limitation of physical location (Hashim, 2018; Setswe et al., 2019). It enables continuous access to content and instructors (Hashim, 2018; Jalinus et al., 2021; Suartama et al., 2019).

Mobile learning allows integration of advanced multimedia tools (Spatioti et al., 2022; Suartama et al., 2019). Learning can take place through formal, structured educational platforms, such as an LMS (Hodell, 2021), as well as informal, social media platforms such as WhatsApp, Facebook or Twitter (Setswe et al., 2019; Spatioti et al., 2022).

3.9.5 Content development in blended learning programmes

Traditional content development is time-consuming and expensive (Bonk, 2009; McHaney, 2011). It also limits the learners' access to information to the learners' direct environment and resources (Bonk, 2009). Content development and facilitation has, however, changed dramatically from a teacher and textbook dependence to teacher empowerment and universal access to information (Bonk, 2009; Chang & Wei, 2016).

Technology has opened a new world of content development and engagement through smart devices and the World Wide Web (Bonk, 2009; Chang & Wei, 2016; Schindler, 2017). The internet offers access to an almost inexhaustible source of information (McHaney, 2011).

LMSs have become prominent systems of content development and presentation (Hodell, 2021) and are discussed in section 3.8.6.

3.9.6 Learning Management Systems

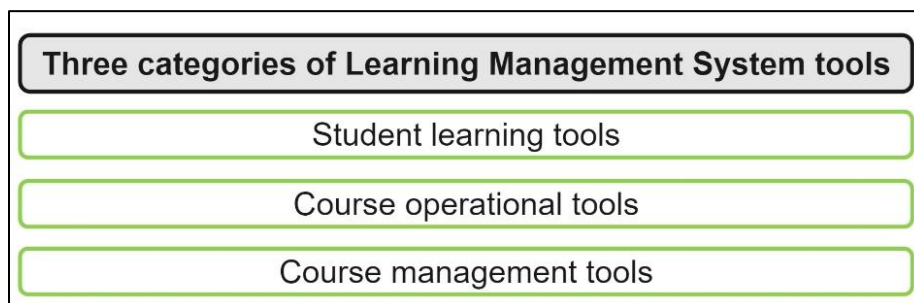
An LMS is a software interface serving as the foundational structure that coordinates every aspect of online learning (Hodell, 2021). LMSs can be used to perform activities associated with every phase of the ADDIE Model of Instructional design. LMSs allow management of course structure, course content, assessment, and reporting (Altinpulluk & Kesim, 2021). LMS infrastructure systems enable upload, storage, access, and transmission of learning material (Ghani & Daud, 2018).

An LMS enables synchronous and asynchronous teaching and learning (Goodson & Nilson, 2017; Jalinus et al., 2021; Sayiner & Ergönül, 2021). LMSs have transformed traditional F2F education by enabling blended- and online learning facilitation (Beer, 2010; de Porto Alegre Muniz & de Moraes, 2012) through delivery, tracking and management learning material (Islam, 2015).

LMSs have boosted mobile learning and increased universal access to learning opportunities. Smart devices have enabled global learning and collaboration (Ong et al., 2021), leading to a surge in mobile e-learning adoption (Sözcü et al., 2013). Smart mobile device adoption is at its highest level in history and is expected to continue to increase as technology becomes more accessible in coming years (Schindler et al., 2017).

LMSs offer a wide range of tools that can be used to optimise blended learning programmes. The elements of an LMS can be divided into three categories, illustrated in Figure 3.63.

Figure 3.63
Elements of Learning Management Systems



Source: Adapted from Hodell (2021)

The three categories of LMS tools include (1) student learning tools; (2) course operational tools and; (3) course management tools (Hodell, 2021). A brief description of each category and its functionalities follows.

A) Student learning tools

Student learning tools are largely associated with the ADDIE Implementation phase and used to facilitate learning and development. Student learning tools are primarily planned, designed and organised by designers and facilitators, but students can also collaborate to create student learning tools and environments themselves (Goodson & Nilson, 2017).

Student learning tools can be divided in to three sub-categories, namely (1) content engagement tools; (2) communication tools; and (3) collaboration tools (Hodell, 2021). *Content engagement tools* enable online publication of learning material, assignments, and study notes (Mahardhika et al., 2023; Yus Rama et al., 2020). These tools make instructional material accessible anytime, anywhere (Ghani & Daud, 2018; Naidoo et al., 2021). Content engagement tools include a syllabus, materials, discussion boards and glossary-builder (Goodson & Nilson, 2017; Hodell, 2021). Table 12, Appendix B illustrates the LMS content engagement tools with a description of each. *Communication tools* are used to create an online community of learning. Communication tools can be used to remind students of upcoming events and intended learning objectives (Naidoo et al., 2021). Online access to learning material and communication tools enable students to engage with content, peers, and facilitator, both inside and outside the classroom (Jalinus et al., 2021). Table 13, Appendix B illustrates the LMS communication tools with a description of each. *Collaboration tools* encourage student–facilitator and peer collaboration, which contributes to learning and development (Goodson & Nilson, 2017). Table 14, Appendix B illustrates the LMS collaboration tools with a description of each.

B) Course operational tools

Course operational tools should make content- and learning engagement as easy as possible (Sweller et al., 2019). Operational tools include navigation tools and student support pages (Hodell, 2021; Sweller et al., 2019). Table 15, Appendix B illustrates three course operational tools, along with their functionalities.

C) Course management tools

Course management is largely unseen by learners and mostly only available to designers, facilitators or course administrators (Hodell, 2021). Course management tools include course settings (such as look and feel; course term length); enrolment; grading; evaluation of

participation; and learning tool availability (Hodell, 2021). Table 16, Appendix B outlines the most prominent LMS course management tools and their functionalities.

Using an LMS to conduct online assessments. An LMS can be used for formative and summative evaluation of learning. An LMS can be used to perform online assessments (Yus Rama et al., 2020). For formative assessment, a designer can conclude each lesson or unit with a set of questions, prompted by the LMS, which evaluates mastery of the desired learning objectives.

LMSs allow assessment and feedback through a stimulus reaction process, associated with the behaviourism learning theory (Jalinus et al., 2021). Learner progress is monitored through online metrics, and either rewarded or corrected, with feedback provided on participant responses. LMSs enable student motivation through awarding micro-credentials and digital badges which recognise and award achievement (Flynn et al., 2023). Digital badges are largely available online and can be used to convey attainment of learning outcomes, skill acquisition and academic achievement (Flynn et al., 2023).

Through user profiles, an LMS can personalise learning to enable direct teacher–learner feedback (Yus Rama et al., 2020) and alter a participant’s learning path. An LMS can directly control the material that participants see next (Day, 2016). Correct responses would allow access to the subsequent unit (Day, 2016). Incorrect responses would lead the participant to revisit relevant material (first order branch), or open material which further clarifies the learning barrier (second order branch), before returning to the question for a second attempt at responding to the question (Day, 2016).

LMS adaptive user interface. One of the most important aspects of an LMS is an adaptive user interface (Hodell, 2021). Course design should facilitate development of new schemata (Klepsch & Seufert, 2020). Designs should be kept simple. One should focus the cognitive load on addressing the problem and learning new skills (Klepsch & Seufert, 2020).

Goodson and Nilson (2017) suggest an online course development checklist which includes key user interface remarks. Table 17, Appendix B illustrates an overview of Goodson and Nilson (2017) checklist for course design when using an LMS. Adnan and Ritzhaupt (2018) suggest seven software design elements which ought to be considered for 21st century ID. Table 18, Appendix B describes seven software design principles by Adnan and Ritzhaupt (2018), along with their application to the field of ID.

3.9.7 The ‘human’ role in learning

Interpersonal relationships play an important role in learning and development (Naidoo et al., 2021; Spatioti et al., 2022). Facilitators should develop quality interpersonal engagement with course participants (Sayiner & Ergönül, 2021), whether the course takes place in an online, blended or in-person training environment (Arghode et al., 2018). Students report that learning with peers is helpful. Designers design for collaboration and avoid isolating participants (Arghode et al., 2018).

The quality of interpersonal relationships directly correlates with learner grades (Arghode et al., 2018). A teachers’ social and cognitive presence has a direct correlation with course completion rates (Brouwer, Fleerackers, et al., 2022). Participants are motivated when facilitators are motivated (Kolcu et al., 2020). Immediate feedback and frequent communication drives motivation and participation (Spatioti et al., 2022). Collaboration on cognitively-demanding tasks reduces stress (Sweller et al., 2019) by enabling a larger combined working memory. In blended learning, the role of the ‘teacher’ shifts from instructor to observant facilitator (Jalinus et al., 2021; Ridwan et al., 2020; Sayiner & Ergönül, 2021). Blended learning enables the participant and facilitator to spend the majority of their cognitive load on solving problems and identifying and correcting learning barriers through facilitator feedback (Ridwan et al., 2020).

Various methods for building interpersonal connection through online media are available (Jalinus et al., 2021). An educator (facilitator) can develop interpersonal relationships through frequent online communication (Naidoo et al., 2021), such as informative posts, sharing encouraging messages, asking open questions, responding quickly to learner queries, and expression of care through regular progress check-ins and interaction through online discussion boards (Arghode et

al., 2018; Brouwer, Fleerackers, et al., 2022). Interpersonal relations can be boosted by setting up small work groups rather than large groups (Arghode et al., 2018; Hashim, 2018).

3.9.8 Conclusion: Blended learning programmes

Blended learning is the most appropriate approach to meet the needs of a global education movement (Naidoo et al., 2021; Nugraha et al., 2022; Spatioti et al., 2022; Yus Rama et al., 2020) due to its flexibility and convenience (Hashim, 2018; Nugraha et al., 2022; Spatioti et al., 2022). Blended learning yields more positive academic results than purely online learning programmes (Sood et al., 2020; Yus Rama et al., 2020). The flipped classroom approach yields higher educational participation (Hashim, 2018) and motivation compared to traditional approaches (Sayiner & Ergönül, 2021), but online learning cannot replace F2F learning (Spatioti et al., 2022).

Blended learning offers designers the opportunity to design courses such that facilitators can reap the benefits of both online and F2F instruction (Shakeel et al., 2022; Sözcü et al., 2013; Spatioti et al., 2022; Yao, 2021). Blended learning enables new, innovative teaching methods which are unavailable in F2F instruction (Ridwan et al., 2020). Blended learning is a popular method of professional development and management training (Hamzah et al., 2022) because it enables flexible access to CPD anytime and anywhere (Arisanti et al., 2019; Kolcu et al., 2020). Blended learning acknowledges that learning takes place inside (formal learning) and outside (informal learning) of the classroom (Purwani & Dewi, 2021; Suartama et al., 2019). It enables learners to access content anywhere, at their own pace and time (Jalinus et al., 2021; Mulyati et al., 2020; Risdianto, 2018; Sayiner & Ergönül, 2021), while enjoying access to peer and facilitator collaboration (Hashim, 2018; Jalinus et al., 2021), in a structured or unstructured environment (Hamzah et al., 2022; Ridwan et al., 2020; Shakeel et al., 2022).

Through blended learning, designers can combine F2F interaction, various media types (e.g., printed text, audio, video), e-learning technology and the internet to organise design and drive innovation (Ridwan et al., 2020; Serevina & Meyputri, 2021).

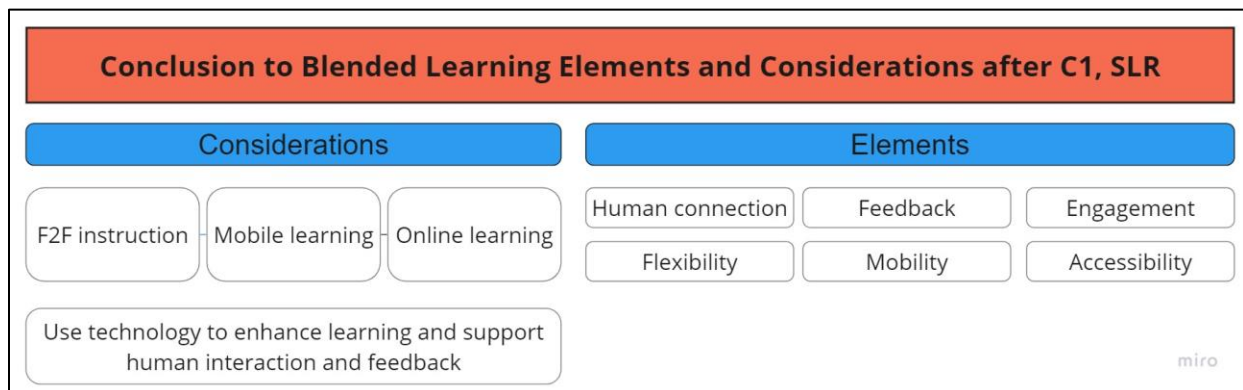
The advantages of blended learning are countless. Blended learning improves mastery of learning outcomes (Hamzah et al., 2022; Mulyati et al., 2020; Risdianto, 2018; Sood et al., 2020); actively involves every student in the knowledge construction process (Ridwan et al., 2020; Suartama et al., 2019), by drawing on various sources (textbooks, videos, social media, journals, etc.) (Jalinus et al., 2021); increases student participation and achievement (Mulyati et al., 2020; Suartama et al., 2019); is more flexible and accessible than F2F instruction (Irawan et al., 2020; Jalinus et al., 2021; Ridwan et al., 2020; Risdianto, 2018; Serevina & Meyputri, 2021); increases collaboration;

provides a more individualised learning experience (Hashim, 2018; Mahardhika et al., 2023); provides the opportunity to practise beyond the classroom; and develops 21st century skills (Mulyati et al., 2020; Ridwan et al., 2020).

It is, however, important to recognise that poorly designed blended and mobile learning programmes can lead to cognitive overload (Suartama et al., 2019). It is therefore essential that designers and facilitators meticulously plan and execute blended learning programmes.

Figure 3.64 illustrates the considerations and elements established as findings and results for Cycle 1, SLR.

Figure 3.64
Conclusion to Blended Learning elements (Cycle 1)



Source: The researcher

Four considerations of blended learning emerge after Cycle 1, SLR. Blended learning is a combination of F2F instruction, mobile learning, and online learning. The designer needs to consider which approach should weigh more during implementation, depending on the NOP analysis. The designer should also consider how technology integration can enhance learning, interaction and feedback, and plan integration accordingly. Six elements of blended learning emerge. These elements are seen as essential to the success of a course.

The researcher has completed the DBR Conceive phase through the write-up of Cycle 1. In section 3.9, the researcher presents the findings to Cycle 1, SLR in the DBR Build Phase.

3.10 BUILD: Results, Conclusion (Cycle 1, SLR)

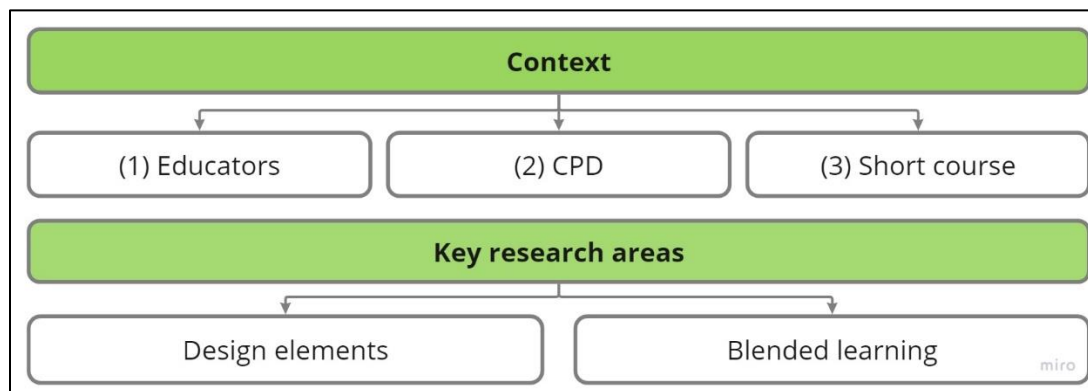
In this section, the researcher concludes Chapter 3 by addressing the findings of the first sub-research question:

First sub-research question:

What are the design elements of a blended CPD short course for educators according to the findings of a Systematic Literature Review?

Figure 3.65 illustrates the context and key research areas for this study.

Figure 3.65
Context and key research elements for the study



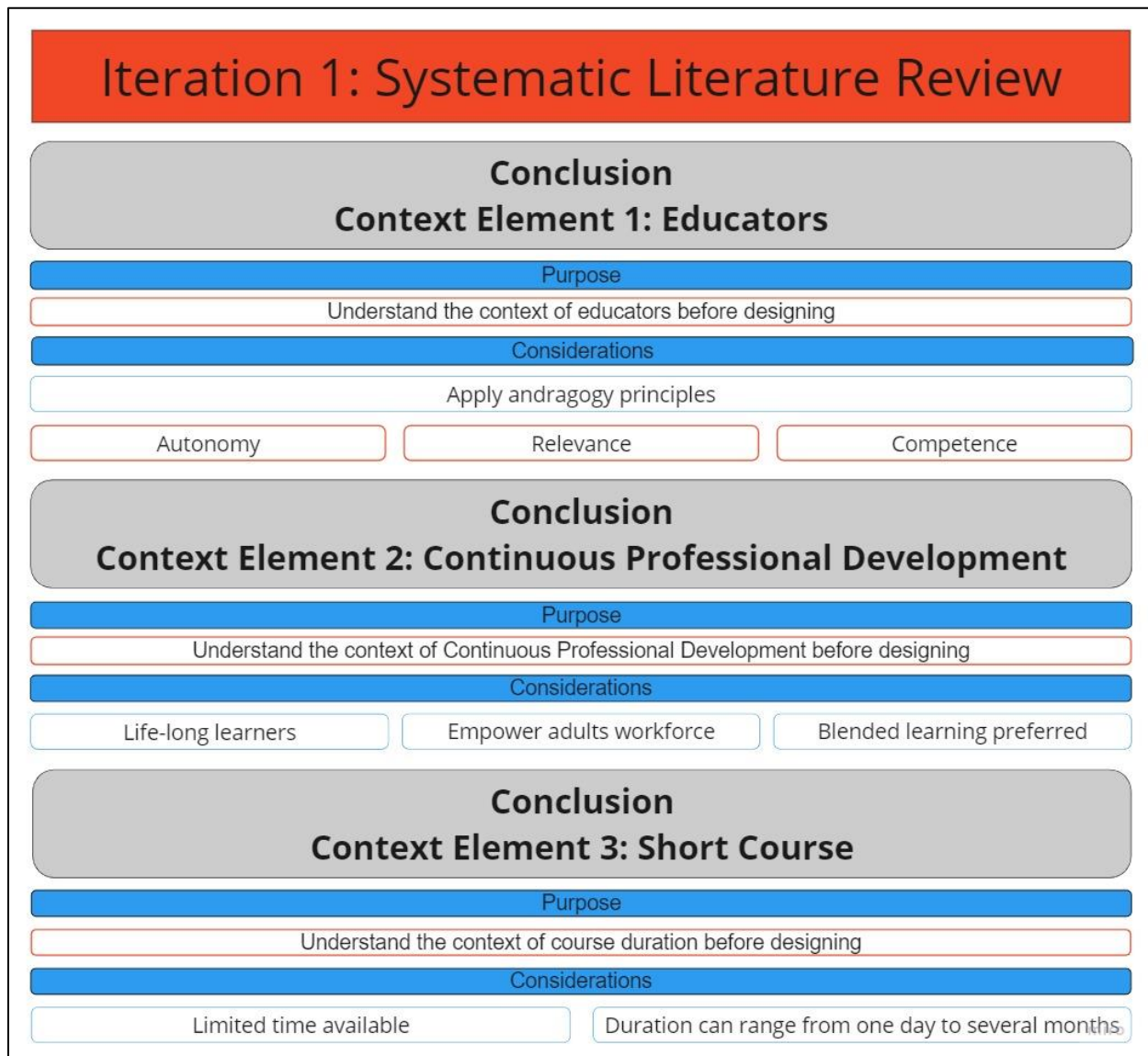
Source: The researcher

This study was performed in the context of educators participating in short CPD programmes. The researcher focused on two key research areas, namely, blended learning and design elements. Upon conclusion of Cycle 1, SLR, the elements and considerations for designing blended CPD short courses for educators are presented.

Firstly, a designer must understand how adults learn, considering the context of a learning programme for educators. *Secondly*, designers must implement a tried and tested ID model, such as the ADDIE Model of ID. ID model application should be iterative. Evaluation should assess mastery and improve course design. *Thirdly*, blended learning, which includes online- and mobile learning, is emerging as the prominent and most likely method of teaching and learning for current and future learning programmes. Designers must ensure that blended learning programmes promote human interaction, provide regular feedback, use active learning, and are flexible, mobile and accessible.

The SLR ascertained that there is a need for access to CPD opportunities. CPD needs to acknowledge that participating in CPD programmes mostly takes place concurrently with other work obligations. Designers therefore must apply the six principles of andragogy (adult learning), and leverage the power of blended-, online-, and mobile learning to meet the needs of the participants. The findings of the SLR are illustrated in Figure 3.66 (context) and 3.67 (design elements and blended learning).

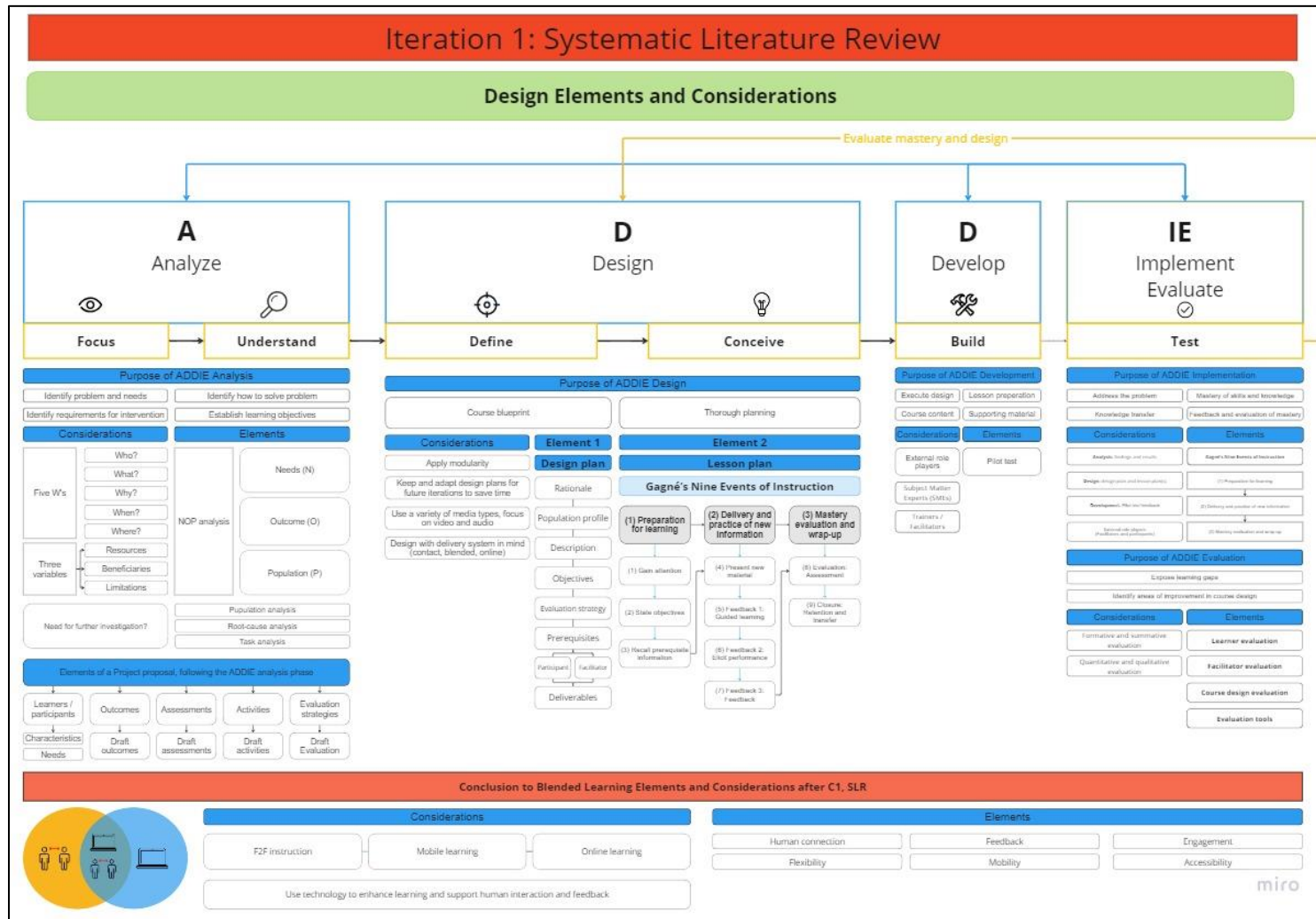
Figure 3.66
Conclusion to cycles 1, SLR, Context 1 - 3



Source: The researcher

The purpose and considerations induced through Cycle 1, Chapter 3 are presented in Figure 3.67.

Figure 3.67
Conclusion to cycles 1, SLR.



Source: The researcher

The purpose, considerations and elements of the ADDIE design phase and Blended learning, as induced through Cycle 1, Chapter 3 are presented by Figure 3.67

Chapter 4: (TEST Cycle 1) Elements from an existing course

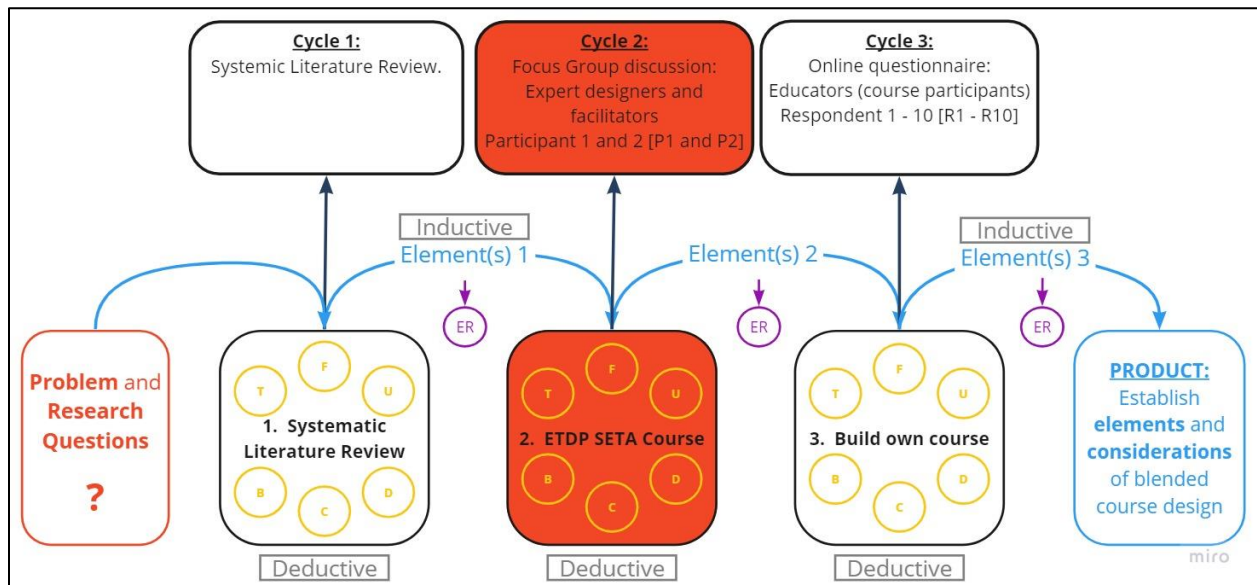
In this chapter, the researcher induces a broadened and updated set of elements and considerations of blended CPD short course design for educators. The findings of Chapter 4 are induced from the perspective of experienced course presenters, and draws on a real-world course, which was implemented in 2021. Chapter 4 addresses the second sub-research question.

Second sub-research question:
What are the design elements of an existing blended CPD short course for educators?

4.1 Introduction

Cycle 2 of the study draws on the expertise of professional blended learning programme designers to establish the **elements and considerations of blended continuous professional development short course design for educators**. The qualitative dataset for Cycle 2 consists of an online focus group discussion with two experienced course designers from a higher education institution in South Africa. Figure 4.1 illustrates the positioning of Chapter 4, Cycle 2, in the study.

Figure 4. 1
Cycle 2, ETDP SETA Course



Source: The researcher

Chapter 4 presents Cycle 2, ETDP SETA. Chapter 3 follows on from Cycle 1, SLR. In Cycle 2, the elements and considerations induced in Cycle 1 were tested for confirmation and expanded through a focus group discussion with two experienced course designers. Data collected and analysed in Cycle 2 were used to identify and confirm existing and identify emerging themes. A combination of existing (Cycle 1) and emerging themes (Cycle 2) form a revised set of elements and considerations of blended CPD short course design for educators. Table 4.1 presents the alignment of Chapter 4 with the Easterday et al. (2014) DBR process.

Table 4.1
DBR process applied to Cycle 2

DBR	Focus	Understand	Define	Conceive	Build	Test
C2	Specify the audience, problem, and constraints in Cycle 2.	Understand the context of the participants and design in C2 by gathering information through the data collection process.	The purpose of C2 is to establish the updated set of design elements (E2) by gathering information from two experienced course designers.	Since C2 has already taken place in 2021, make notes on the intended course, as recalled by the instructional designers prior to course commencement.	Course was built and implemented in 2021. Gather data about the course design elements to establish the updated set of elements (E2).	Apply the updated set of elements (E1 and E2) to a new iteration in Cycle 3 (C3), Chapter 5.

4.2 Focus

Focus

Specify the audience, problem, and constraints in Cycle 2.

In Cycle 2, the data source shifts from published literature to experienced course designers from a higher education institution in South Africa. The course included in Cycle 2 was designed for educators and implemented through a combination of contact-and online engagements, with the intention of facilitating professional development over a short period of time.

The course was presented with limited in-person implementation by request of the client. The course also took place during the COVID-19 pandemic in 2021. The designers did have the opportunity to 'meet-and-greet' the participants and assist with introduction and setup but relied largely on online course implementation and evaluation.

4.3 Understand

Understand

Understand the context of the participants and design in Cycle 2 by gathering information through the data collection process.

In the Understand phase, the context of the participants and design in Cycle 2 is discovered and analysed from the qualitative data obtained through a focus group discussion. Two expert course designers were involved as participants in the focus group discussion in Cycle 2, presented in Table 4.2.

Table 4.2
Cycle 2 Participants: Focus Group discussion

Focus group discussion		
Description	Role	Institution
Participant 1	Expert course designer	Higer Education institution
Participant 2	Expert course designer	Higer Education institution

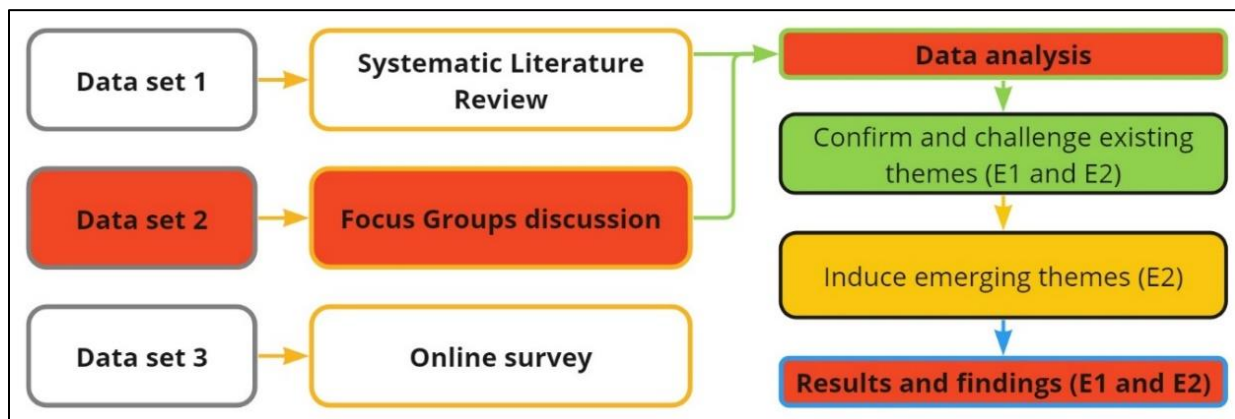
The researcher drew on the elements and considerations that were induced from Chapter 1 to set up focus group questions for an online focus group discussion with two expert course designers. A set of questions was developed to guide the conversation for the research context and research focus areas. The researcher used a questionnaire, available in Appendix C, C3. Focus group questions were used to guide the discussion, while participants participated in the discussion by responding to the questions. The researcher kept the Miro mind map of elements and considerations from Cycle 1 open on his computer and highlighted current themes as they arose. Emerging themes were added to the map after further discussion. The questions used to guide the focus group discussion are available in Appendix C, Cycle 2 Focus Group questions.

In 2021, Participant 1 (P1) and Participant 2 (P2) designed an online course for 500 subject and curriculum advisors working for the DBE in Limpopo, South Africa. The expert designers were approached by the Limpopo Department of Basic Education (LDBE) to design and develop an online learning programme to facilitate development of ICT skills in education for the group of 500 delegates. “They were looking for somebody that can train subject advisors in the use of educational technology” (P1). The designers were approached by a client to design and facilitate the course. “Either we identify the client that needs a short course, or they (the business arm of the University) let us know about it” (P1).

4.4 Define

The purpose of Cycle 2 is to establish a revised set of design elements and considerations (E2) of blended CPD short course design for educators. Themes, or considerations and elements which emerged in Cycle 1, are tested in Cycle 2 for support or opposition by research data in Cycle 2. Themes are analysed for confirmation and marked using colour-coding throughout Chapters 4 to 6 as described in Chapter 2.10. The data analysis process for Cycle 2 is presented in Figure 4.2.

Figure 4.2
Research Cycle 2 (Cycle 2)



Source: The researcher

The revised set of elements and considerations is established by combining the existing themes from Chapter 3 with emerging themes from Chapter 4.

4.5 Conceive

During the Conceive phase, the researcher analyses the data collected about the context of the participants (context 1, educators), the nature and intention of the course (context 2, CPD) and lastly the context of the course duration (context 3, short course) for the course being addressed in Cycle 2 of the study.

The course, discussed in the focus group discussion, took place from August to November of 2021. The researcher performed analysis of the qualitative data, collected through the focus group discussion to conceive the context of the study. Following this section, the researcher addresses the two research focus areas, namely design elements (focus area 1) and blended learning (focus area 2).

In this section, the researcher identifies current and emerging themes for each section addressed in the SLR. Current and emerging themes are combined to form a revised set of design elements and considerations, which the researcher will draw on when performing cycle 3 of the study. For each section, themes and considerations from Cycle 1 are presented, followed by a discussion of current and emerging themes. The reader is reminded to revisit the data analysis process described in Chapter 2, section 2.10 for the use of colour codes in mind maps to illustrate unaddressed (transparent); confirmed current (green); emerging (orange); adapted (red) and critical (red border) themes. Updated figures with current and emerging themes are presented at the end of each section throughout Chapter 4.

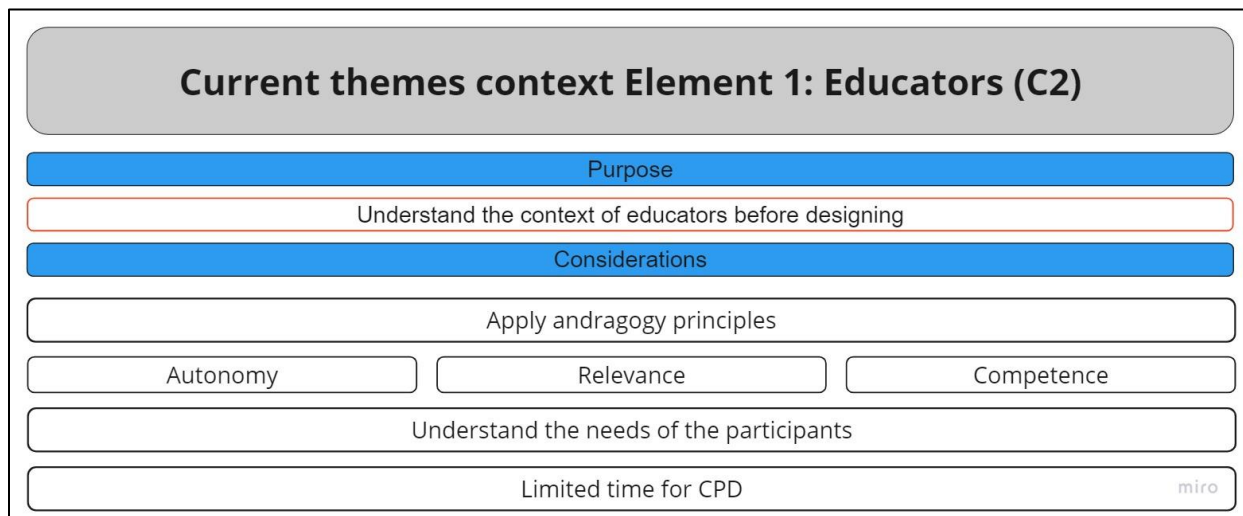
4.5.1 Context: Educators

In this section, the researcher addresses Context Element 1: Educators. A discussion on the current and emerging themes of the context of educators follows. The current and emerging themes are combined to draw a conclusion on the current and emerging themes of Context Element 1: Educators, based on the findings and results of Cycle 2.

4.5.1.1 Educators: Current themes

Figure 4.3 illustrates the current considerations and elements of Context Element 1: Educators after Cycle 1. Following Figure 4.3, the researcher presents the analysis and findings of the focus group discussion (Cycle 2) to establish current themes and emerging themes.

Figure 4.3
Current themes for Context Element 1 (Cycle 1)



Source: The researcher

Understanding the context of the course participants as educators was established as the first current theme for the context of educators. “These people were already decided upon, and the context was already placed there. We just had to adapt to it” (P2). The educators in this course were 500 qualified teachers (P2) who served as subject and curriculum advisors (P1 and P2). “They have some experiences and that we need to develop them beyond those experiences” (P2). Secondly, designers need to apply the principles of andragogy when presenting a course for adults. “Adults have other jobs (which) makes a big difference” (P1 and P2). “We had to build on thinking that they have some experiences and that we need to develop them beyond those experiences” (P2). “We expect all people in our short courses, to be an expert in something” (P1). “It comes down to bringing their expertise into an integrated realm” (P2). “It (the course) was consciously designed to bring their expertise in but allow for them to learn with each other” (P1).

The designers need to understand the needs of the participants. “You are going to have to be open to some flexibility” (P2); this was stated since participants’ work-situation could change mid-course (P2). Lastly, participants have limited time to participate in CPD courses. “You need to remember these people have full and complex lives beyond this short course. They must do things in their own time” (P1). “There's only so much time that you are given to work with people so you have to see what you can really meaningfully do in that time” (P1).

Though all considerations were confirmed during the focus group discussion in Cycle 2, additional considerations emerged for the context of educators. These considerations are discussed in 4.5.1.2.

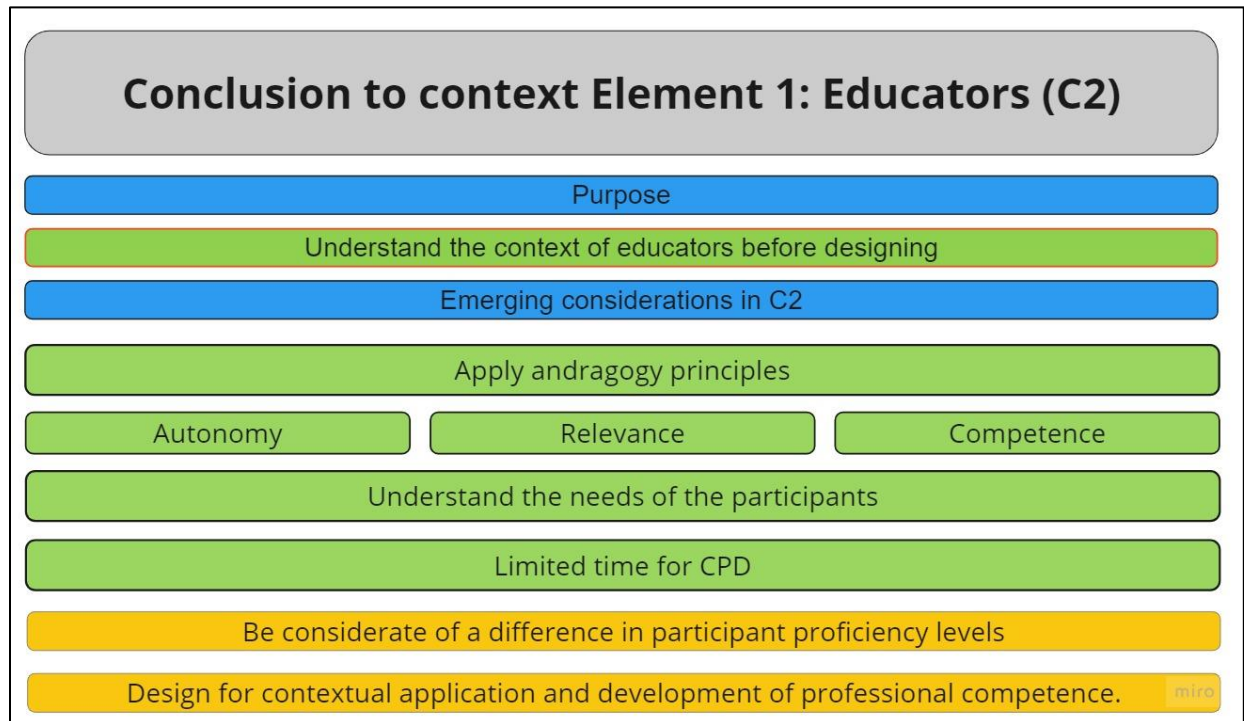
4.5.1.2 Educators: Emerging themes

Two considerations emerged when discussing the context of educators in Cycle 2. Firstly, the designer must consider that significant differences in proficiency levels might manifest within the participating group. “Some of these people were inexperienced in technology (integration in education). It was a whole range of different experiences” (P1). “You have to pitch the course in such a way that everybody feels they get something out of it” (P1). Secondly, the participants encouraged designing a course for contextualised application in the workplace. “Find out about (their work) context and design something that they can use and develop in their work” (P1). “Make it real. Make sure that what they are doing fits into their job” (P2).

4.5.1.3 Educators: Conclusion

The confirmed current themes, as well as emerging themes, are illustrated in Figure 4.4.

Figure 4.4
Conclusion to Context Element 1 (Cycle 2)



Source: The researcher

The purpose and six considerations from Cycle 1 were confirmed (green) by the discussion in Cycle 2. Current themes were discussed in 4.5.1.1. Two considerations (orange) emerged in Cycle 2, section 4.5.1.2. A discussion on Context Element 2: CPD, including the current themes, emerging themes and conclusion follows.

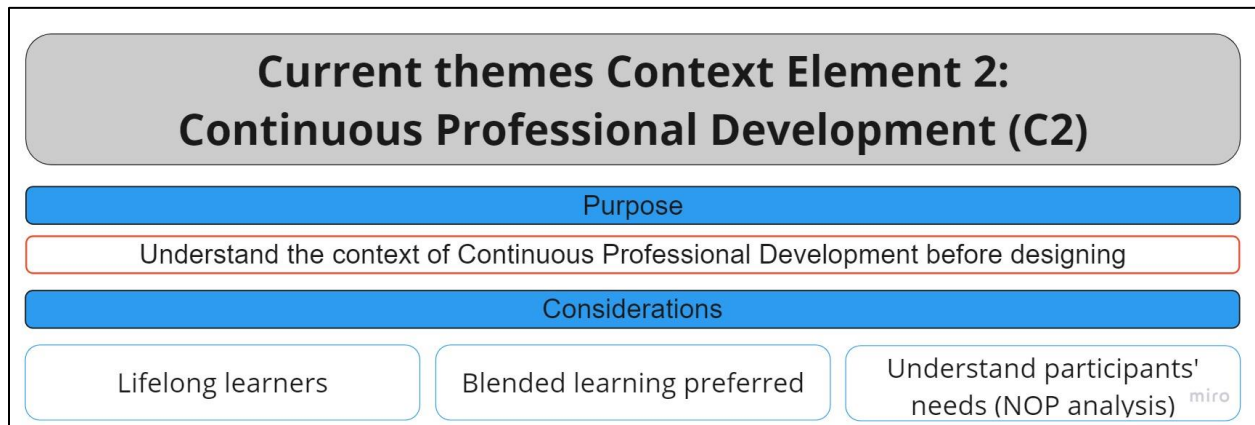
4.5.2 Context: Continuous Professional Development

In this section, the researcher addresses Context Element 2: Continuous Professional Development. A discussion on the current and emerging themes of CPD follows. The current and emerging themes are combined to draw a conclusion on the current and emerging themes of Context Element 2: CPD, based on the findings and results of Cycle 2.

4.5.2.1 CPD: Current themes

Figure 4.5 illustrates the current considerations and elements of Context Element 1: Educators after Cycle 1. Following Figure 4.5, the researcher presents the analysis and findings of the focus group discussion (Cycle 2) to establish current themes and emerging themes.

Figure 4.5
 Current themes of Context Element 2 (Cycle 1)



Source: The researcher

The purpose, and three considerations was established as current themes of Context Element 1, CPD. Firstly, the designer needs to understand the context of the CPD programme before design commences. The context of the course and participants was established (P1). “We had to adapt to that context” (P1), and had to understand what it really means “so that we can design something that they can use and develop in their work” (P1).

Three considerations were confirmed as current themes. Firstly, educators are expected to learn and develop throughout their lifetime. The participants (subject and curriculum advisors) “are responsible for teacher support and teacher’s development” (P1). Although some participants felt like they ‘had to’ participate because they were told to, others experienced that “this is taking my curriculum and subject advisory to the next level” (P2). Secondly, the designers confirmed that blended learning is preferred as an implementation method. “They wanted it to be online” (P1), but the designers still met the delegates in person before implementation commenced. “You can really do a lot with people online if you introduce them well in the beginning” (P1). By integrating technology, the delegates had more “time to think and engage with material” (P1) and “make it part of themselves” (P1). “That’s what the online element brings in; it creates time” (P1). A blended course is less expensive, and more convenient for the participants and facilitators (P1). Lastly, the designer needs to understand the needs of the participants. The participants are expected to develop other teachers (P2) and become advisors in technology integration (P2). “These people have full and complex lives beyond this short course” (P1).

4.5.2.2 CPD: Emerging themes

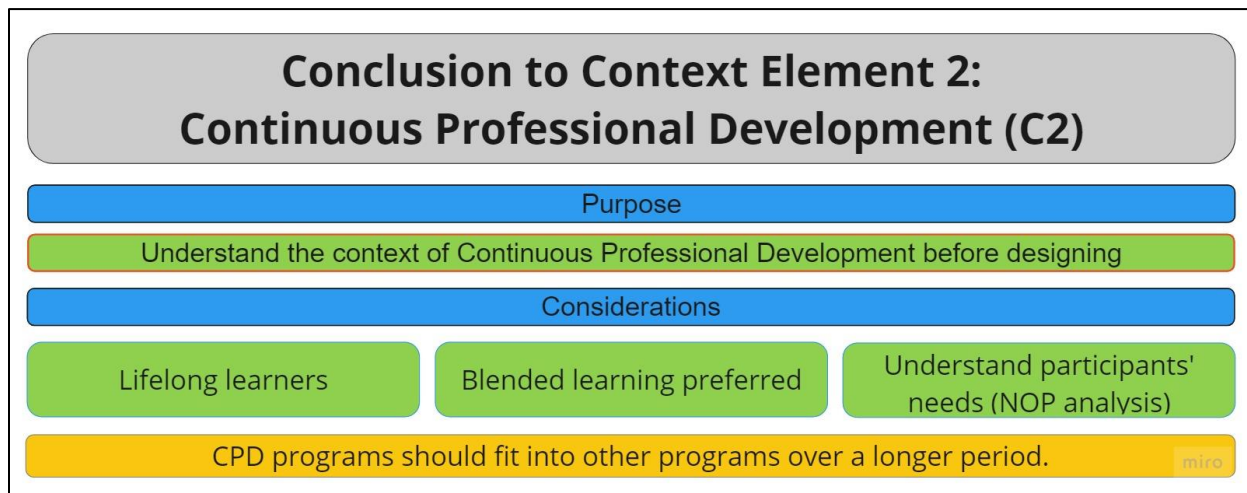
One consideration emerged as part of Context Element 2: CPD. CPD should be a continuous act of training and development. “It was 6 little topics that the people worked through, so it was almost

like 6 small professional development workshops. One workshop or one session about 1 aspect of their career” (P2). The CPD programme should fit into other programmes to facilitate continuous development (P2).

4.5.2.3 CPD: Conclusion

The current themes which were confirmed, as well as emerging themes, are illustrated in Figure 4.6.

Figure 4.6
Conclusion of Context Element 2 (Cycle 2)



Source: The researcher

The purpose and three considerations from Cycle 1 were confirmed in Cycle 2 (green). Sequential implementation of short courses which facilitate CPD over long periods of time (orange) emerged as a consideration in Cycle 2.

A discussion on Context Element 3: Short course, including the current themes, emerging themes and conclusion follows.

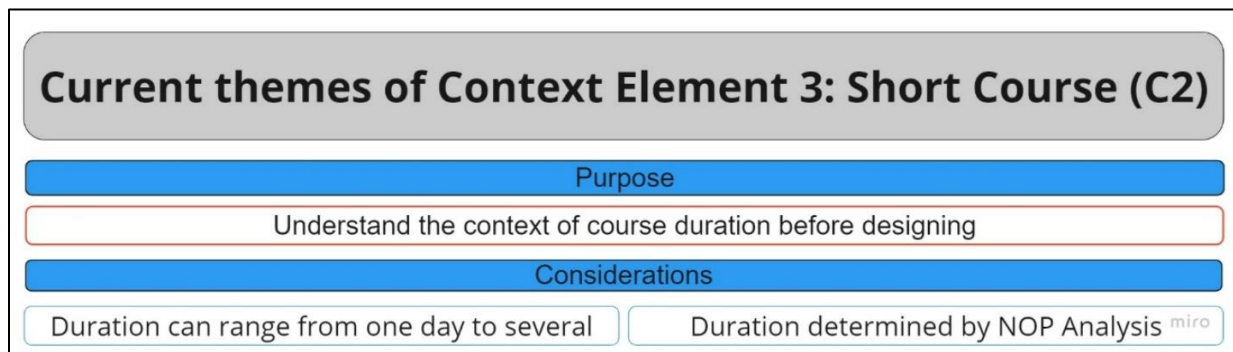
4.5.3 Context: Short course

In this section, the researcher addresses Context Element 3: Short course. A discussion on the current and emerging themes of a short course follows. The current and emerging themes are combined to draw a conclusion on the current and emerging themes of Context Element 3: Short course based on the findings and results of Cycle 2.

4.5.3.1 Short course: Current themes

Figure 4.7 illustrates the current considerations and elements of Context Element 3: Short course after Cycle 1. Following Figure 4.7, the researcher presents the analysis and findings of the focus group discussion (Cycle 2) to establish current themes and emerging themes.

Figure 4.7
Current themes of Context Element 3 (Cycle 1)



Source: The researcher

Two considerations pertaining to the context of a short course were confirmed as a current theme. Firstly, the duration of a course can vary, so long as it addresses the needs of the client and participants. If this course were presented as an F2F course, “we would have had a five-day course. Now (by doing it online) it was an eight-week course without being more expensive” (P2). Secondly, the duration of a short course should be determined by the needs of the client and participants. The clients specified when they wanted the course to start, and that it should be concluded before the end of the year (P2). Based on the requirements and course specifications, the designers consciously focused on about three months (P2) from introduction to finalising the last assignment (P1), with 8 weeks for course content implementation (P1 and P2).

4.5.3.2 Short course: Emerging themes

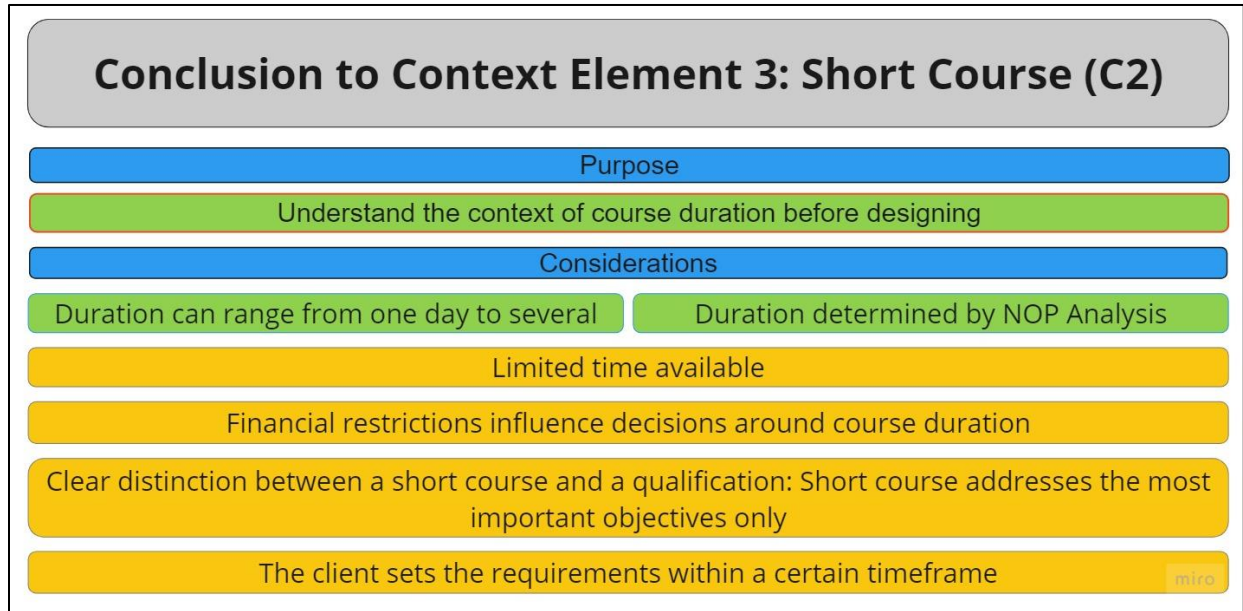
Four considerations emerged when discussing the context of short courses in Cycle 2. Emerging themes related to (1) limited time available for course implementation; (2) the client sets the requirements within a certain timeframe; (3) a clear distinction between a short course and a qualification; and lastly (4) financial restrictions influence decisions around course duration.

Firstly, (1) some clients need to meet specified objectives in a very short time, which directly influences the choice of outcomes and activities included in the course. “There's only so much time given to work with people” (P1). “You have to see what you can meaningfully do in that time” (P1). “A short course by its nature limits you to do what is (most) important” (P2). Secondly, (2) the client sets the requirements within a specified timeframe. The client mostly specifies a desired start and conclusion date for the course (P1). Thirdly, a clear distinction should be made between a short course and a qualification (P2). There are distinct differences between courses that are certified, accredited, or purely intended to facilitate mastery and application of a skill (P1). Lastly, financial restrictions influence implementation and duration decisions. “We need to keep costs in mind for the client” (P2).

4.5.3.3 Short course: Conclusion

The current themes which were confirmed, as well as emerging themes, are illustrated in Figure 4.8.

Figure 4.8
Considerations of Context Element 2 (Cycle 2)



Source: The researcher

The purpose and both considerations from Cycle 1 were confirmed in Cycle 2 (green). Four considerations emerged in Cycle 2 (orange), as presented in orange in Figure 4.8. Designers should consider limited time, resources, the nature of the short course and time-constraints specified by the client.

A discussion on the Build Phase key research elements, including Design Elements and Blended learning follows.

4.6 Build

The course was built and implemented in 2021. Data was gathered about the course design elements to induce an updated and refined second set of elements (E2).

4.6.1 Design elements

In this section, the researcher discusses the first key research area, namely design elements.

4.6.1.1 Instructional Design Model

In chapter 3, the SLR clearly stated the importance of applying an ID model and systematically designing a course. This finding was affirmed by the participants in Cycle 2 of the study. The designers made use of a clear design process.

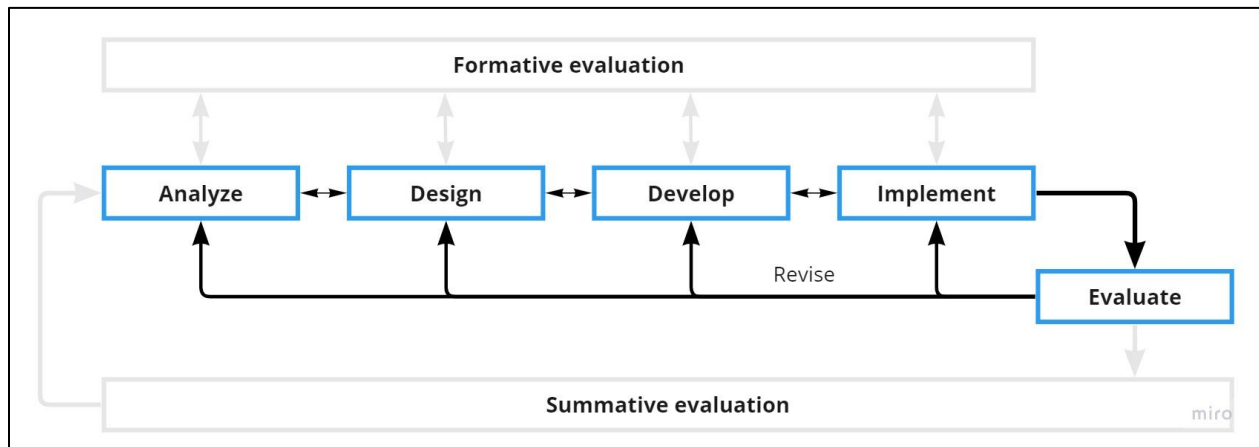
A) Instructional design model current themes.

The use of an ID model to guide the design process was solidified as an indispensable current theme. Designing and implementing a course follows a broad framework, analysing the requirements of the course (P1), and then taking participants from an initial introduction to the coursework to an assessment of learning at the end (P1).

The participants agreed that various design frameworks and models can be implemented when designing a course with the ADDIE Model providing a reliable framework for course design. “The process definitely formally includes (an ID model like) the ADDIE” (P1). It is important to consider that the ADDIE Model is one ID model among many others (as described in 3.7.2). Any reliable and relevant ID model can be used to present a course. The ADDIE Model was chosen to structure data collection and is used in the study to present findings.

Figure 4.9 illustrates an adapted ADDIE Model with the addition of summative and formative evaluation presented in Chapter 3, Figure 3. 57.

Figure 4.9
ADDIE Model of Instructional Design (Cycle 1)



Source: The researcher

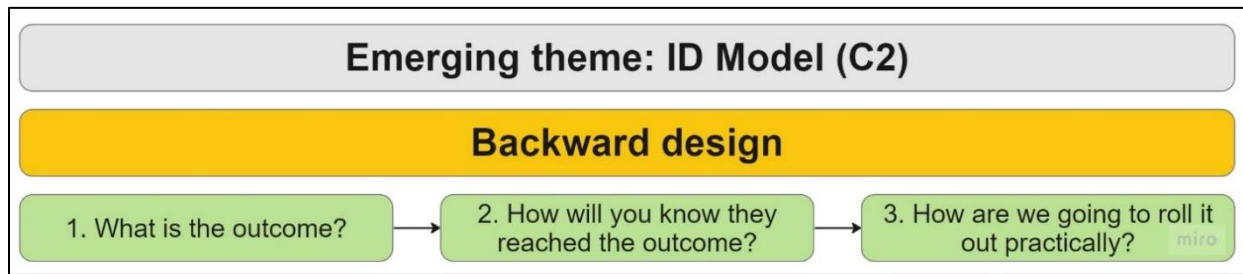
Figure 4.9 illustrates how formative and summative evaluation continuously informs the phases of the ADDIE process and design improvements for future cycles of the course, as presented in Chapter 3, section 3.7.3.5.

B) Instructional design model emerging themes

Two new design models emerged as emerging themes during the focus group discussion. The models that emerged included the Appreciative Inquiry Process (P1) and Backward Design Model (P1 and P2). “One of the most important things that we do is that backward design, whether it’s quick and dirty or we have months to plan it, the backward design is the backbone of what we do” (P2). “In my view, the backward design fits into the design part of ADDIE.” (P1). “We follow the backward design process for the actual design of the course. The backward design guides the big thinking as well as the small thinking” (P1).

The designers use backward design to guide three main events in the course. The participants start by thinking, “What is the outcome? How will you know they reached the outcome? And then we think about how we are going to roll it out practically” (considering the challenges and limitations) (P1). Figure 4.10 illustrates the backward design process as described by the participants in Cycle 2.

Figure 4. 10
Backward Design



Source: The researcher

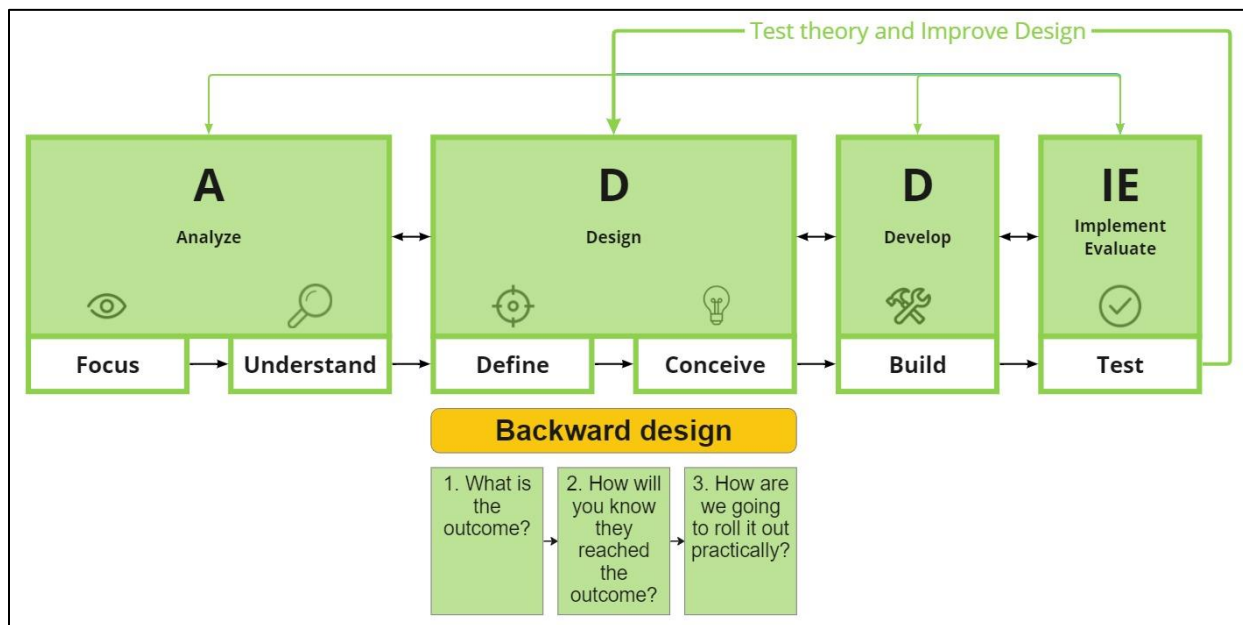
Figure 4.10 illustrates the three-phase backward design, described as the backbone of course design by expert designers in Cycle 2. The designers in Cycle 2 start by specifying the outcome; then decide how the outcome will be achieved and lastly how practical roll-out will happen through the course.

C) Instructional Design model conclusion

The current themes which were confirmed (green), as well as emerging themes from Cycle 2 (orange) are presented in 4.6.1.1 (C). The researcher finds that designers can make use of any ID model, based on the needs of the participants and course requirements. The model includes steps to address three phases as described by the backward design model, namely, (1) establishing the course outcomes; (2) determining how to obtain evidence of mastery; and (3) planning how to roll out the course practically. The purpose of using a design model is always to design a course such that there is clear alignment between the various phases of design, implementation, and evaluation (P2).

Figure 4.11 illustrates the ADDIE Model of ID, along with the three main phases of the backward design model as described by the participants in Cycle 2. According to P2, backward design fits into the ADDIE Design Phase.

Figure 4. 11
ADDIE and the Backward Design Model



Source: The researcher

Backward design emerges as a design element as part of the ADDIE Design Phase. Participants in Cycle 2 describe three phases of backward design as illustrated by Figure 4.11.

In the following paragraph, the researcher addresses each phase of the ADDIE Model of ID, by analysing current and emerging themes to draw a conclusion to the elements and considerations of design for Cycle 2.

4.6.1.2 Phase 1: Analysis

Figure 4.12 illustrates the findings of the SLR for the ADDIE Analysis Phase, as presented in Chapter 3.7.3.1 (C) Conclusion: Elements and Considerations of ADDIE Analysis. The SLR indicates designers should consider the five W's when performing analysis. Designers should focus on three elements of analysis, namely Needs, Outcomes and Population. Based on the SLR, these elements and considerations are essential for identifying the problem and needs, how to solve the problem, what is required to solve it and the establishment of learning objectives for the ADDIE Design, Development, Implementation and Evaluation Phases. According to the SLR, a project proposal should be put together following the Analysis phase. This document should outline a draft version of the participant needs and characteristics, outcomes, assessments, and learning activities.

Figure 4.12
ADDIE Analysis (Cycle 1)



Source: The researcher

Figure 4.12 presents the purpose, considerations, and elements of ADDIE Analysis, as presented as finding of ADDIE Analysis, in section 3.7.3.1 (C). In section 4.6.1.2, the researcher analyses the purpose, elements, and considerations of ADDIE Analysis, based on data gathered through Cycle 2.

A) Analysis of current themes

Participants in Cycle 2 confirmed that analysis should be performed prior to course design or commencement. The purpose of ADDIE Analysis, as well as the five W's; Needs, Outcome and Population (NOP) analysis; and a project proposal, were confirmed as clear current themes of ADDIE Analysis.

In this course, the problem, requirements, and objectives were provided by the client in the form of a brief (P2). The client specified the problem, how they wanted the designers to solve the problem, the requirements for intervention and learning objectives (P1 and P2) in the form of an extensive brief (P2). The designers were responsible for designing a course to solve the identified problem. Despite the expectations stipulated by the client, the designers made the final decision about what could realistically be done in the given time, and then started to design the course (P1).

Five considerations for ADDIE Analysis were identified in Cycle 1 and confirmed by Cycle 2. The Five W's which need to be considered when designing a course are outlined in Table 4.3, along with a quote from the focus group discussion in Cycle 2 to support the consideration.

Table 4.3
Confirmation: Five W's of ADDIE Analysis

Confirmation of the Five W's of ADDIE Analysis in C2	
Five W's of ADDIE Analysis	Quote from C2 focus group discussion
Who	"They stated they need to train 500 of these curriculum and subject advisors" (P2)
What	"They were looking for somebody that can train subject advisors in the use of educational technology" (P1).
Why	"They are curriculum and subject advisors that are, through this course, expected to become advisors of technology integration (in schools)" (P2). "Some of these people were really inexperienced in technology" (P1)
When	"Usually what you would get is they would say we want this to be done by X-date. We want this done before the end of the year starting (more or less) at this time" (P2). "We consciously focused on around 8 weeks" (P1)
Where	"They wanted it to be online" (P1). "We actually drove through to be with the participants, just to introduce the course, to get things going and then we went online from there" (P2).

Three variables were confirmed as current considerations of ADDIE Analysis, namely, resources; beneficiaries; and limitations. The designers need to consider practical limitations such as time and budget (P2). "We need to keep costs in mind for the client and you need to be reasonable in terms of the expectations placed on the participants. Don't keep them busy for too long" (P2). The client would usually specify when they want the course to start and be finished (P2). "There's only so much time that you are given to work with people, so you have to see what you can really meaningfully do in that time" (P1).

The NOP Analysis was established as the most essential element of ADDIE Analysis. The designer must have a clear understanding of the clients, or participants' needs (N). When asked about needs analysis, the designers responded that "we need to be open enough to let whatever is needed in a course, inform us on what their actual needs are" (P1). Though an extensive brief was provided to the designers (P2), the outcomes and implementation method would always be a little bit of a negotiation (P1). The needs and intended outcomes (O) also influence design decisions. "The level at which the client wanted the participants to end impacts what you do. You must pitch the course in such a way that everybody feels they get something out of it" (P1).

The objectives and outcomes (O) must be set before course design commences. When asked about the design process the participants follow, they responded that the objectives are always established first. "Firstly, it's the objective. What is it that they (the client) expect of these people once the course is done?" (P2). "I think the core things are always: What is it that they want to achieve? What's the main outcome that they want in the end and who are the people that this is for?" (P1) "They provided objectives, and we try to stick to those objectives" (P1).

The characteristics and needs of the population (P) were also clearly stipulated before design commenced. "They stated the need to train 500 curriculum and subject advisors" (P2). "These people were already decided upon, and the context was already placed there" (P2).

Lastly, it was clear that a project proposal was submitted before design commenced. A project proposal should precede design to prevent losing time on design before the course is approved. "We have a way of planning very quickly to get something to the client where they can say yes or no. Something where we feel we haven't necessarily invested a lot of time, but also, effective enough so that we have something to work with if we were to continue. Once the client says yes, then we start, and we build it out" (P2). The project proposal should not take up a lot of time, and in this case took only about 8 hours (P2).

Three elements and considerations were confirmed during the focus group discussion in Cycle 2. Only the need for further investigation was omitted in Cycle 2. The researcher induced five emerging considerations and elements which should form part of the Analysis Phase. These considerations and elements are discussed in 4.6.1.2 (B).

B) Analysis of emerging themes

Three elements emerged while discussing the ADDIE Analysis Phase. The emerging themes relate to the (1) outcomes; (2) design model (backward design) and (3) the project proposal.

Firstly, the designers were given a brief of what the course content should entail, as well as objectives, but not the outcomes that need to be met. The outcomes are set by the course designers. “They gave us the content, which they wanted in the course” (P1), but these were not necessarily the outcomes.

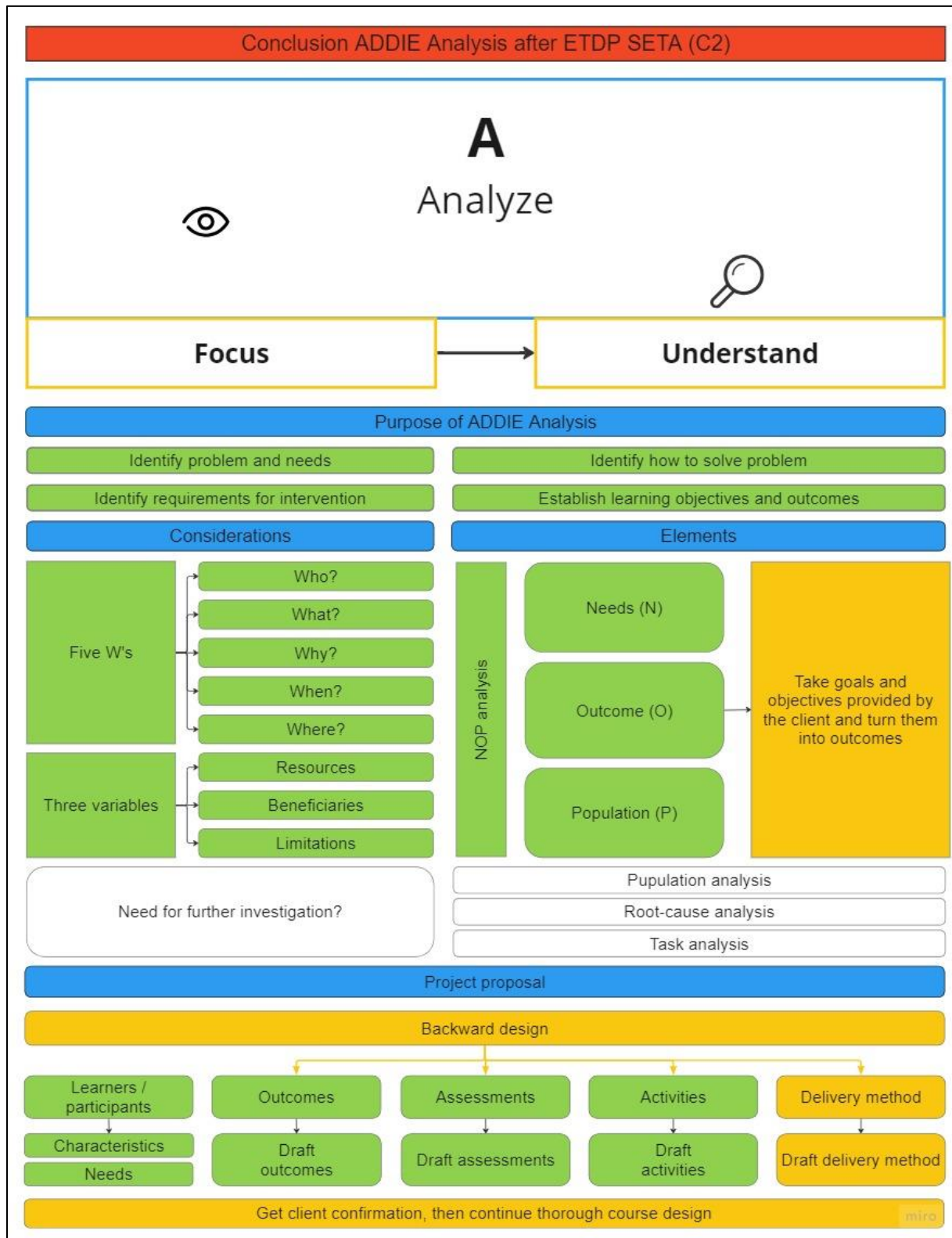
Secondly, additions were made as considerations and elements of a project proposal. Firstly, the use of a shortened backward design; secondly, deciding on a delivery method. (1) The designers applied a shortened version of backward design to develop a project proposal. “We kind of go through a quick backward design. You know what can we make them do within this course in terms of assessment? And then how are we going to teach this? What would we need to put in place? In terms of teaching for this course to fall into place just to get the big outlines out there. To make decisions like we would need 8 weeks, we would need to have facilitators. We need to have, you know, six teams to cover these to cover the expectation we would have so many assignments. And the project you know to make those kinds of decisions.” (P2). (2) The designers specified that the client “wanted it to be online” (P1), illustrating the importance of knowing what the client wants as a delivery method before commencing with design.

C) Analysis conclusion

Confirmed current themes from Cycle 1, as well as themes which emerged in Cycle 2, are illustrated in Figure 4.13. Figure 4.13 illustrates the emerging (orange) clarification of role of designers to set learning outcomes in the analysis phase; the role of the backward design model in the project proposal; planning the delivery method in the proposal, and importance of client relations when analysing a course. All considerations and elements apart from the need for further investigation were confirmed in Cycle 2.

A discussion on ADDIE Design, including the current themes, emerging themes and conclusion of ADDIE Design follows in 4.6.1.3.

Figure 4.13
Conclusion to ADDIE Analysis (Cycle 1 and Cycle 2)

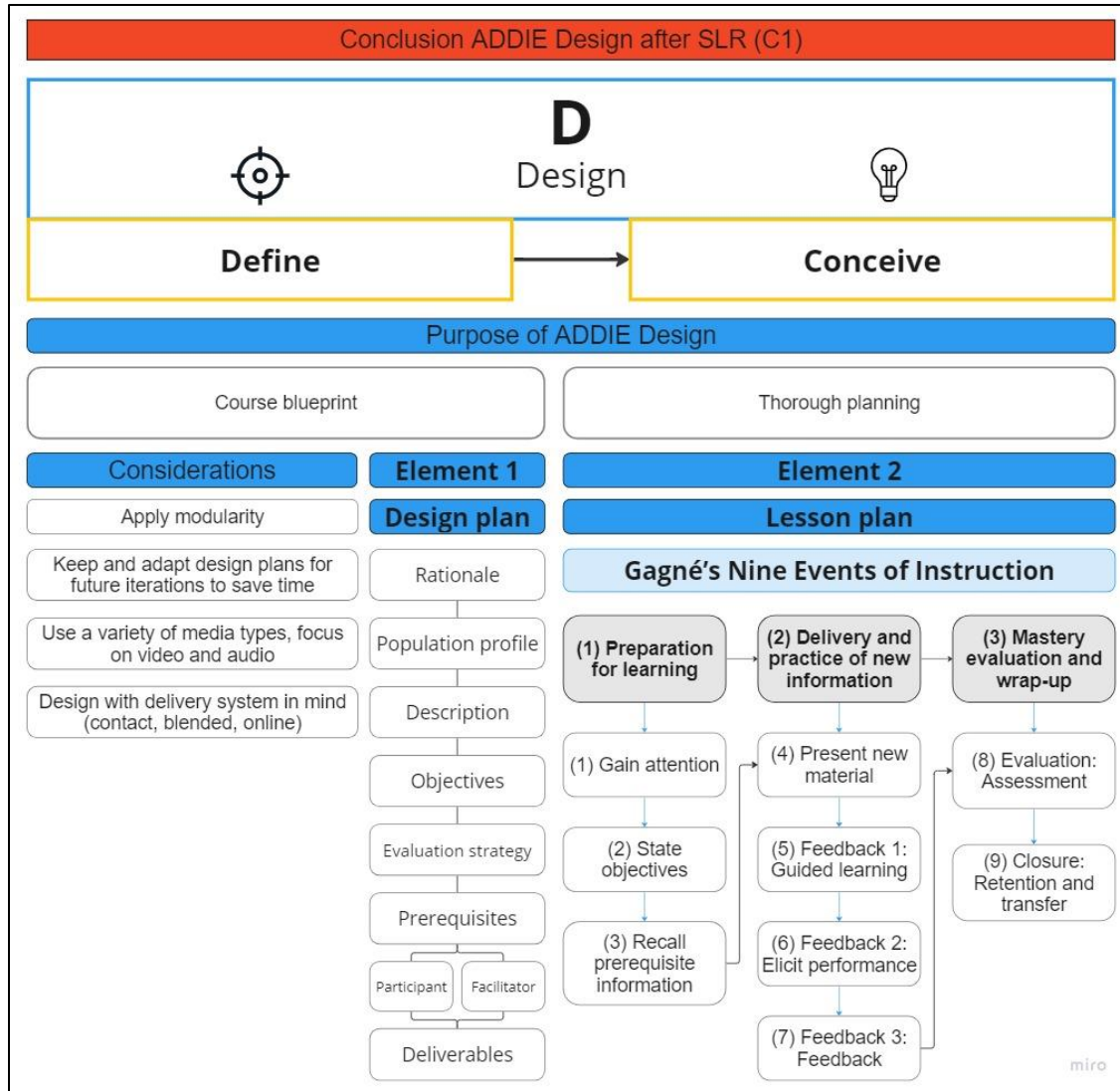


Source: The researcher

4.6.1.3 Phase 2: Design

Figure 4.14 illustrates the findings of the SLR for the ADDIE Design Phase, as presented in Chapter 3.7.3.2 (C) Conclusion: Elements and Considerations of ADDIE Design.

Figure 4. 14
ADDIE Design (Cycle 1)



Source: The researcher

Figure 4.14 presents the purpose, considerations, and elements of ADDIE Design, as the finding of ADDIE Design, in section 3.7.3.2 (C). The two main elements of the ADDIE Design Phase induced in Cycle 1 are the Design Plan and Lesson Plan, which can serve as a course blueprint for the Development, Implementation and Evaluation Phases. In section 4.6.1.3, the researcher analysis the purpose, elements, and considerations of ADDIE Design, based on data gathered through Cycle 2.

A) Design current themes

The current themes from Cycle 1, which were confirmed through the focus group discussion (Cycle 2), are discussed. The researcher discusses the considerations and elements 1 and 2 of ADDIE Design.

Thorough planning was established as a very important current theme. Participant 1 stated that they try to plan such that 90% of the course can run as planned, though they are open to making changes and adapting the course. The course can change during implementation (P1). “If you're busy with something and it doesn't work, immediately regroup” and consider which changes can be made (P1).

Four current design themes were supported by the findings of the focus group discussion, including (1) apply modularity; (2) reuse and adapt previous designs for future use to save time; (3) use of various media types; and (4) designing with a delivery system in mind.

When discussing (1) modularity, P2 stated that they (the designers) designed smaller units which delegates could address to move towards an interim product which can become a final product. “It was almost like 6 small professional development workshops” about various aspects of the delegates’ careers (P2). When discussing (2) reuse and adaptation of previous designs, participant 2 stated that they draw on their existing course catalogue which match the client’s course description and customise the courses to meet the requirements of the client for the new course. Participants in Cycle 2 mentioned use of (3) various media types, including PowerPoints (also referred to as slides), instructional videos, a WhatsApp group (online social community) and an LMS. Lastly, the designers highlighted that consideration was given to the (4) delivery system when designing the course. “This specific (course) was online so they must do things on their own time. It's different if you see them for a week or three days or five days. To do 500 people online, in eight weeks, you must think differently” (P1).

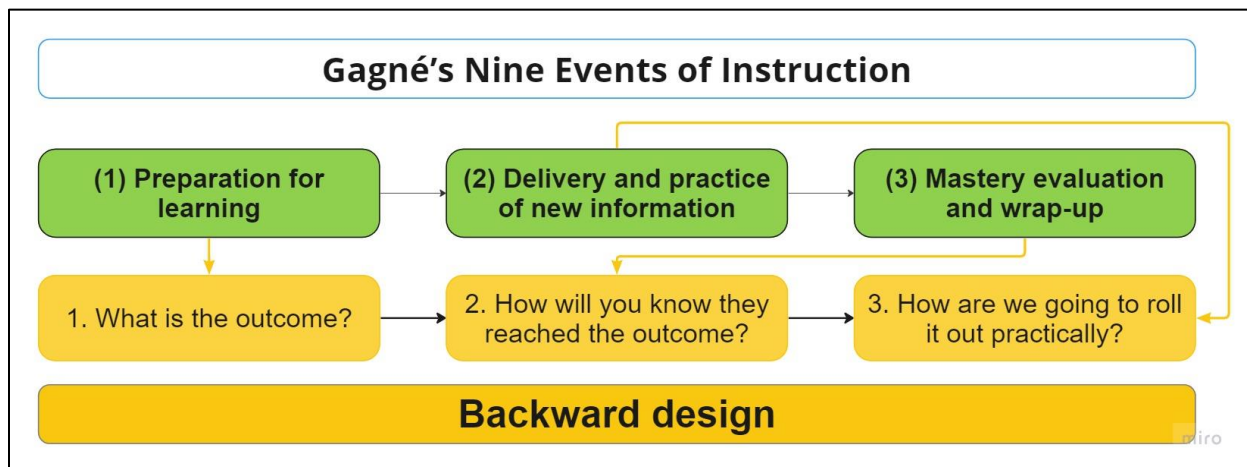
All seven of the sub-elements included in Element 1, the Design Plan were confirmed in Cycle 2. Each of the seven sub-elements are listed with the quote which addresses the element in Table 4.4.

Table 4. 4
Confirmed sub-elements of Design Plan

ADDIE Design Element 1: Design Plan	
Rationale	"We like to build for purpose" (P2).
Population profile	"These people are subject advisors. We find out about that context. Exactly what does that mean? What does it imply, so that we can design something that they can use and develop in their work" (P1).
Description	"They had quite a quite an extensive brief that they gave us on what they would like to be included within that training" (P2).
Objectives	"They provided objectives, and we try to stick to those objectives" (P1)
Evaluation strategy	"Before we start developing content, we would have the backward design in place. Let's say we need 6 topics; for each topic, what is the outcome? What would the assessment be like?" (P2).
Prerequisites	Participants "They stated the need to train 500 curriculum and subject advisors" (P2). "We did expect that these people, or curriculum subject advisors are qualified teachers who have now gotten enough experience as a teacher that they have moved into curriculum and subject advising." (P2)
	Facilitators "They were looking for somebody that can train subject advisors in the use of technology, educational technology" (P1).
Deliverables	Participant 2 stated that they complete backward design, confirming the outcome, assessment, and teaching strategies for each topic. Only then do they "start developing content for each of these topics" (P2).

The focus group discussion confirmed the three phases of a lesson plan as found by the SLR, namely, (1) preparation for learning; (2) delivery and practice of new information; and (3) mastery evaluation and wrap-up emerged as a recurring theme. Figure 4.15 illustrates the three event groups of lesson plan design established in Cycle 1, and the similarity in approach when compared to backward design. A discussion follows.

Figure 4. 15
Gagné's Events of instruction and Backward Design



Source: The researcher

The participants refer to the use of backward design as the backbone of their design approach (P2). Although the order varies, connections were drawn between participants' descriptions of the

three phases of backward design and the three phases of lesson plan design as described by Gagné's Nine Events of Instruction in the SLR. Connections are presented by Figure 4.15. According to P1, they first ask: "What is the outcome? What will the final assessment be to see whether they've reached that outcome?", therefore they start by thinking about mastery, evaluation, and wrap-up. They then go back into the smaller outcomes and for each of those, the designers think, "What must they prepare for before and during a session?" (P1), thereby designing the delivery and practice of new information such that learning will take place. Lastly, the designers think, "How do we assess learning?" (P1). The sub-elements of a lesson plan, along with the phases of the lesson plan, are listed in Table 4.5. A supporting quote is paired with each sub-element to confirm the current themes from Cycle 1 in Cycle 2.

Table 4.5
Confirmed sub-elements of Lesson Plan

ADDIE Design Element 2: Lesson Plan	
Phase 1: Preparation for learning	
Gain attention	"If you can introduce them well in the beginning it really helps" (P1)
State objectives	"We just try to make the brief as clear as possible, and then they discover it along the way" (P1).
Recall prerequisite information	The designers took a very experiential approach to activating prerequisite knowledge. "They bring a lot of experience because they are subject advisors." (P1). "We are really trying to let this person go out and explore what it is that they have known already, instead of us necessarily asking questions" (P1).
Phase 2: Delivery and practice of new information	
Present new material	"If there's a completely new concept that's underlying to what they do, have a discussion about it" (P1). "But you cannot really teach somebody about TPACK. They must work through it and work on it." (P1). According to P1, when presenting in a student-centred approach to adults, an experiential approach is more effective than a one-directional discussion. "It is getting to the assignment as quickly as possible. This is what you must do; how would you do it and have that discussion" (P1).
Feedback 1: Guided learning	"It's really explorative learning and but through the questions that we ask through the rubric in the in the assignment, we sort of guide the learning process to eventually be at a place where they're comfortable with this topic, and then we go to the next topic" (P1)
Feedback 2: Elicit performance	"In most of our courses, as we say, share with your peers, get your peer feedback, you know start that collegial discussion to build yourself up because that also empowers you and your peer to be almost consultative for each other" (P2)
Feedback 3: Feedback	"Then to give that assignment to a facilitator and what the facilitators were tasked to do in this case was to use a rubric that clearly states how we want things to be assessed and to let this person know whether they are working on a novice, a competent or an excellent level" (P2).
Phase 3: Mastery evaluation and wrap-up	
Evaluation: Assessment	"What the facilitators were tasked to do in this case was to use a rubric that clearly states how we want things to be assessed" (P2). "In terms of our formative evaluations in a course like this with six topics, there would be 6 little mini assessments that they would go through, but the culmination of it, which in this case was a project or a portfolio of sorts" (P2)
Closure: Retention and transfer	"Every single task contributed to their portfolio of information or knowledge that they created for themselves along the way. The portfolio therefore was mostly combining everything that they did in the semester, improving on it based on the formative feedback they received for every of those assignments" (P1)

Although some elements and considerations were confirmed during the focus group discussion in Cycle 2, the researcher did discover emerging considerations and elements which should also form part of the Design Phase. These considerations and elements are discussed in the following paragraph.

B) Design emerging themes

Two considerations and four elements emerged while discussing the ADDIE Analysis Phase. The emerging considerations relate to (1) the connection between the project proposal, Lesson plan and Design plan and (2) the use of facilitators for design inputs. The emerging elements relate to the (1) teaching strategy; (2) design model; (3) approach to delivery and practice of new information; and (4) approach to evaluation.

The first consideration is to (1) use the project proposal (resulting from the Analysis Phase) to inform the Design Plan (Design Element 1). “There are two plannings that happen. We have a way of planning very quickly to get something to the client where they can say yes or no. Once the client says yes, then we start, and we build it out” (P1).

Secondly, drawing on the inputs of trainers and facilitators during design is a prominent emerging design consideration. The designers should consider actively involving facilitators in course design (P1). “If we have sufficient time, the facilitators are always involved in the process of designing the course” (P1).

The use of an experiential teaching strategy was the first emerging theme. The designers applied an experiential learning (P1) and project-based learning (P2) approach to facilitate real-world application of new knowledge (P1), which they feel is most fitting for adult learners (P1). A lot of responsibility is placed on participants to take ownership during delivery and practice of new information. “It's explorative learning. We expect all people in our short courses to be an expert in something” (P1). The guidance (from facilitators and designers) is more to help them understand what it is that they take ownership of” (P1).

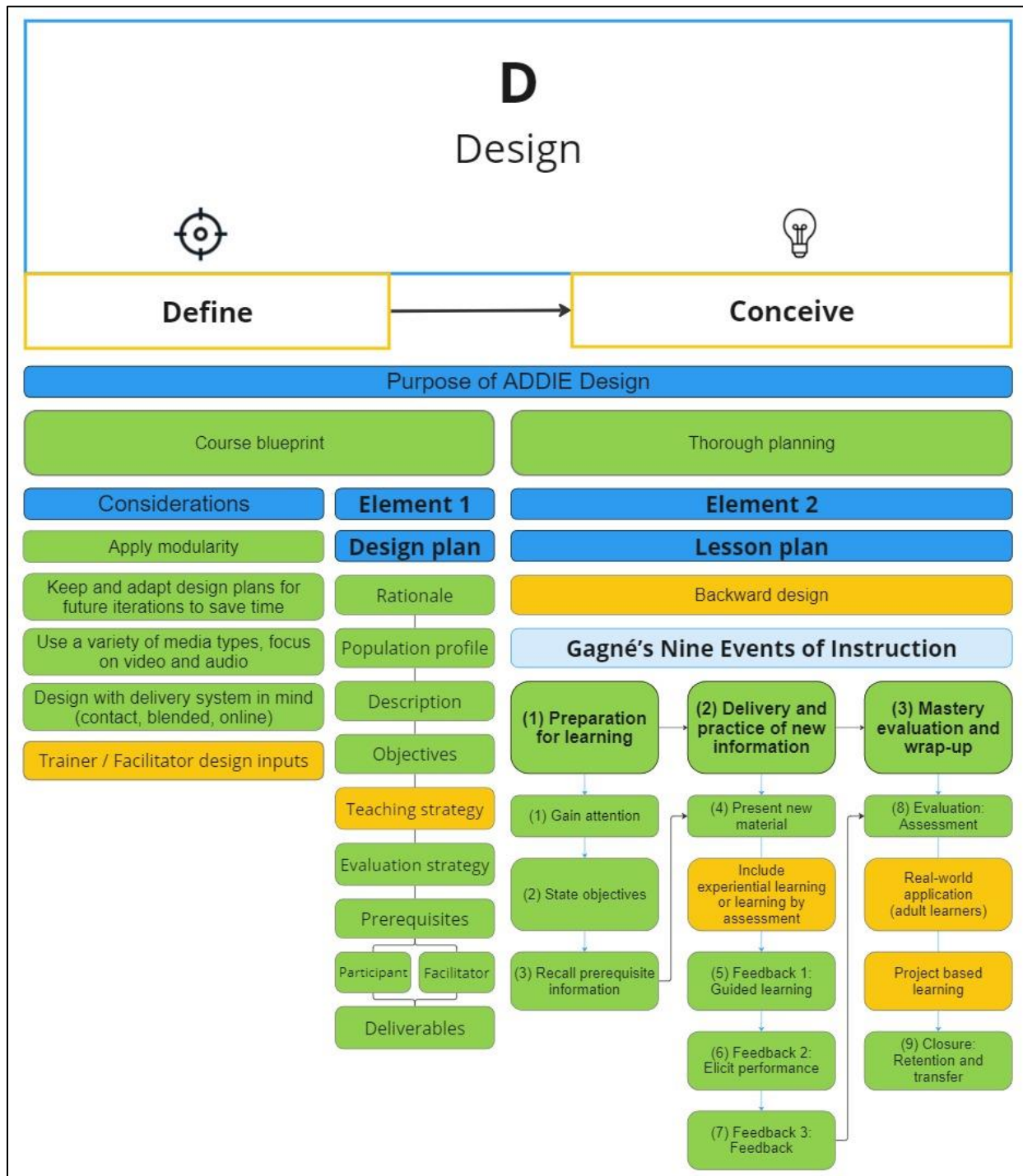
Use of the backward design model, which also emerged as a prominent element in the Analysis Phase, re-emerged as a clear theme for course design. “We follow the backward design process for the actual design of the course” (P1). “The backward design is the backbone of what we do” (P2). “We want to achieve this; how will we know we've achieved it? How will we teach them how to do that?” (P1). “What will the final assessment be to see whether they've reached that outcome and then go back into the smaller outcomes” (P1).

Delivery (3) and evaluation (4) are designed to focus on exploration and real-world application. “We tried to make it real; to make sure that what they are doing fits into their job” (P2). “We are really trying to let this person explore what it is that they have known already, instead of us asking questions to guide them there” (P2). Project-based learning is described as an effective approach for adult learning. “Every single task contributed to their portfolio. The portfolio was mostly combining everything that they did in the semester, improving on it based on the formative feedback they received for every assignment” (P1).

C) Design conclusion

The current themes which were confirmed (green), as well as emerging themes from Cycle 2 (orange) are illustrated by Figure 4.16. Figure 4.16 illustrates that all elements and considerations were confirmed in Cycle 2. The consideration of facilitator input emerged in Cycle 2 (orange), while the use of backward design, planning for a teaching strategy, implementation of an experiential learning approach, real-world application, and project-based learning, emerged in Cycle 2.

Figure 4. 16
Conclusion to ADDIE Design (Cycle 1 and Cycle 2)



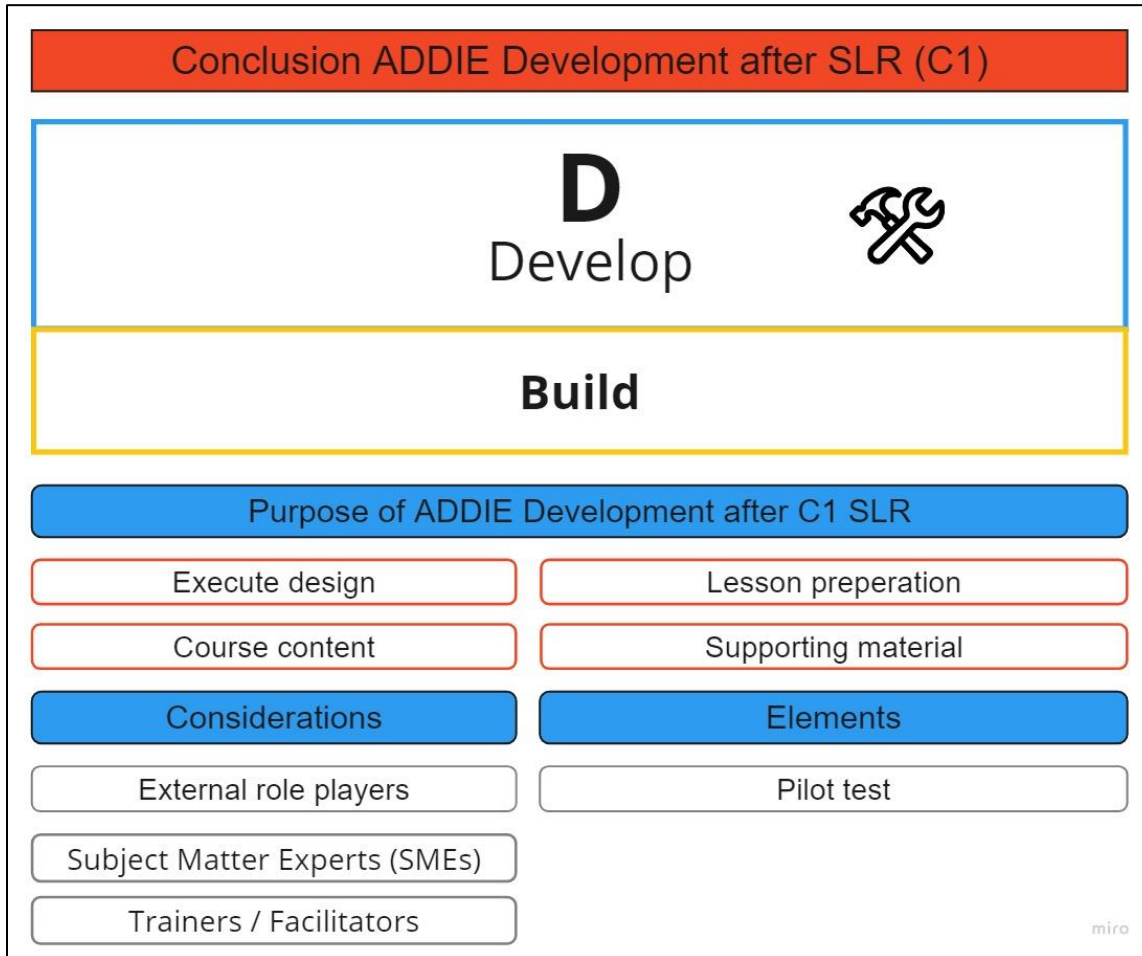
Source: The researcher

A discussion on ADDIE Development, including the current themes, emerging themes and conclusion of ADDIE Design follows in 4.6.1.4.

4.6.1.4 Phase 3: Development

Figure 4.17 illustrates the findings of the SLR for the ADDIE Development Phase, as presented in Chapter 3.7.3.3 (C) Conclusion: Elements and Considerations of ADDIE Development. In 4.6.1.4, the researcher analyses the purpose, elements, and considerations of ADDIE Development, based on data gathered through Cycle 2.

Figure 4.17
ADDIE Development (Cycle 1)



Source: The researcher

Figure 4.17 presents the purpose, considerations, and elements of ADDIE Development, as presented as finding of ADDIE Development, in section 3.7.3.3 (C). The SLR suggested that the main element of ADDIE Development is a pilot test. Designer can consider drawing on the experience and insights of SME's and facilitators during course development. According to Cycle 1, these elements and considerations are essential for design, preparation, and development of course content and supporting material for the ADDIE Implementation and Evaluation Phases.

A) Development current themes

In this section, the researcher discusses the current considerations and elements of ADDIE Development. External role players were confirmed as an important consideration of course development, while a pilot test was confirmed as a critical current element.

Development of course material and supporting material comprises the execution of backward design, done in the Design Phase (P2). Once backward design is completed, the designers start to develop content for each unit (P2). Development of the “actual course material like PowerPoint is usually the last thing we do” (P1).

Involvement of SMEs was confirmed as a consideration in Cycle 2. The designer might need an external advisor to develop content where the designer lacks the required expertise. “We got an external person to advise us. That that person didn't necessarily present that part of the course but made some instructional videos (and other learning materials) which we could include in our course” (P2). Involvement of an SME is therefore a consideration when required, and not elemental to course development.

The implementation of a pilot test was a clear element of the development phase. The feedback gained from the pilot test is “absolutely” used to “improve (the course), or to know where we (the designers) might fall short” (P2).

Though some elements and considerations were confirmed during the focus group discussion in Cycle 2, the researcher did discover emerging considerations and elements which should also form part of the Development Phase. These considerations and elements are discussed next.

B) Development emerging themes

Three considerations for development emerged. The first emerging consideration points to the role of (1) external role players in course development; (2) the repurposing of course and supporting material to save time; and (3) the role of an LMS as the delivery system.

External role players emerged as a broader and more prominent theme than that originally understood in Cycle 1. External SMEs, the designers themselves, and facilitators, can be seen as external SMEs in course development. Firstly, external SMEs can at times be required to create content where the primary course designers lack the required expertise. “We got an external person to advise us on emotional intelligence” (P1). P1, however, also refers to themselves, as the designers, as external SMEs who were approached by the client to design and present a course. Lastly, facilitators are also viewed as SMEs, who play an elemental role to

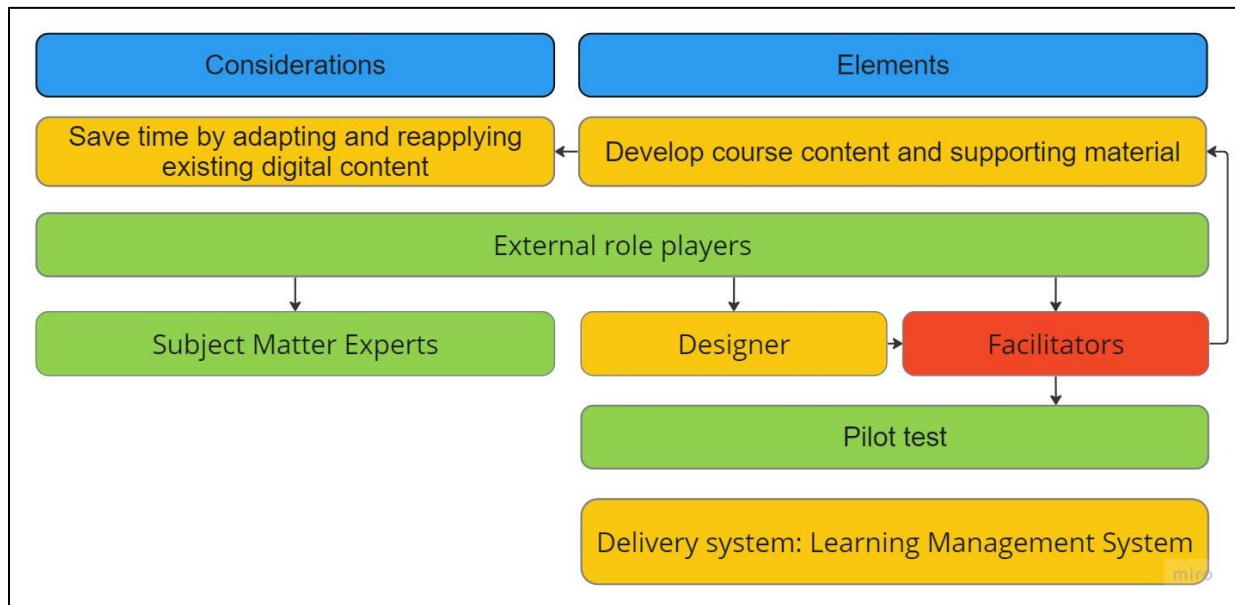
course development. P2 also refers to the development of expert content by the facilitators themselves in the course. “We actually had the facilitators in this case develop some of the expert content” (P2).

External role players can be seen as a consideration because it is not always a necessary inclusion in design, while at other times, it is seen as elemental to course development. External SMEs are involved in course development and implementation because they bring authority and expertise from the outside (P2), which makes participants more comfortable to embrace what they say (P2).

Facilitators were moved from considerations (in Cycle 1) to elements (in Cycle 2) during the development process because of their important role in content development and the pilot test. “The facilitators actually have a more important role than what they sometimes understand” (P1). “If we have sufficient time, the facilitators are always involved in the process of designing the course” (P1). Designers and facilitators collaboratively take responsibility for content development. “The facilitators in this case developed some of the expert content” (P2). The facilitators are used give feedback during the development process as participants in the pilot test (P2). “We would get our facilitators to almost test run the course. Facilitators work through the activities to see where they get stuck because then we know that is where a student could get stuck as well” (P2).

Figure 4.18 illustrates three types of external role players and their functions in course development, based on the findings of Cycle 2. The consideration of involving SME’s is confirmed in Cycle 2. Course designers emerge as element of course development (orange). ‘Facilitators’ is marked in red to highlight that it was a confirmed theme in Cycle 2 but was moved from consideration to element based on the emerging date in Cycle 2. The reader is reminded to revisit an overview of the colour codes in data analysis, Chapter 2.10. The researcher will continue to refer to colour codes in the text.

Figure 4.18
External role players in ADDIE Development



Source: The researcher

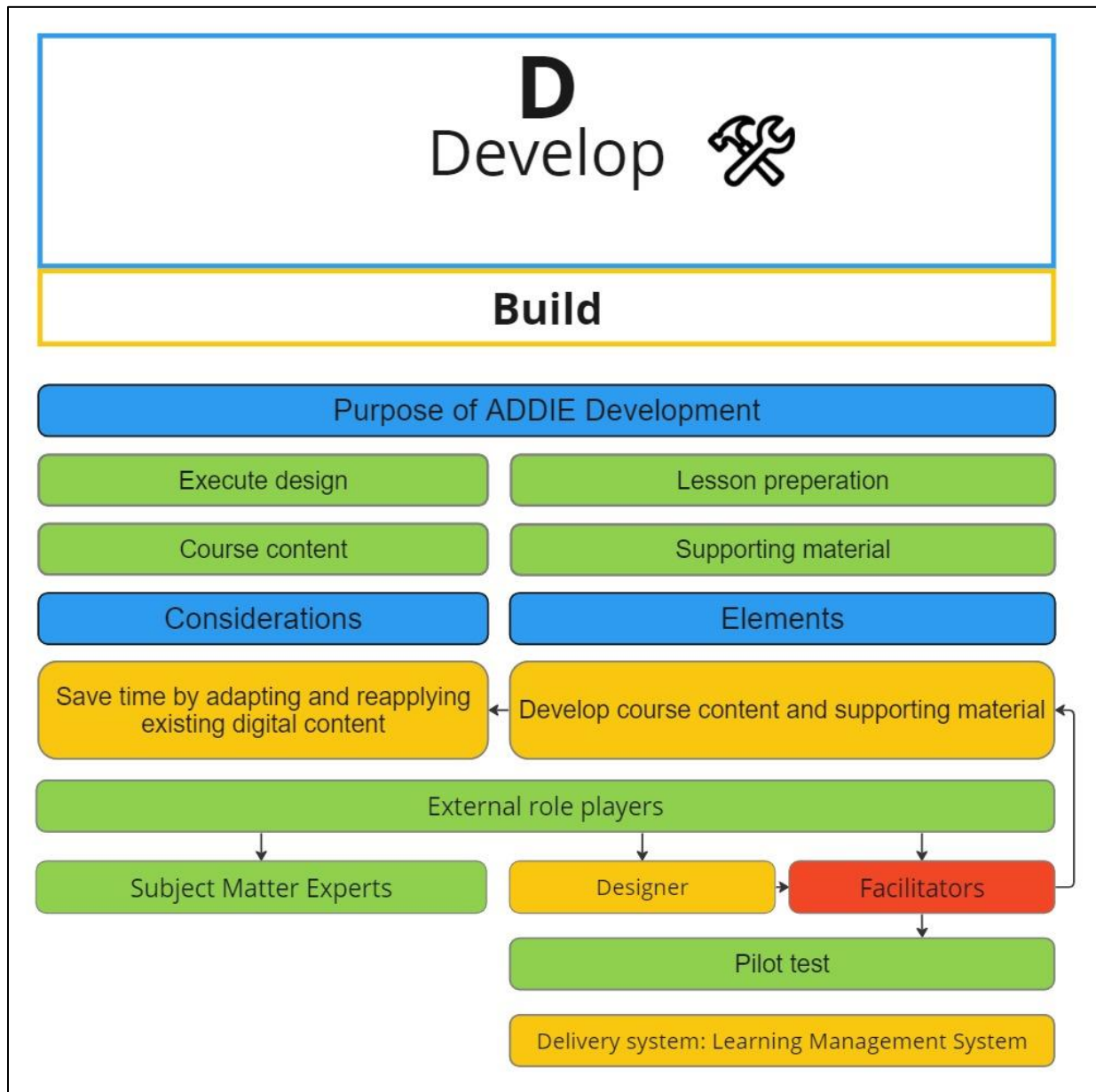
Repurposing course content from an existing course catalogue is a good way of saving time (P1) and was identified as an emerging theme of ADDIE Development. “We made use of some of the content from different courses like a slide, copied and pasted here and there, but the whole design of the Learning Management System, that we did from scratch, since it was so different from what we’ve done in any of the other courses.” (P2).

The use of an LMS as a delivery system for course content emerged as an element of the development phase. The functionalities of an LMS are discussed in detail under the blended learning section later in the chapter. P1 stated that the LMS plays “a huge role that we sometimes underestimate”. “It helps also if you can structure your course through the Learning Management System” (P1). “After designing everything, planning everything, and having everything ready, it needs to be, put onto the Learning Management System to make sure that the LMS also conveys the messages we want to convey” (P1).

C) Development conclusion

The current themes which were confirmed, as well as emerging themes, are illustrated in Figure 4.19.

Figure 4. 19
Conclusion to ADDIE Development (Cycle 1 and Cycle 2)



Source: The researcher

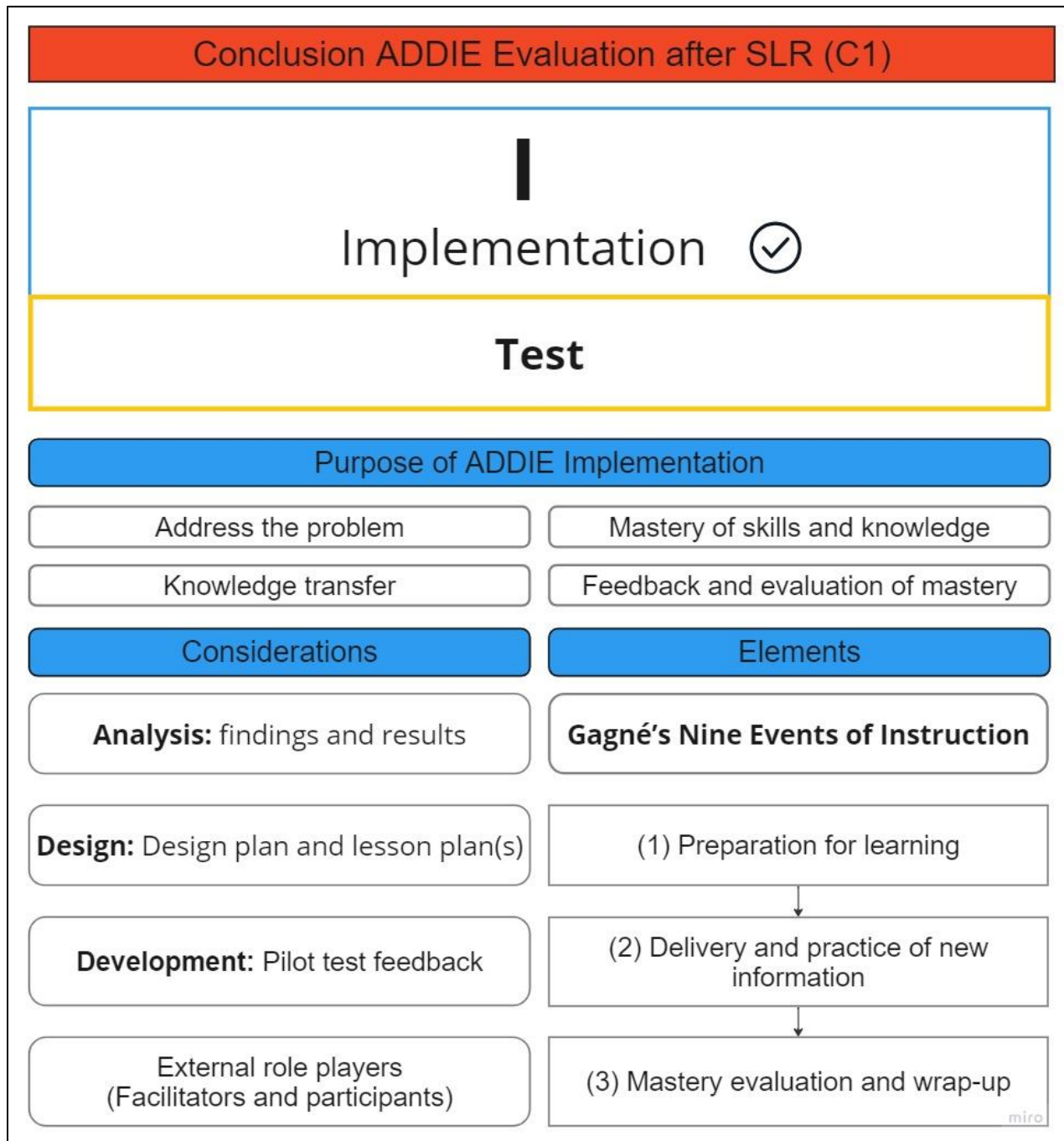
The purpose of ADDIE Development, as well as the roles of external role players, SME's and a pilot test are confirmed in Cycle 2. The role of facilitators in development is emphasised in Cycle 2, while the roles of the designers and facilitators include course development, methods to save time, and development of the delivery system emerges as elements of ADDIE Development in Cycle 2.

A discussion on ADDIE Implementation, including the current themes, emerging themes and conclusion of ADDIE Implementation follows.

4.6.1.5 Phase 4: Implementation

Figure 4.20 illustrates the findings of the SLR for the ADDIE Implementation Phase, as presented in Chapter 3.7.3.4 (C) Conclusion: Elements and Considerations of ADDIE Implementation. The SLR indicates that the main element of the ADDIE Development Phase is implementation of a pilot test, while the designer should consider drawing on the experience and insights of SME's and facilitators during course development. According to the SLR, these elements and considerations are essential for execution of design, lesson preparation, and development of course content and supporting material for the ADDIE Implementation and Evaluation Phases.

Figure 4. 20
ADDIE Implementation (Cycle 1)



Source: The researcher

Figure 4.20 presents the purpose, considerations, and elements of ADDIE Analysis, as presented as finding of ADDIE Implementation, in section 3.7.3.4 (C). In section 4.6.1.5, the researcher analyses the purpose, elements, and considerations of ADDIE Implementation, based on data gathered through Cycle 2.

A) Implementation current themes

The purpose of ADDIE Implementation, as well as the three implementation considerations, were established as current themes of ADDIE Implementation. (1) Implementation must be based on the findings of the analysis phase and should meet the needs of the participants and satisfy the course outcomes. “We design something that they can use and develop in their work” (P1). “They are curriculum and subject advisors that are through this course expected to become advisors of technology integration. We made little expert groups to support the reality of what they are going to do and to support that as a professional competence.” (P2). (2) Implementation must be planned meticulously. “We really try to plan really carefully so the chances that it will run fine is like 90%” (P1). (3) The pilot test and implementation should inform further implementation decisions. “You're always open for changes, so if you're busy with something and it doesn't work, immediately regroup and think, what can we do to either make this work or to change it?” (P1).

The three main event groups of course implementation, namely (1) Preparations for learning; (2) Delivery and practice of new information; and (3) Mastery, evaluation, and wrap-up, were established as elements of implementation. Although the researchers never referred to Gagné’s Nine Events of Instruction specifically, each of the nine phases were addressed by the designers as part of course implementation. Table 4.6 illustrates the three event groups of course implementation, as well as the Nine Events of Instruction, as confirmed by participants in Cycle 2.

Table 4.6
Confirmation of ADDIE Implementation elements

ADDIE Implementation confirmation of Gagné’s Nine Events of Instruction in C2		
Current theme		Quote from focus group discussion
Preparation for learning	Gain attention	Participant 1 stated that they started the course with an in-person introduction. “We actually drove through to be with the participants, just to introduce the course, to get things going and then we went online from there” (P2).
	State objectives	“They provided objectives, and we try to stick to those objectives” (P1), we however set the learning outcomes (P2). “What the facilitators were tasked to do in this case was to use a rubric that clearly states how we want things to be assessed” (P2).
	Recall prerequisite information	“We also had to build on thinking that they have some experiences and that we need to develop them beyond those experiences” (P2).
Delivery and practice of new information	Present new material	The course made use of synchronous online classes, videorecorded for asynchronous access (P1), used WhatsApp as a core space for sharing and discussion (P1) and the LMS for virtual access to and presentation of content (P1). The nature of the delegates’ position, being adults and subject advisors, informed an experiential approach to course implementation (P1). The designers did not want the participants to expect designers and facilitators to produce all the expertise for the delegates (P2). “If you want people to be innovative, they need to immediately start thinking for themselves” (P1). The designers created an integrated learning experience (P2) where delegates could develop their expertise (P2), bring their own expertise to the course (P1) and learn from each other (P1).

	<p>Feedback 1: Guided learning</p>	<p>Although the approach was very experiential, facilitator guidance was provided to help the delegates take ownership of their learning (P1). Delegates were divided into “expert groups” (P2) to work together. We encouraged peer guidance through collegial discussion (P2). The delegates were expected to become advisors in technology integration, so the guided experiential approach empowered delegates to “be consultative for each other” (P2). Facilitators were, however, available to give guidance in synchronous sessions, as well as on WhatsApp. “During our synchronous classes, we listen to what people say and see how we can help them to develop further” (P1). During synchronous sessions, other delegates could listen or demonstrate their expertise and learning (P1).</p>
	<p>Feedback 2: Elicit performance</p>	<p>Emphasis was placed on eliciting performance and displaying competence as advisors in curriculum advisors. “It was quite important that they have sort of practical experience of subject advising while they’re doing the course.” (P1) During synchronous classes, the facilitators acted like consultants who focus on listening to what participants say, provide feedback and suggestions for change, and provide peers the opportunity to learn from one another through demonstration (P1).</p>
	<p>Feedback 3: Feedback</p>	<p>Feedback was provided through performance levels. Facilitators would evaluate assignments through the LMS and let them know “whether they are working on a novice, a competent or an excellent level” (P2). The designers made use of formative assessment, which could be improved continuously based on the feedback received from the facilitators (P2). Facilitators gave the delegates positive, constructive, and formative feedback in written format when the task is submitted, to suggest improvement (P2). Facilitators are not only continuously used to elicit feedback to the participants, but also to the course designers (P1). “We had facilitators to make sure that everybody’s on track” (P1).</p>
	<p>Mastery evaluation and wrap-up</p>	<p>Implementation took the form of project-based learning, where participants compiled their individual assessments to create a portfolio at the end of the course (P2). “So in terms of our formative evaluations, you know in a course like this with six topics, there would be 6 little mini assessments that they would go through, but the culmination of it, which in this case was a portfolio” (P2). “Every single task contributed almost to their portfolio of information or knowledge that they created for themselves along the way. The portfolio therefore was mostly combining everything that they did in the semester, improving on it based on the formative feedback they received for every of those assignments” (P1).</p>

Although some elements and considerations were confirmed during the focus group discussion in Cycle 2, the researcher did discover emerging considerations and elements that should also form part of the Implementation Phase. These considerations and elements are discussed next.

B) Implementation emerging themes

Although the three phases of implementation were confirmed, new elements of implementation emerged under each phase of implementation.

Firstly, access to course material through preparation of hardware should form part of the implementation phase. The designers provided the delegates with hardware, such as tablets, sim cards and internet access, which had to be prepared prior to commencement of the first topic (P2). Setting up the LMS and providing relevant training on the use of an LMS should be considered before presentation of new learning material. “Part of the implementation is to get everybody on [the LMS]” (P1) and to train them on the use of the LMS if it is new to them (P1).

Implementation through an experiential teaching approach was identified as an emerging element. The designers and facilitators opted for an experiential approach to instruction, meaning that new information was not presented, followed by gradual handover of responsibility to the participants, as was described in the SLR. “There are approaches where we consciously decide we will be close to the students at the beginning and then remove ourselves further and further away, but in this case, because these are already specialists in an area. We wanted them to take ownership of this (the course and their learning) from the beginning” (P1). Delegates were expected to take ownership of their learning from the beginning (P1).

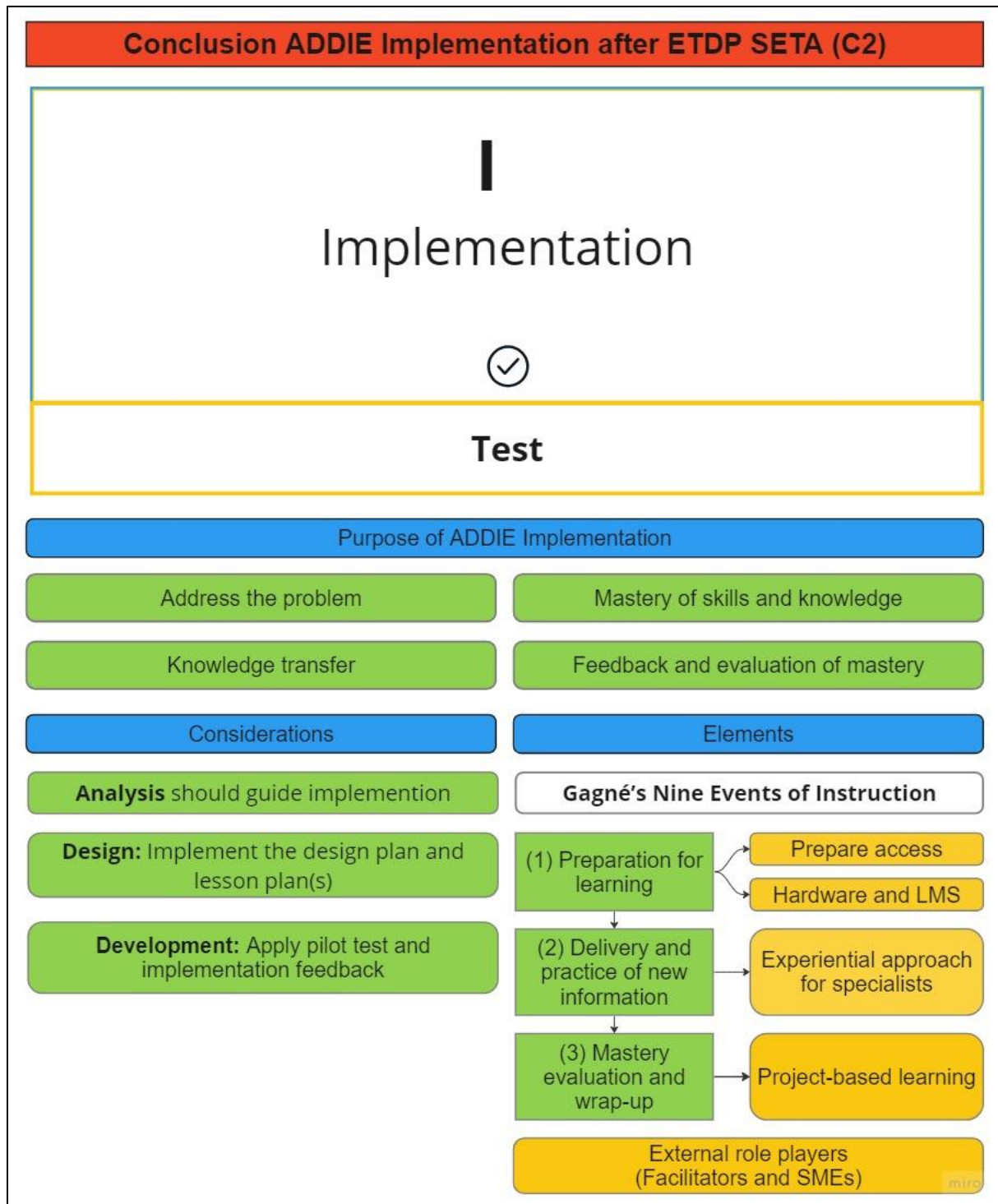
The implementation of project-based learning emerged as an effective method of mastery and evaluation. “They can develop a project which serves as a little guide for themselves and for the people around them” (P1). It doesn't have to be a test or summative assessment; it can be any display of learning (P1). “You put together components in a portfolio, which you can use going forward” (P1).

C) Implementation conclusion

Course implementation can follow the ADDIE Model of ID, but ID is not a linear process. Implementation can inform design and guide redesign during implementation or evaluation.

The current themes which were confirmed, as well as emerging themes, are illustrated in Figure 4.21. The purpose of ADDIE Implementation, as well as the three considerations and three learning events, were confirmed in Cycle 2. Additional tasks such as preparation of access, hardware and the LMS, an experiential learning approach for adult specialists, and project-based learning, emerged as part of the learning events. The elemental role of external role players, including SMEs and facilitators, emerged in Cycle 2.

Figure 4. 21
Conclusion to ADDIE Implementation (Cycle 1 and Cycle 2)



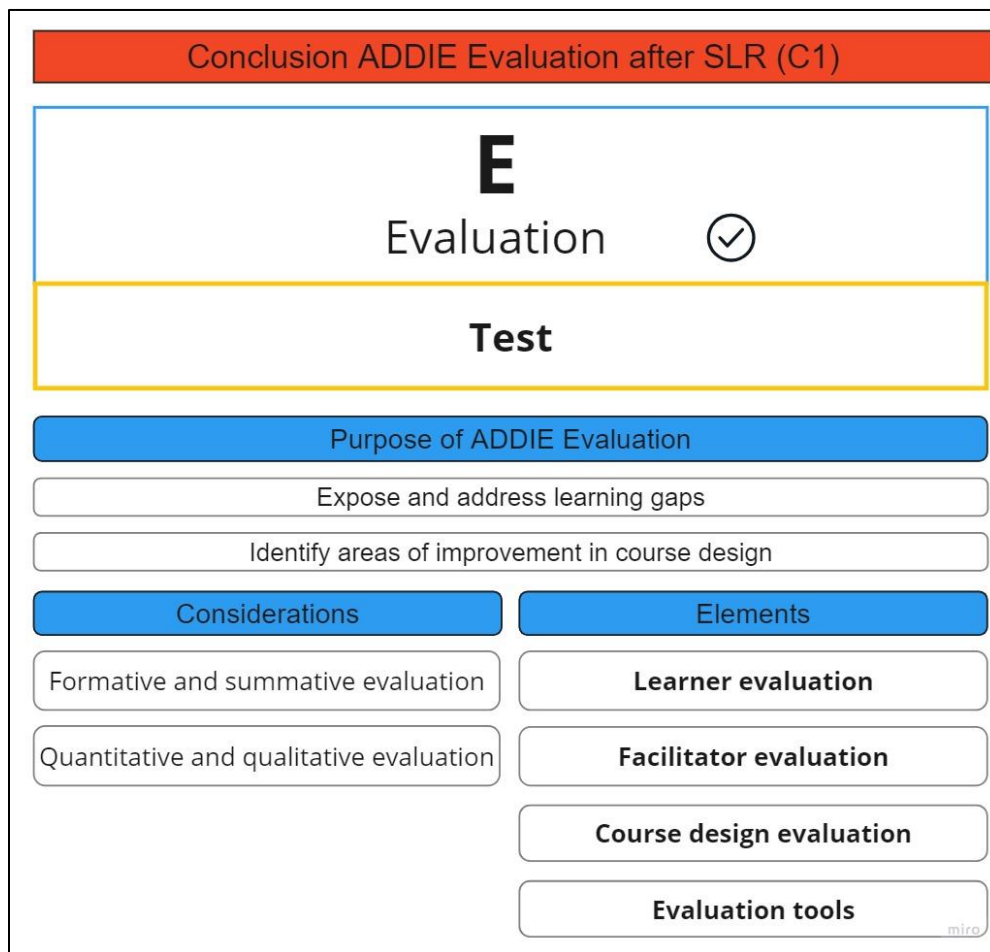
Source: The researcher

A discussion on ADDIE Evaluation, including the current themes, emerging themes and conclusion of ADDIE Evaluation follows.

4.6.1.6 Phase 5: Evaluation

Figure 4.22 illustrates the findings of the SLR for the ADDIE Evaluation Phase, as presented in Chapter 3.7.3.5 (C) Conclusion: Elements and Considerations of ADDIE Evaluation. The SLR indicates that the main element of the ADDIE Development Phase is implementation of a pilot test, while the designer should consider drawing on the experience and insights of SMEs and facilitators during course development. According to the SLR, these elements and considerations are essential for execution of design, lesson preparation, and development of course content and supporting material for the ADDIE Implementation and Evaluation Phases.

Figure 4. 22
ADDIE Evaluation (Cycle 1)



Source: The researcher

Figure 4.22 presents the purpose, considerations, and elements of ADDIE Evaluation, as presented as findings of ADDIE Evaluation, in section 3.7.3.5 (C). In section 4.6.1.6, the researcher analyses the purpose, elements, and considerations of ADDIE Evaluation, based on data gathered through Cycle 2.

A) Evaluation current themes

Two considerations and three elements were confirmed as current themes through the focus group discussion (Cycle 2).

The (1) use of formative or summative evaluation, and (2) use of quantitative or qualitative evaluation were confirmed as design considerations. The designers in this course preferred the use of formative assessment. “This was continuous evaluation. Every single task contributed to their portfolio of information or knowledge that they created for themselves along the way. The portfolio combined everything that they had done in the course, improving on it based on the formative feedback they received for every of those assignments.” (P1). When asked about summative evaluation, Participant 2 indicated that, although this course did not include summative evaluation, summative evaluation does not have to be a test, but can take place through any display of learning.

A designer can use quantitative or qualitative methods for assessment. The designers in this course opted for qualitative assessment. Qualitative assessment was used to evaluate learner competency levels and provide continuous learner feedback. Learner feedback was given based on levels of competence, including “novice, a competent or an excellent level” (P2). “It’s not like a test or an exam where they have to have a specific mark” (P1).

(1) Learner evaluation; (2) course design evaluation; and (3) evaluation tools were confirmed as current evaluation elements. (1) Learner evaluation plays an important role in ID. “We want to firstly make sure that the person has a place to go and put down what they’ve learned” (P2). “It’s not necessarily an assessment for us, it’s more an assessment for the for the person”. Is there something that this person can take with them going forward? What do they have now that they can use moving into the next topic or going forward in life, from this?” (P2). Assessments make participants feel like participation counts, which increases participant motivation (P1).

Course design evaluation (2) was also confirmed as an element of evaluation. Both facilitators and delegates were involved in continuous course design evaluation (P1). Participants completed a survey which “gives us a lot of feedback on the experience of the participants” (P1). Continuous feedback from the facilitators about course design and course implementation would inform design decision and changes to implementation approaches (P1). “Typically, we will make changes if we find it necessary to do that. We’ll see how we can overcome the challenge as we go on” (P1). “We let the challenges that we experience speak to our planning for the next course” (P1).

Evaluation tools (3) was confirmed as an element of evaluation. The designers made use of the WhatsApp social media tool to provide informal learner feedback and monitor engagement (P1). WhatsApp was used to provide informal support to struggling delegates (P1). Assignments were uploaded for assessment and graded based on competence levels through the LMS (P1).

No specific mention was made of facilitator evaluation. This was most likely because the course was a once-off course, rather than a recurring course where the designers would need feedback on specific facilitators' performance.

B) Evaluation emerging themes

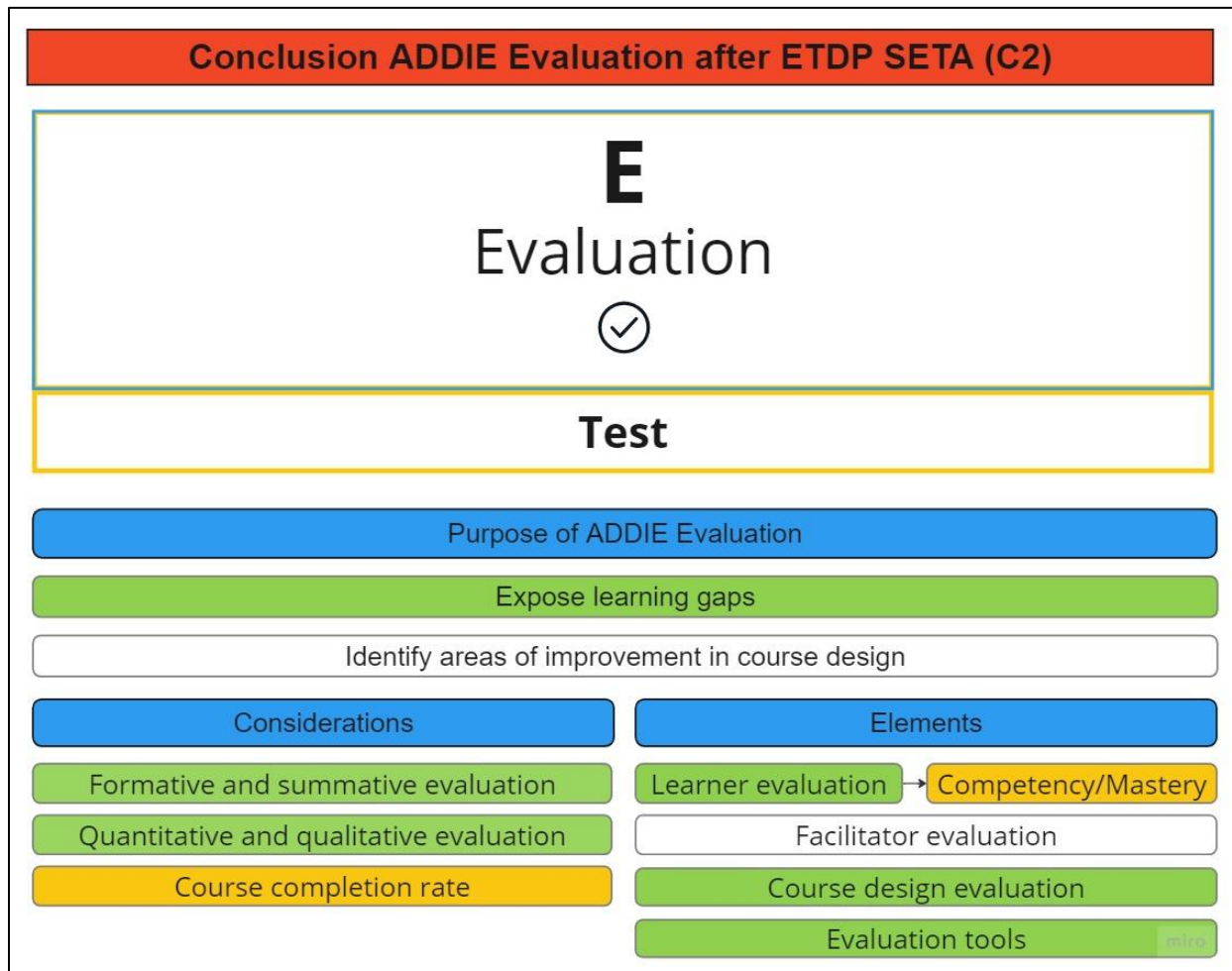
Persistency and course completion was an interesting emerging consideration in the course. According to P1, more than 80% of the participants completed and passed the course, which they deemed as a high percentage for an online course (P1). Though some companies and courses might require a 100% completion rate, designers should anticipate that some participants might drop out of the course, especially for adult learners.

The theme, evaluating based on competency levels, emerged as a sub-element of learner evaluation. The formality of evaluation should be informed by the expectation set by the client. The designer should ascertain “what they want in the end. Do they want a certificate or an accredited course”, or whether it can be more informal and based on basic competence levels (P1).

C) Evaluation conclusion

The current themes which were confirmed, as well as emerging themes, are illustrated in Figure 4.23. The purpose of ADDIE Evaluation; consideration of different evaluation approaches; and evaluation of learners, course design and evaluation tools were confirmed in Cycle 2. Course completion rates emerged as a consideration, with some drop-off to be anticipated by designers. Evaluation for competency and mastery was clarified as part of learner evaluation. The participants did not address evaluation for improvement of course design or facilitator evaluation, but this course was a once-off course, which provides a possible explanation for the omission of this data.

Figure 4. 23
Conclusion to ADDIE Evaluation (Cycle 2)



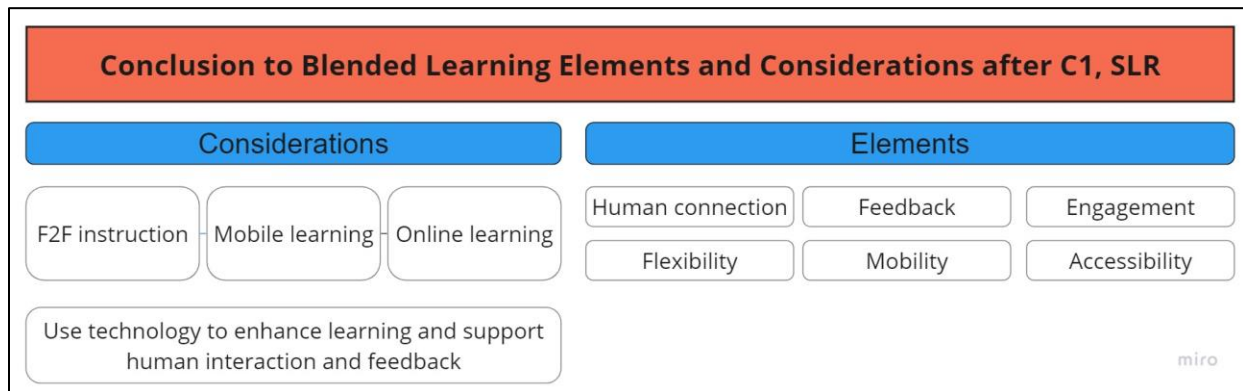
Source: The researcher

A discussion on blended learning, including the current themes, emerging themes and conclusion to Elements and Considerations of Blended Learning follows.

4.6.2 Blended learning

In this section, the researcher discusses the second key research area, namely blended learning. Figure 4.24 illustrates the considerations and elements of a blended learning approach, based on the findings of the SLR.

Figure 4.24
Blended learning (Cycle 1)



Source: The researcher

A discussion of the considerations and elements follows to confirm current considerations and elements, but also to establish emerging considerations and elements. The current and emerging considerations and elements are combined to draw a conclusion on the considerations and elements of blended learning design based on Cycle 1 and Cycle 2.

A) Blended learning current themes

All four considerations were established as current themes in Cycle 2. The four considerations of blended learning included (1) F2F instruction; (2) mobile learning; (3) online learning; and (4) the use of technology to support and promote human connection and feedback.

(1) F2F instruction facilitates connection and meaning (P1). The coursework was presented completely online as per the client's request (P1), but P2 met the delegates in person before course commencement to ensure orientation was well done (P1). "I always find that you can really do a lot with people online later, if you can (meet in person and) introduce them well in the beginning" (P1). Meeting participants F2F allows me to identify students that struggle earlier, provide personal attention, and inspire them (P1). "I find difficult sometimes to do is to inspire people when you can't see them, ever" (P1). Meeting in person fosters a deeper personal connection (P1). Secondly, (2) mobile learning made learning and engagement more accessible to participants (P1). "They have mobile devices, but not all (delegates have) computers" (P1). Thirdly, the course was presented (3) online, by the client's request. Presenting the course online

had its challenges with accessibility to data and electricity (P1) but enabled collaboration and the participation of 500 participants from different districts across the province, which would not have been possible if it were not done online (P1).

Lastly, it was clear that the use of technology, through mobile and online learning was used to (4) facilitate collaboration through human interaction, feedback, and support. An online course should include a platform which enables quick communication, whether it's the LMS itself or an external application (P1). WhatsApp played a significant role in monitoring and providing support and a platform for informal collaboration. "We designed the WhatsApp groups as the core sharing place" (P1). "WhatsApp groups helped us to keep track of people" (P1). "If there's a WhatsApp group, it's easier for people to just quickly say something or ask something on that group" (P1). WhatsApp was used because the LMS the designers used did not have a 'chat' feature to foster accessible communication and collaboration. "It would have been great if the Learning Management System could have had that type of ability, to let people log into a quick app on their phones and be able to talk to each other" (P1).

Six elements of blended learning were also established as current themes, including (1) human connection; (2) feedback; (3) engagement; (4) flexibility; (5) mobility and (6) accessibility.

Human connection (1) plays a pivotal role in design and implementation of a CPD course. It is difficult to inspire people and form a personal connection when you can't see the participants (P1). Meeting in person allows you to inspire participants to realise the value of the course and course content much quicker (P1). Feedback (2) was obtained from peers through collegial discussions over WhatsApp (P1), during synchronous sessions (P1), but also from facilitators (P2). Facilitator feedback was provided in the form of assessment feedback via LMS tools (P2) and informally over WhatsApp (P2). Engagement (3) took place during synchronous sessions (P1) and via WhatsApp discussion (P2). Flexibility (4) was emphasised as an essential element for adult learning, which blended learning enables. "You are going to have to be open to some flexibility with times, and due dates" (P2) because of work or personal obligations (P2). Mobility and accessibility (6) were promoted through provision of tablets and data packages for everyone (P1) and intentional use of mobile devices (P1). WhatsApp groups served as the "core sharing place" (P1) to make it easy to share or ask questions (P1).

Although some elements and considerations were confirmed during the focus group discussion in Cycle 2, the researcher did discover emerging considerations and elements that are very important for blended learning courses. These considerations and elements are discussed next.

B) Blended learning emerging themes

Two considerations and two elements of blended learning design emerged in Cycle 2.

Firstly, design decisions must be driven primarily by the impact that they make. “Sometimes you want people to change behaviour” (P1) and you want participants to think and talk about their learning (P1). Presenting a course through online integration creates time for critical thinking, collaboration, and behavioural change (P1). Secondly, the designer must be considerate of how many participants the course should accommodate when designing a blended course (P1). “In this case it would have been impossible to manage 500 people without a good Learning Management System” (P1).

Two elements were added as emerging themes of blended learning design. Firstly, the role of human connection was expanded to highlight the importance of inspiring participants through human connection. People should feel like they belong in a course (P1). Secondly, the role of the LMS was added to the list of emerging elements of blended learning design. The tools capabilities facilitated by an LMS in a blended course are “beyond nice to have” (P1). A good LMS enables you to do things which “would have been impossible” (P1) if you did not have it, especially for large groups. “It depends on the size of the group. In this case it would have been impossible to manage 500 people without a good Learning Management System” (P1).

The most important functionalities of an LMS, as described by P1, include (1) communication; (2) course structuring and content delivery; (3) assessment; and (4) participant tracking.

An LMS should be able to serve, firstly, as a (1) communication tool for communication from the facilitator or designer to participants and should include a chat function for quick questions and engagements between participants and facilitators (P1).

Secondly, an LMS is described as a useful tool for (2) structuring a course and delivering course content. “It helps also if you can structure your course through the Learning Management System” (P1). An LMS should illustrate how the course will work and progress (P1) and give participants an overview of the course structure (P1). The LMS should be able to deliver content and make content such as documents (P1) accessible; facilitate synchronous classes (P1); and record and upload recordings of synchronous classes for later viewing (P1). P1 stated, in agreement with the findings of Cycle 1, that facilitators should make recordings short and sectioned, to help participants find what they are looking for easily (P1).

Thirdly, an LMS should be able to (3) perform assessment and manage assessments. “We teach by assessment, so the assessment almost drives the learning” (P1). An LMS should be able to manage formative, summative, and project-based assessment (P1). “The more variety in formatting (of assessments), the better” (P1). Assessments motivate participants because it feels like their participation counts (P1).

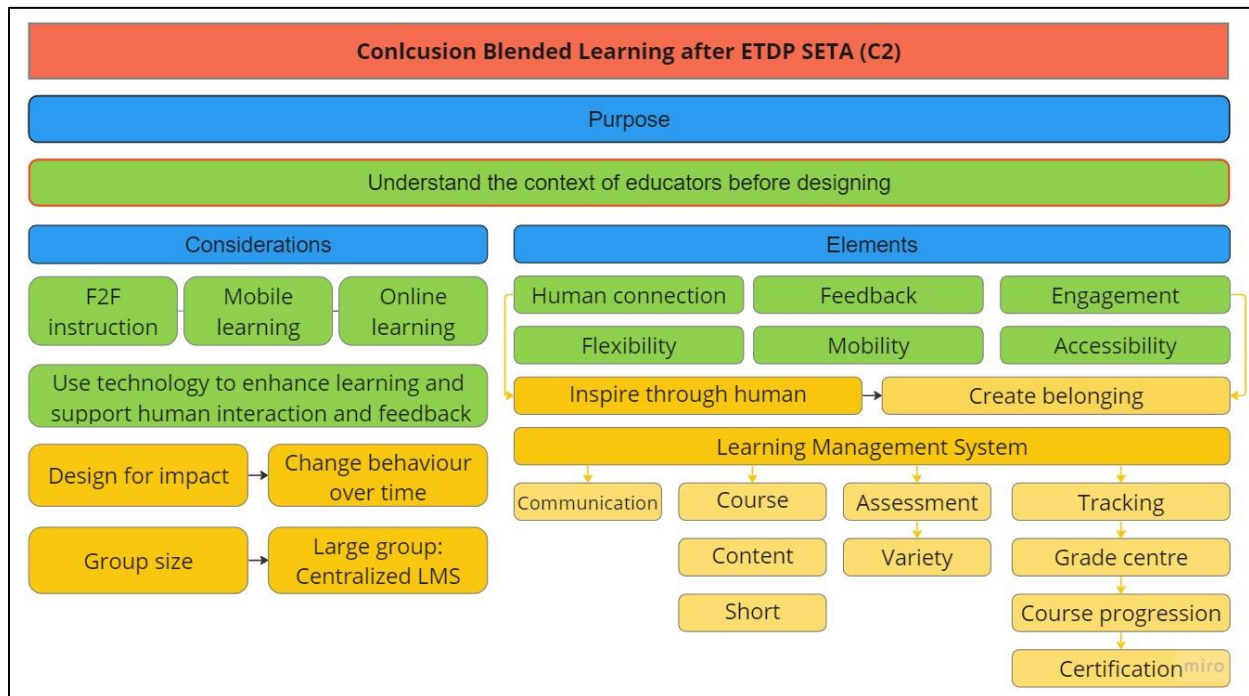
Lastly, an LMS should enable facilitators to (4) track participation and results, through a grade centre (P1). “It is really helpful if you can track results and participation through a grade centre” (P1). The LMS should indicate course structure and progression through the structure (P1). Lastly, an LMS should enable certification as a reward for proof of work that was done (P1).

C) Blended learning conclusion

Despite the challenges brought about by technology integration, the effectiveness of a blended approach as the primary choice of implementation was confirmed in this section. “There's no real other way in which you can bring 500 people from so many districts in the province together get to know each other, talk to each other, almost become friends online” (P1).

The current themes which were confirmed, as well as emerging themes, are illustrated in Figure 4.25. The purpose, as well as the four considerations and six elements of blended learning, were confirmed in Cycle 2. It emerged that designers should consider how course design can impact on behaviour and how group size impacts on decisions about LMS design. The elemental role of human connection, inspiration and belonging, as well as the instrumental role of an LMS, was emphasised in Cycle 2. Designers should make use of LMS tools to enhance the learning experience. The reader is encouraged to revisit Appendix B, LMS tools, for an in-depth discussion on LMS tools.

Figure 4.25
Blended learning (Cycle 1 and Cycle 2)



Source: The researcher

4.7 Conclusion (Cycle 2, ETDP SETA)

In this section, the researcher concludes Chapter 4 by addressing the findings of the first sub-research question:

Second sub-research question:

What are the design elements of an existing blended CPD short course for educators?

This study was conducted in the context of educators participating in short CPD programmes. The researcher focused on two key research areas, namely blended learning and design elements. Based on the findings of the ETDP SETA course (Cycle 2), the researcher finds the following considerations and design elements when designing a blended CPD short course for educators.

Firstly, a designer must understand how adults learn, considering the context of a learning programme for educators. *Secondly*, designers must implement a tried and tested ID model, such as the ADDIE Model of ID. ID model application should be iterative. Evaluation should assess mastery and improve course design. *Thirdly*, blended learning, which includes online and mobile

learning, is emerging as the most prominent and likely method of teaching and learning for current and future learning programmes. Blended learning programmes should promote human interaction, provide regular feedback, use active learning, and be flexible, mobile, and accessible.

The SLR ascertained that there is a need for access to CPD opportunities. CPD needs to acknowledge that participating in CPD programmes mostly takes place concurrently with other work obligations. Designers must therefore apply the six principles of andragogy (adult learning) and leverage the power of blended, online, and mobile learning to meet the needs of the participants.

4.8 Test

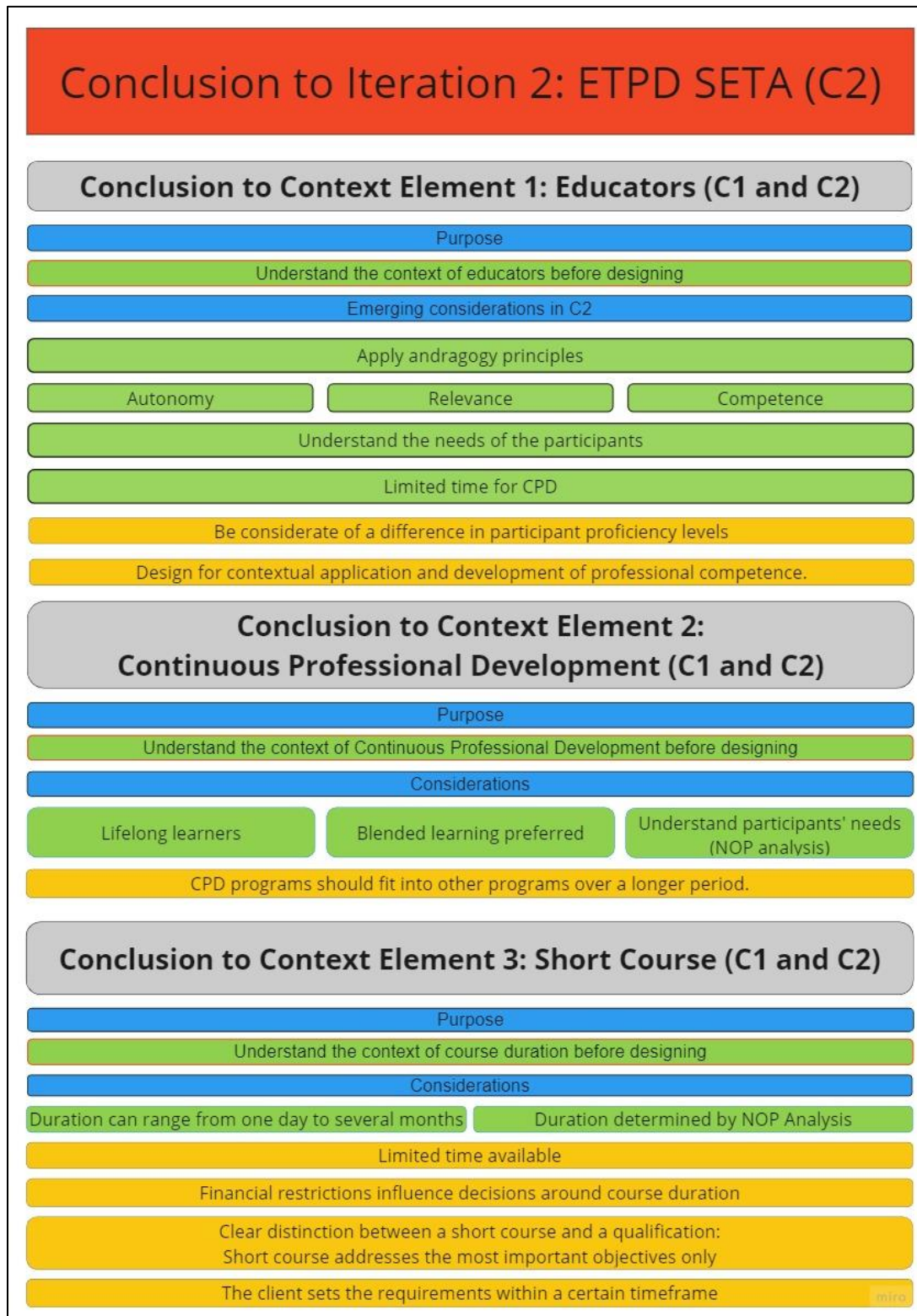
Based on the analysis and findings of Chapter 4, Figures 4.26–Figure 4.28 present the revised and updated set of elements and considerations of blended CPD short course design for educators.

Figure 4.26 illustrates the confirmed (green) and emerging (orange) purpose and considerations of the three context elements addressed by the study, after Cycle 1 and Cycle 2. The researcher is pleased that the majority of the themes that emerged in Cycle 1 were confirmed in Cycle 2. The rich data collected and analysed in Cycle 2 does, however, add critical insight from experienced course designers, especially when addressing the context of short courses. The researcher acknowledges the intricacies of designing learning programmes for the research context and these were considered when implementing these elements for testing and feedback in practice in Cycle 3.

Figure 4.27 presents the revised ADDIE Model after analysis of data in Cycle 2. Critical additions were made to the role of theoretical design approaches such as the backward design model, as well as the utilisation of experiential learning and project-based learning approaches for adult learners. Critical views were expressed on the elemental role of facilitators and course designers in the ADDIE Development phase. The participants also enriched the researchers' understanding of preparation for implementation and implementation strategies, such as experiential learning and project-based learning.

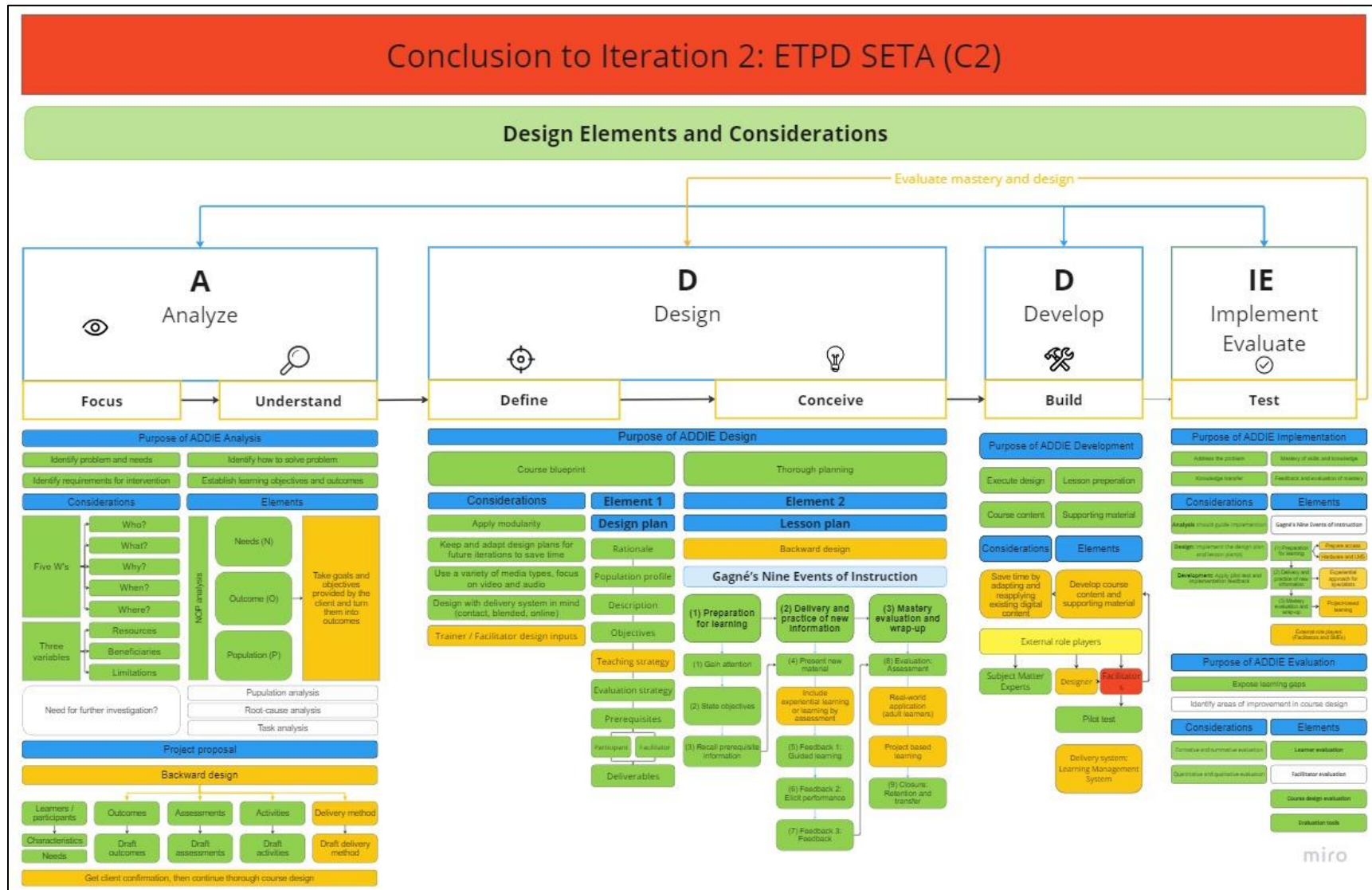
Lastly, Figure 4.28 presents the adapted considerations and elements of the blended learning approach. Significant contributions were made to the researchers' understanding of the use of blended learning models to enrich the impact of the learning environment, and how human connection, paired with effective use of an LMS and LMS tools, can empower course participants.

Figure 4. 26
Conclusion to Context 1 - 3 (Cycle 1 and Cycle 2)



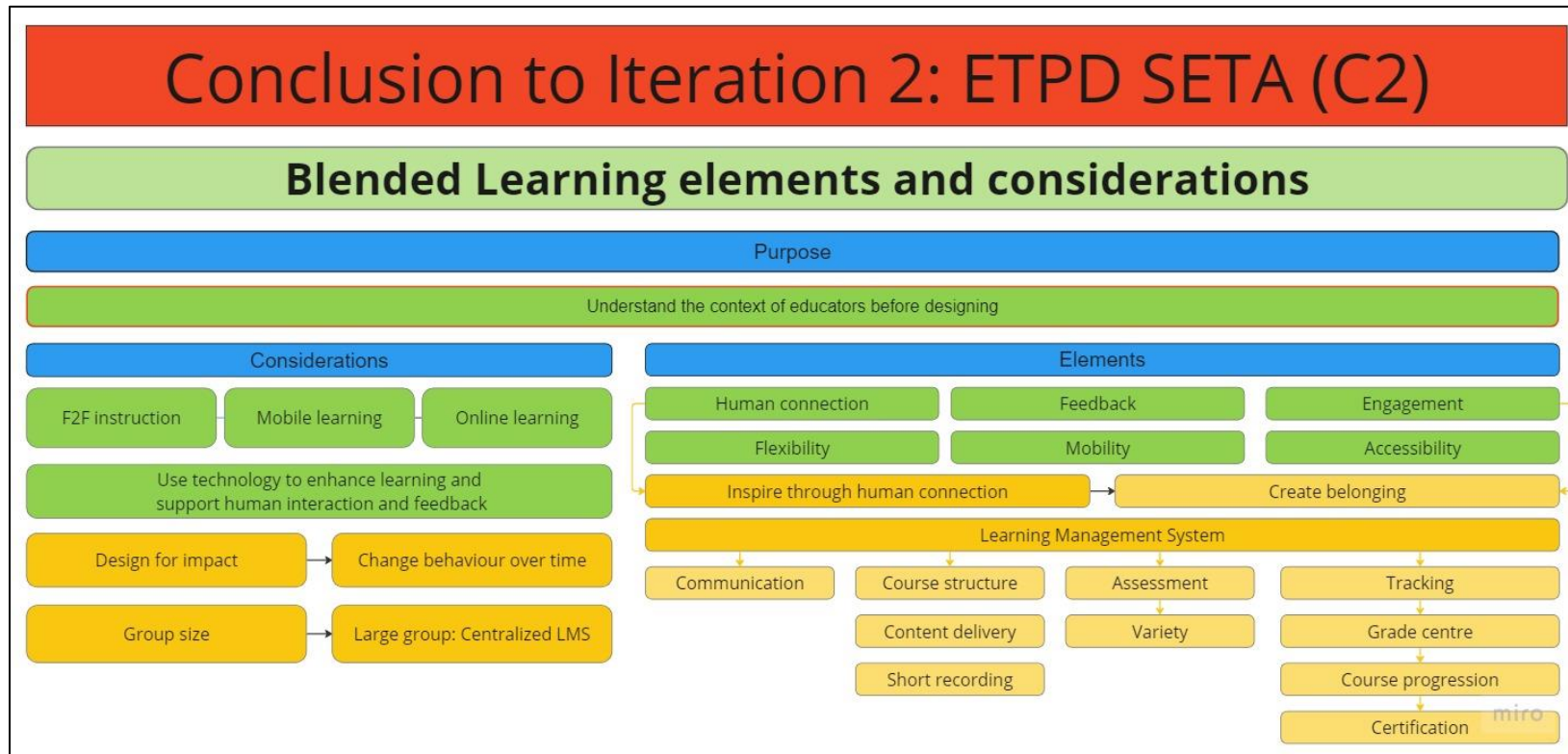
Source: The researcher

Figure 4.27
Conclusion to Design Elements (Cycle 1 and Cycle 2)



Source: The researcher

Figure 4.28
Conclusion to Blended Learning (Cycle 1 and Cycle 2)



Source: The researcher

The researcher will now discuss how the adapted and revised elements and considerations were applied by designing and implementing a blended CPD short course for educators in a public school through Cycle 3.

Chapter 5: (Test Cycle 3) Elements from a newly designed course

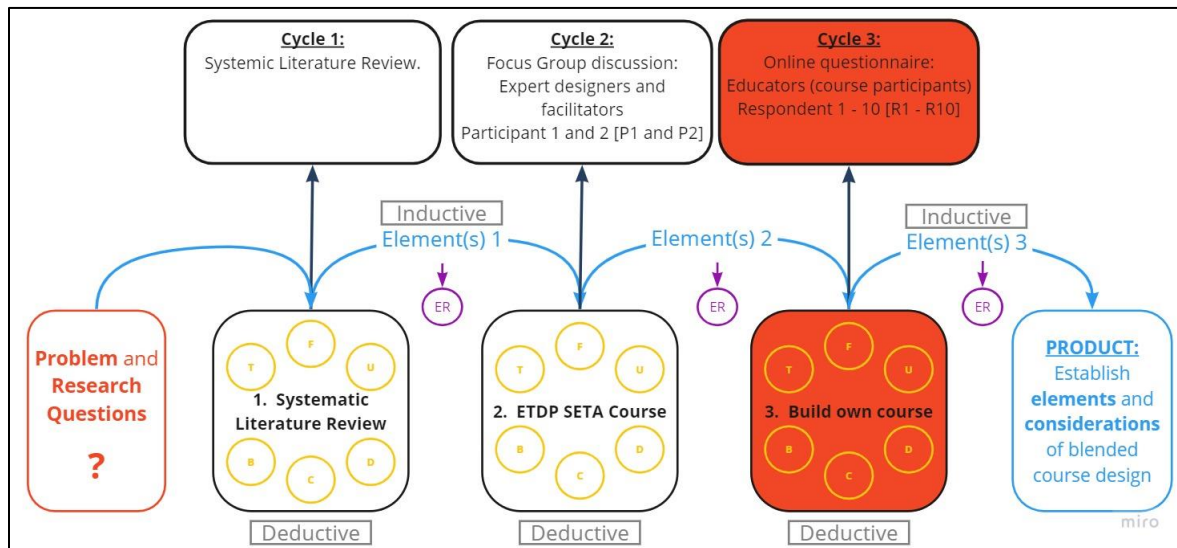
In this chapter, the researcher induces a broadened and updated set of elements and considerations of blended CPD short course design for educators. The findings of Chapter 5 are induced from the perspective of educators who participated in a newly designed blended learning programme, presented in 2023. Chapter 5 addresses the third sub-research question.

Third sub-research question:
What are the design elements of a newly developed blended CPD short course for educators, based on educators' experience of course design?

5.1 Introduction

In Cycle 3, the researcher designs and implements a newly designed blended CPD short course for educators. The researcher draws on the elements and considerations of blended CPD short course design for educators, which were established in Cycle 1 and Cycle 2 of the study, to design the course. Figure 5.1 illustrates the positioning of Chapter 5, Cycle 3, in the study.

Figure 5. 1
Cycle 3: Newly designed course



Source: The researcher

Figure 5.1 illustrates that, in Cycle 3, the researcher designed and implemented a new course to test elements and considerations induced in Cycle 1 and Cycle 2 to induce an updated and enriched set of elements and considerations (E3).

Cycle 3 is the final iteration of the DBR cycle, as presented in Table 5.1.

Table 5. 1
DBR Process applied to Cycle 3

DBR	Focus	Understand	Define	Conceive	Build	Test
C3	Specify the audience, problem, and constraints in Cycle 3.	Understand the context of the participants and design in C3 by gathering information about the environment and prospective delegates.	The purpose of C3 is to establish the updated set of design elements (E3) by gathering information from 10 educators as course participants.	Sketch a plan for the solution by making use of the theoretical underpinning (ADDIE Model of ID).	Design and implement a new course addressing the problems and needs identified during the Focus and Understand phases as well as ADDIE process.	Design elements established and used for writing up of findings and results (Chapter 6). Elements can be applied and tested beyond the scope of this study through new course design.

5.2 Focus

In Cycle 2, the data source shifts from the insights of experienced course designers to that of teacher-participants in a South African public school. The course, designed by the researcher, was implemented by an educator at the school. The course implemented a combination of F2F- and online engagements. Cycle 3 served as a practical implementation of elements and considerations, induced in Cycle 1 and Cycle 2, for the purpose of obtaining real-world user feedback for further analysis. Participants were given an opportunity to address and comment on the elements and considerations applied in this course. Participants were also invited to comment on their experiences from other courses they have participated in to provide rich data for analysis.

Written permission for course implementation was granted by the DBE and school principal before course implementation. The researcher and participants faced time constraints, as participants voluntarily participated in the course during their regular duties as educators. A natural teacher environment served as a realistic context for course implementation. Data collection was performed through an online survey, for convenience. The online survey allowed participants to manage their own time and pace to provide rich data. Enumeration (Julius et al., 2018) was used

to analyse the survey data, and findings are presented in Chapter 5. Bias was mitigated by using a facilitator from the school, who was not informed of the elements or considerations used to design the course.

5.3 Understand

In the Understand phase, the context of the participants and facilitator is clarified. The researcher conducted a pre-course analysis meeting with the Deputy Principal two months before course implementation. The meeting was used to gain understanding about the context and needs of the school and course participants. It was identified that the school needed to create a platform for teachers to identify the school's strengths, weaknesses, and key focus areas for development for the development of a 7-year vision for the school. The course was titled 'VISION 2030'. The Deputy Principal completed an online survey to describe the needs, preferred outcomes, timeline and delivery method.

The questions in the pre-course survey can be found in Appendix C, C3. Pre-course survey. An example of a response to the pre-course survey can be viewed in Appendix C, C3, Pre-course analysis survey. The questions in the research review questionnaire can be viewed in Appendix C, C3, Research questionnaire.

Using convenience sampling, 10 course participants were selected. Seven participants completed the course and research questionnaire. Course participants included teachers, grade heads, heads of department, and a Vice Principle from a public primary school in South Africa. The researcher intentionally sampled a variety of roles, ages and experience levels when selecting participants for Cycle 3. The sample offered rich data from a variety of educators' perspectives. The professional profile of the participants in the online survey, as well as the context of the course, the designer and the facilitator are illustrated in Table 5.2.

Table 5.2
Sample size and description for Cycle 3

Cycle 3: Design and implement a short blended CPD programme for educators		
Description	Role	Institution
Researcher	Design and implement course as SME, with the help of a facilitator	Higher education institution
Facilitator	Facilitate the course	Public primary school Deputy Principle
Course participants		
Respondent 1–10	Participate in the course and complete the online questionnaire upon course completion.	Public primary school in South Africa
Course completion	Seven out of ten course participants completed the course and course evaluation survey upon completing the course.	

Source: The researcher

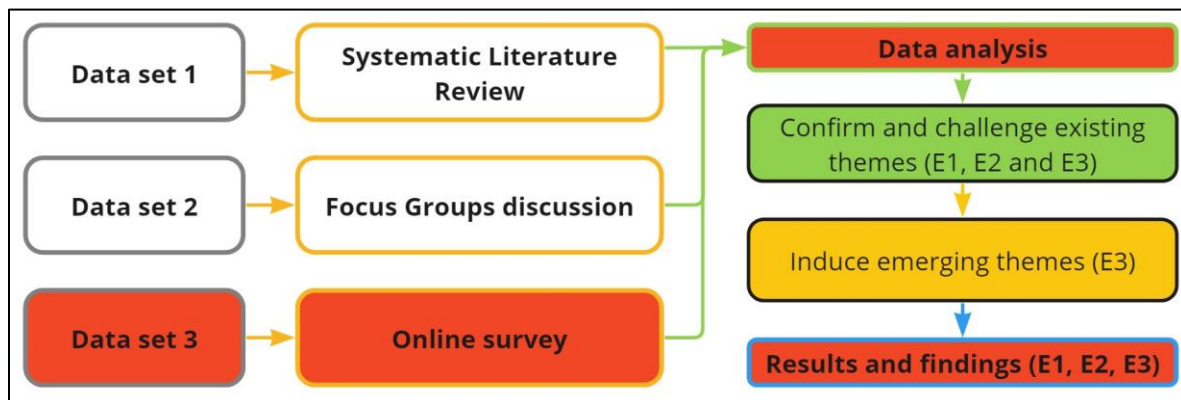
5.4 Define

The purpose of Cycle 3 is to induce the third and final refined set of design elements (E3). The researcher used Cycle 3 survey data to induce a revised and expanded set of elements and considerations for the three research contexts and two key research focus areas addressed by the study. Elements and considerations from Cycle 1 and Cycle 2 are tested in practice, and course participants are invited to provide feedback on the perceived value and importance various course design elements.

The researcher designed a short (one-week) blended CPD programme for 10 educators to address a need at a public primary school. The course was largely presented online through the Google Classroom LMS, which was conveniently available to the participants. The designer implemented a blended learning approach by combining the Google Classroom LMS; a series of facilitator-led F2F reflection activities; social media (WhatsApp); online forms; informal F2F collaboration; and LMS discussion forms for course delivery. The implementation approach was experiential. Participants were allowed to collaborate and discuss topics in-person, online and through social media, but were required to make individual submissions on the Google Classroom LMS.

Upon course completion, participants completed an online survey to provide feedback on their views of the elements and considerations of course design applied in this course. Participants were invited to also share their experiences from other courses they participated in, to enrich the data. The data analysis process is illustrated in Figure 5.2.

Figure 5.2
Research Cycle 3



Source: The researcher

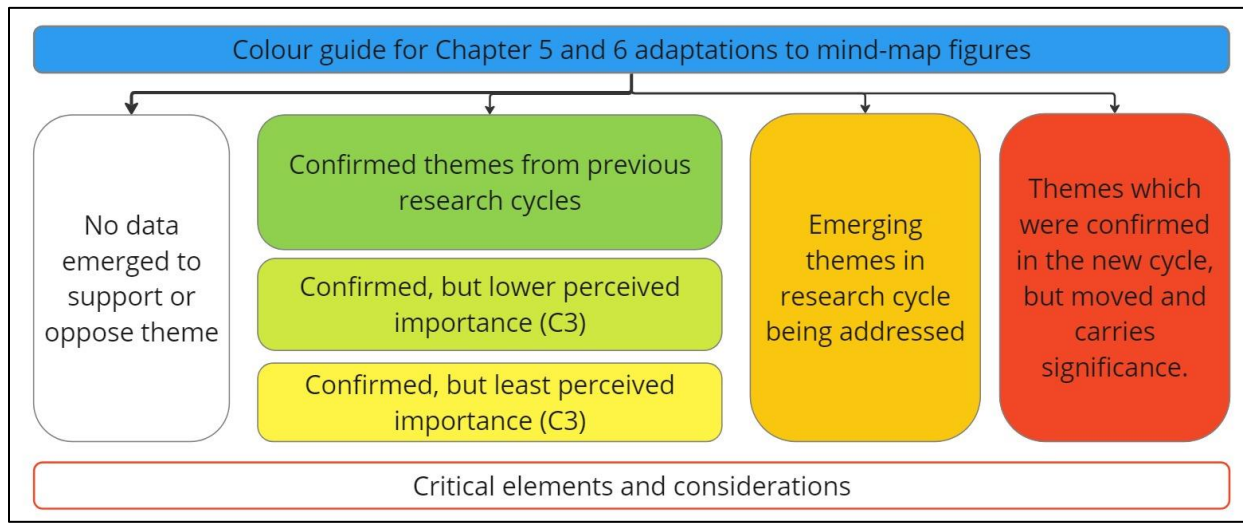
The survey was designed to confirm, enrich, and oppose the elements and considerations (Cycle 1 and Cycle 2), as applied in Cycle 3. The survey addressed elements and considerations of Context Elements 1, 2 and 3; the ADDIE process; and blended learning. The researcher used a combination of multiple choice questions and text responses in the survey to gather data for Cycle 3.

5.5 Conceive

In Cycle 3, research data is used to induce the final, revised set of elements and considerations of course design, by drawing out participant responses to the elements and considerations applied in Cycle 3. The researcher starts each section by presenting the current considerations and elements, as induced in Cycle 1 and Cycle 2. The figure is followed by analysis of the survey responses and concluded with an updated, restructured version of findings and results for each section. Numbering is used in the Chapter 5 figures to assist the reader to connect text analysis and updated figures at the end of each section.

The reader is reminded to revisit the data analysis process described in Chapter 2, section 2.10. In Chapter 5, the researcher continues to use colour codes in mind map figures to illustrate unaddressed (transparent); confirmed (green); emerging (orange); adapted (red) and critical (red border) themes. In this chapter, the researcher adds to the colour coding to enrich the discussion by drawing on research data to highlight the perceived role and importance of the elements and considerations. Dark green indicates confirmed and important, light green indicates confirmed but less important elements and considerations, while yellow blocks indicate the least important, based on the data in Cycle 3. Figure 5.3 illustrates the adapted colour codes for Chapters 5 and 6.

Figure 5.3
Figure colour guide for data analysis in Chapters 5 and 6



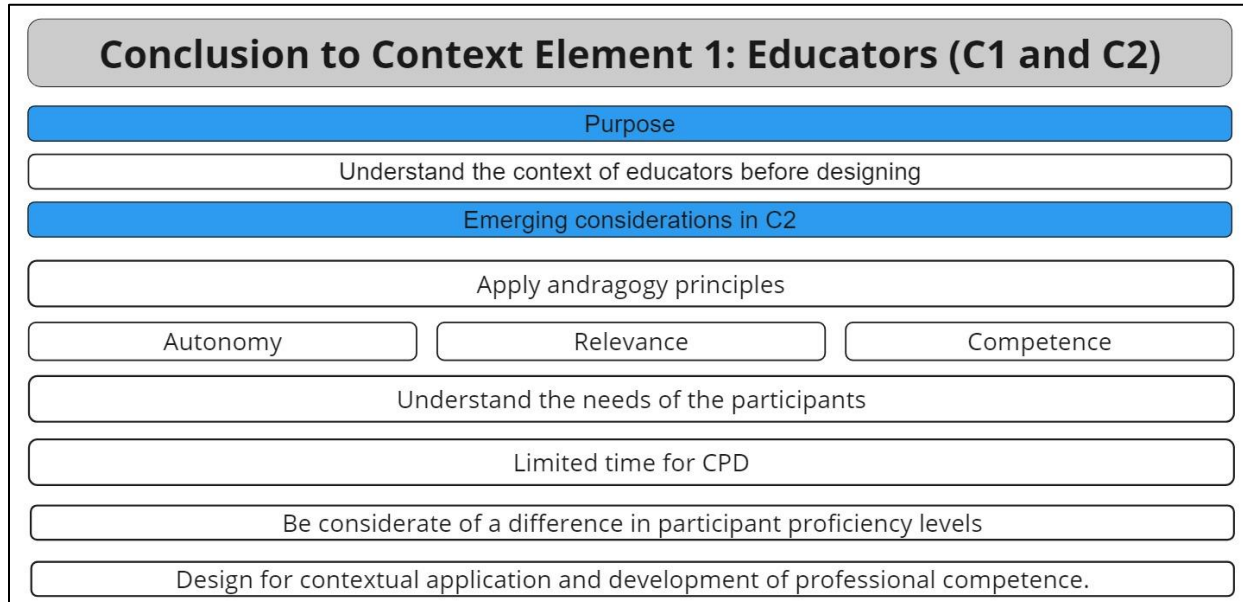
Source: The researcher

In 5.5.1–5.5.3, the researcher addresses the three research contexts, namely (1) educators; (2) CPD; and (3) short course.

5.5.1 Context: Educators

Figure 5.4 illustrates the current considerations and elements of Context Element 1: Educators after Cycle 1 and Cycle 2, as presented in 4.5.1.3. Following Figure 5.4, the researcher presents the analysis and findings of the survey data (Cycle 3) to induce a final revised set of elements and considerations.

Figure 5. 4
 Context Element 1: Educators (Cycle 1 and Cycle 2)



Source: The researcher

The researcher draws on the findings and results from Cycle 3 to clarify and expand the considerations established in Cycle 1 and Cycle 2 for Context Element 1: Educators. The researcher analyses the responses in Cycle 3 to address the third sub-research question. The reader is reminded that the numbering is used to link the text to the updated figure at the end of each section to connect text analysis to each figure.

5.5.1.1 Expansion and clarification of Context Element 1: Educators

The participants expressed a desire for the designer to [1] understand the participants' needs (R1–R7). Understanding participants' needs [1] was strongly linked to the ADDIE Analysis phase (R1–R7), which is discussed in the findings and results of the ADDIE Analysis phase, later in the chapter. When asked about the respondents' need for development, every respondent (R1–R7) indicated an area of their educational practice which needs development.

Principles of [2] andragogy, including autonomy (R3, R4), relevance (R1, R3–R7) and competence (R3, R4) emerged as a clear foundation of educator training. Teachers enjoyed the experiential learning approach (R1, R3, R4, R6, R7) and contextually applied course material (R1, R3–R7). The three most prominent considerations that emerged under the theme of andragogy and understanding participant needs were [3] teachers' limited time for CPD (R1–R7); participants' preference for a course which facilitates [4] contextual implementation of coursework in their daily lives; and lastly (R1, R3–R7), a course which [5] anticipates differences in proficiency level among participants (R1 – R3, R4 – R7).

Time constraints [3] is highlighted as the biggest limiting factor for teacher CPD in the school (R1, R3, R4, R5, R6, R7). Educators have a busy school schedule (R1), with extra-mural activities (R2, R3, R4, R5 and R7) demanding a lot of time. Respondent 5 felt that “it is not possible to attend any training during the week, and sometimes not on weekends either” (R5) because of “sports, extra-mural or cultural activities” (R3, R4, R5, R7) and a need to spend time with family over weekends (R5). It is, however, important to note that Respondent 5 did complete the course and questionnaire in Cycle 3, which was implemented during the school week, indicating that a well-designed blended learning course makes CPD possible through the week, despite limitations on time.

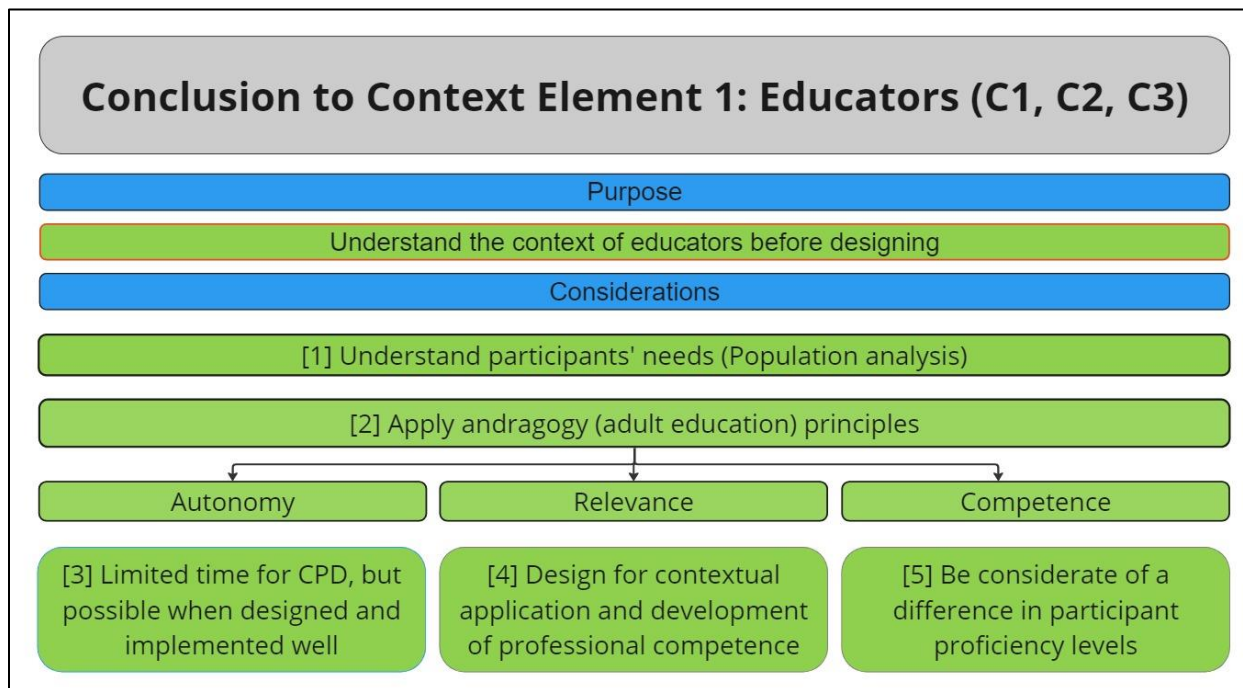
Participants preferred a course which facilitates [4] contextual application over purely theoretical programmes (R1, R3, R4, R5, R6, R7). “Implementation is immediately perceivable while theoretical programmes do not always lead to change” (R3). Three respondents indicated that they prefer a combination of theoretical and applied programmes, through emphasis was placed on implementation of theory (R4, R5, R6).

Lastly, participants believe that [5] staff members' proficiency levels differ (R1, R2, R3, R5, R6, R7). Respondents shared positive and negative views on difference in proficiency. Negative views on difference in proficiency include: “The most proficient staff members are required to do bulk of the work” (R1); “not all staff have the same drive and motivation” (R2); and lastly, in the experience

of participant 7, different age groups “think differently and it causes conflict” (R7). These responses are indicative of a need to upskill ‘less proficient’ staff members and foster a culture of viewing difference and conflict as a necessary and positive element of school development. However, participants also shared, as established in Cycle 1 and Cycle 2, that differences in proficiency levels can have a positive impact on engagement and collaborative learning. “We have different skills” (R1). Everyone can contribute to the school in a unique way (R5), which can “lead to mentoring where teachers are willing” (R3), especially where “different age groups can learn from each other” (R7).

Figure 5.5 illustrates the updated considerations of Context Element 1: Educators, after analysis of responses to the research questionnaire in Cycle 3.

Figure 5.5
Conclusion to Context Element 1 (Cycles 1, 2 and 3)



Source: The researcher

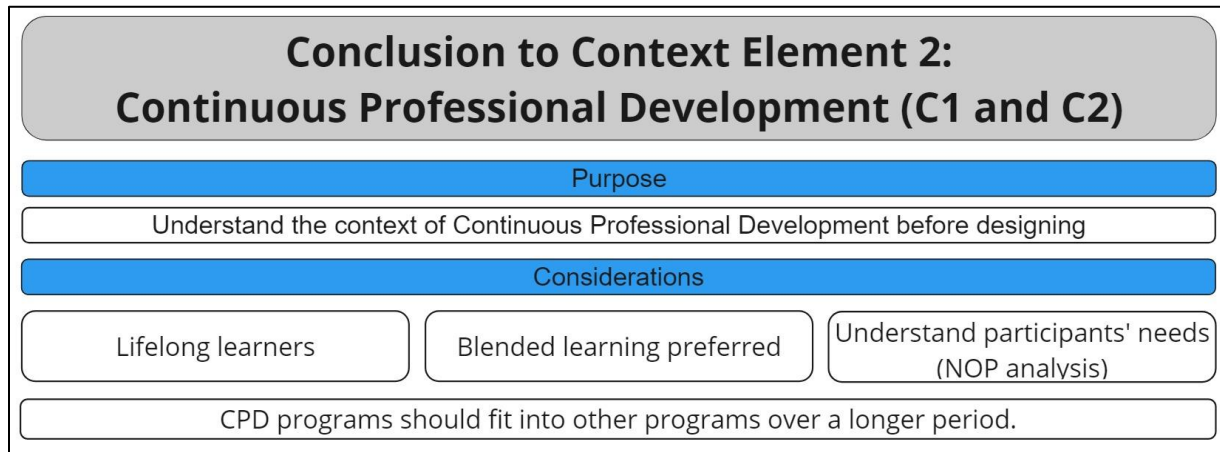
The purpose and five considerations for the context of educators are confirmed in Cycle 3. Participants highlighted that designers need to understand the context and needs of participants when designing a course. Principles of andragogy, limited time, application of knowledge and difference in proficiency were addressed.

In 5.5.2, the researcher addresses the considerations of Context Element 2: CPD based on the data gathered from research questionnaire C3.

5.5.2 Context: Continuous Professional Development

Figure 5.6 illustrates the current considerations and elements of Context Element 2: CPD after Cycle 1 and Cycle 2, as presented in 4.5.2.3. Following Figure 5.6, the researcher presents the analysis and findings of the survey data (Cycle 3) to induce a final revised set of elements and considerations.

Figure 5.6
Context Element 2 (Cycle 1 and Cycle 2)



Source: The researcher

The researcher draws on the findings and results from Cycle 3 to clarify and expand the considerations established in Cycle 1 and Cycle 2 for Context Element 2: CPD. The researcher also analyses the responses from Cycle 3 for emerging themes that address the third sub-research question.

5.5.2.1 Expansion and clarification of Content Element 2: CPD

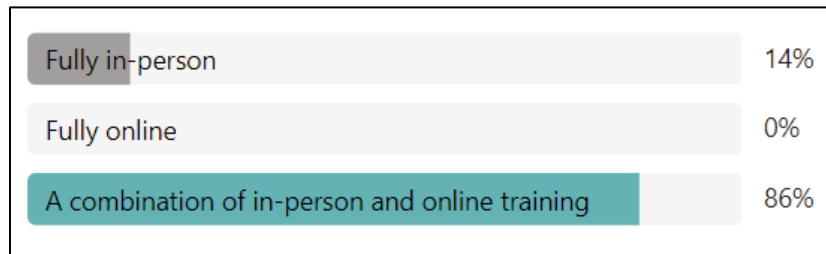
Understanding the participants' needs when designing a course was established as an essential element of CPD (R3–7). Design decisions should be informed by participants' needs for engagement (R7), flexibility (R3, R4), learning needs (R1, R5) and availability (R3, R4).

Seven educators expressed the desire to participate in CPD as lifelong learners. Respondent 4 described lifelong learning as the core of education. "We have to stay updated", especially when it comes to teaching with technology (R1). Teachers need to improve their skillset (R2), set an example to learners (P3), keep their subject content and teaching methods relevant (R5), remain adaptable (R6) and stay up to date with rapidly changing trends in education (R7).

Six participants prefer blended learning for CPD over pure F2F teaching or online learning. Blended learning was dominant as the preferred delivery method. No respondents preferred a

purely online course, with one respondent preferring pure F2F presentation. Figure 5.7 illustrates the respondents' responses when asked which delivery method they preferred.

Figure 5.7
Preferred delivery method (Cycle 3)



Source: The researcher

Blended learning was preferred (R2–R7) because it includes irreplaceable human elements of connection and engagement (R2), while increasing flexibility and ease of access through online elements. Respondents indicated that the human (F2F) element to a course brings focus (R1), engagement (R3) and impact through connection (R4 and R5). Suggestions that F2F engagement is perceived to be more impactful (R4 and R5) indicate strong links to the remarks from P1 in Cycle 2, indicating that it might be easier to inspire people when meeting in person. “I get distracted during online courses; in-person training helps me stay focused” (R1). During in-person training, questions can easily be asked and answered (R3), while online training gives (participants) the flexibility to schedule according to their daily planner (R3).

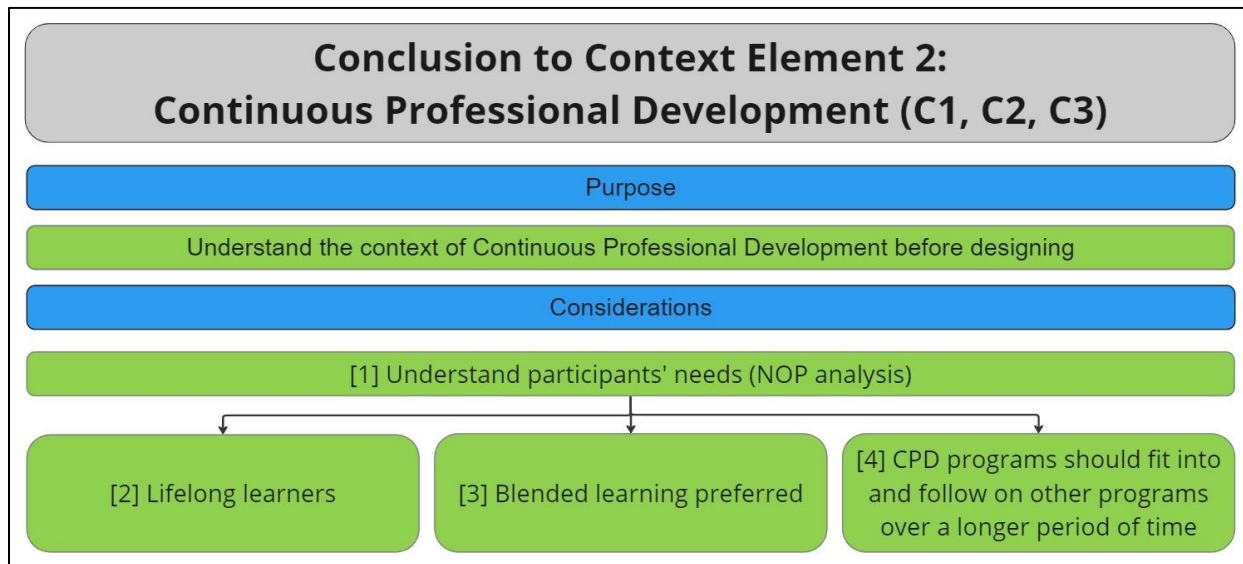
The respondents highlighted disadvantages of F2F instruction. A lack of flexibility and mobility in F2F instruction was addressed. “It is sometimes difficult to attend physical training so it will be great to have an online option” (R2). “Online training gives the flexibility to schedule according to your daily planner” (R3) which allows the participant to complete the course in their own time (R4). The benefits of online learning were primarily associated with flexibility and accessibility (R2, R3, R4), evaluation of participation (R6) and better retention (R7).

Designers should be in touch with participants' needs pertaining to the frequency and structure of training. Six participants preferred a series of related and sequential training programmes through the course of a year over a once-off training programme. Modularity was addressed by Respondent 4. “Smaller bites make it (the course content) more digestible” (R4). A series of related training programmes that follow one another allow teachers to stay up to date (R2), makes growth observable (R7) and monitorable (R3) and allows teachers to learn and develop flexibly

(R5). CPD programmes should be structured so that participants have access to the content covered in previous sessions to understand new sessions are optimally implemented (R5).

Figure 5.8 illustrates the considerations of Context Element 2: CPD, after analysis of the research questionnaire in Cycle 3.

Figure 5.8
Conclusion to Context Element 2 (Cycles 1, 2 and 3)



Source: The researcher

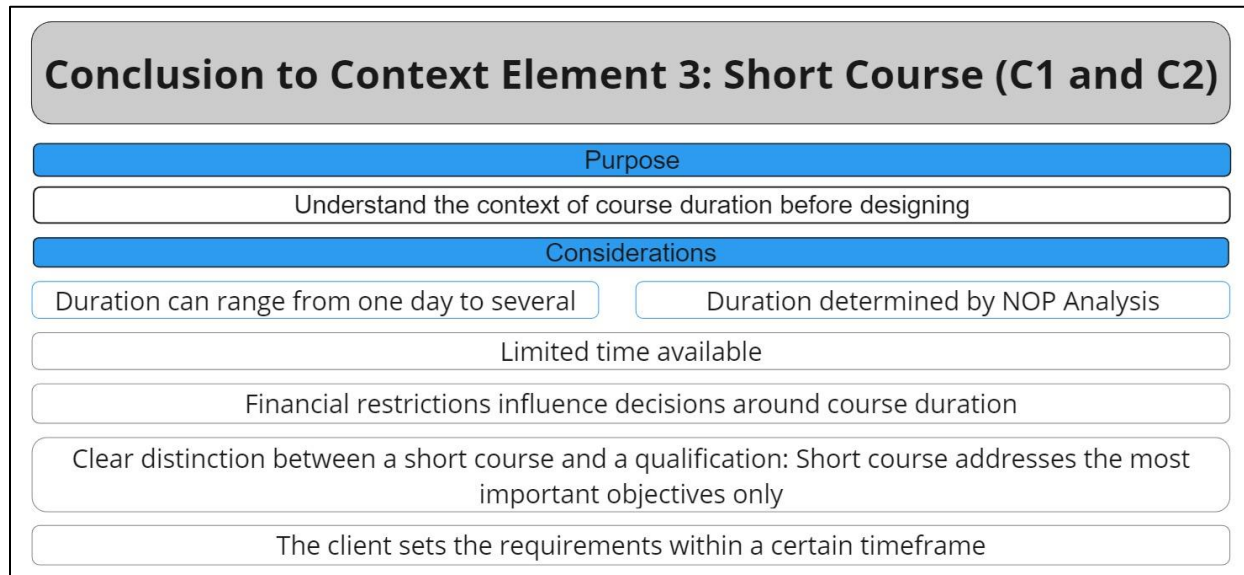
Figure 5.8 illustrates that Cycle 3 confirmed the purpose and four considerations for the context of CPD as induced in Cycle 1 and Cycle 2. According to participants in Cycle 3, understanding the needs of the participants means that designers understand that adults are [2] lifelong learners, but [3] prefer blended learning to facilitate CPD; especially when short programmes are interlinked and follow one another.

The researcher will now address the considerations of Context Element 3: Short course, based on the data gathered from research questionnaire C3.

5.5.3 Context: Short course

Figure 5.9 illustrates the current considerations and elements of Context Element 3: Short course after Cycle 1 and Cycle 2, as presented in 4.5.3.3. Following Figure 5.9, the researcher presents the analysis and findings of the survey data (Cycle 3) to induce a final revised set of elements and considerations.

Figure 5.9
 Context Element 3 (Cycle 1 and Cycle 2)



Source: The researcher

The researcher draws on the findings and results from Cycle 3 to clarify and expand the considerations established in Cycle 1 and Cycle 2 for Context Element 3: Short courses. The researcher also analyses the responses from Cycle 3 for emerging themes that address the third sub-research question.

5.5.3.1 Expansion and clarification of Context Element 3: Short courses

As discussed in all Context Elements thus far in Cycle 3, it is essential to understand the context within which the short course programme will be presented so that the context can inform design decisions around course duration. The designer must understand the [1] needs of the participants and let participants' needs guide decisions around course duration. This will be discussed in more detail later in the ADDIE Analysis phase.

There was [2] wide disparity in responses when asked what the ideal duration of a short learning programme should be at the school. This supports Cycle 1 and Cycle 2 findings on course

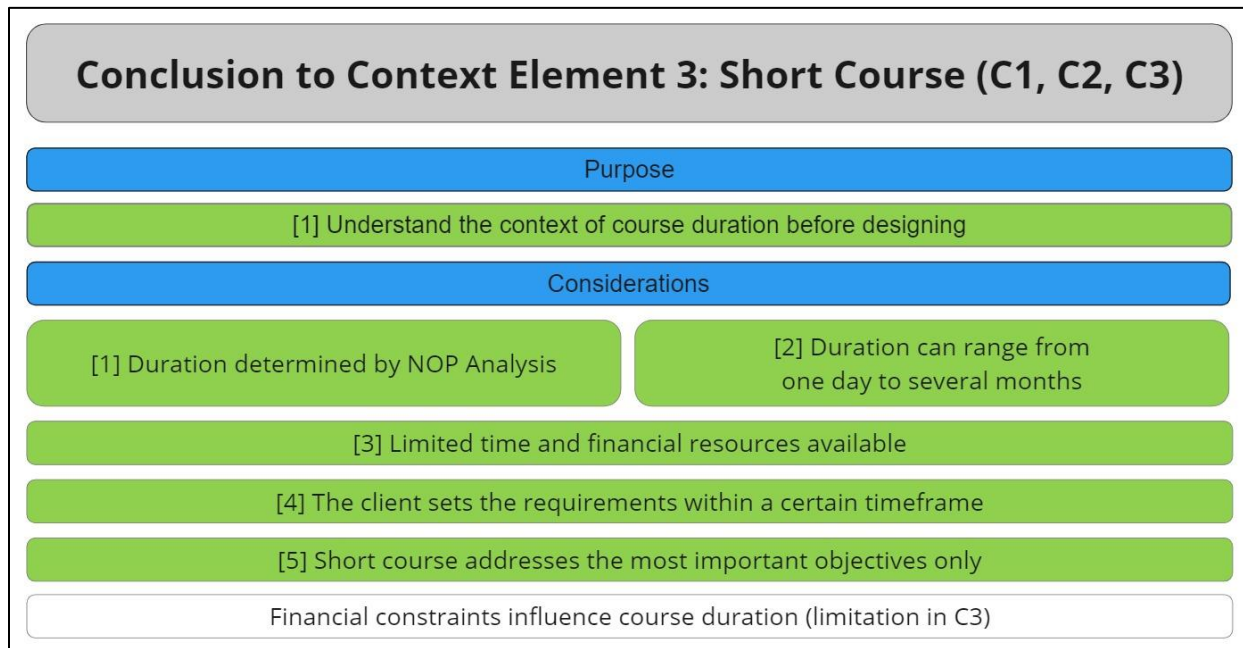
duration. Responses varied from as little as one hour (R2) to one or more days (R7), one or more weeks (R2, R5), one or more months (R1), and several months (R3).

Educators have very limited time available [3] for participation in CPD programmes. “Time constraints are a real issue” (R4). The course duration can vary, though it should provide enough time for participants to complete the required activities [4]. “A programme should have enough time to complete with our busy schedules and give you enough time to complete all activities” (R1). Educators have a full-time job and therefore CPD should cover only the most important objectives [5]. Presenting a course over a few months allows a participant time to learn something new while doing their work (P5). Presenting a course over a few months “allows for participation even though programmes are full, so that planning can be done in advance” (R3).

No mention was made of financial restrictions and their influence on course duration since the course presented in Cycle 3 was free of charge. This is therefore not an indication of irrelevance, but rather a limitation of the study.

Figure 5.10 illustrates the conclusion to considerations of Context Element 2: CPD, after analysis of the research questionnaire in Cycle 3.

Figure 5. 10
Conclusion to Context Element 3 (Cycles 1, 2 and 3)



Source: The researcher

Figure 5.10 illustrates that Cycle 3 confirmed the purpose and five considerations for the context of a short course as induced in Cycle 1 and Cycle 2. No new considerations emerged in Cycle 3. One consideration was omitted in Cycle 3, but this was a limitation of the research cycle, since the course was presented free of charge.

In the following section, the researcher addresses the considerations and elements of the two key research focus areas, namely Design Elements and Blended learning. The researcher performs data analysis on the data gathered from research questionnaire C3 to expand and clarify the considerations and elements of the key research areas in this study.

5.6 Build

For the Build phase, the researcher designed and implemented a newly designed blended CPD short course for educators. The course was designed to address a problem and need identified during the Focus and Understand phases. Needs analysis was done prior to course commencement as described by 2.10, 5.3 and 5.4.

The researcher used the elements and considerations induced in Cycle 1 and Cycle 2 to build and implement a new course. In section 5.6.1, the researcher analyses the data gathered through

Cycle 3 to establish a final set of elements and considerations. These findings and results from the study will form the conclusion to the study.

The researcher starts by analysing data from Cycle 3 pertaining to Research focus area (1): Design Elements.

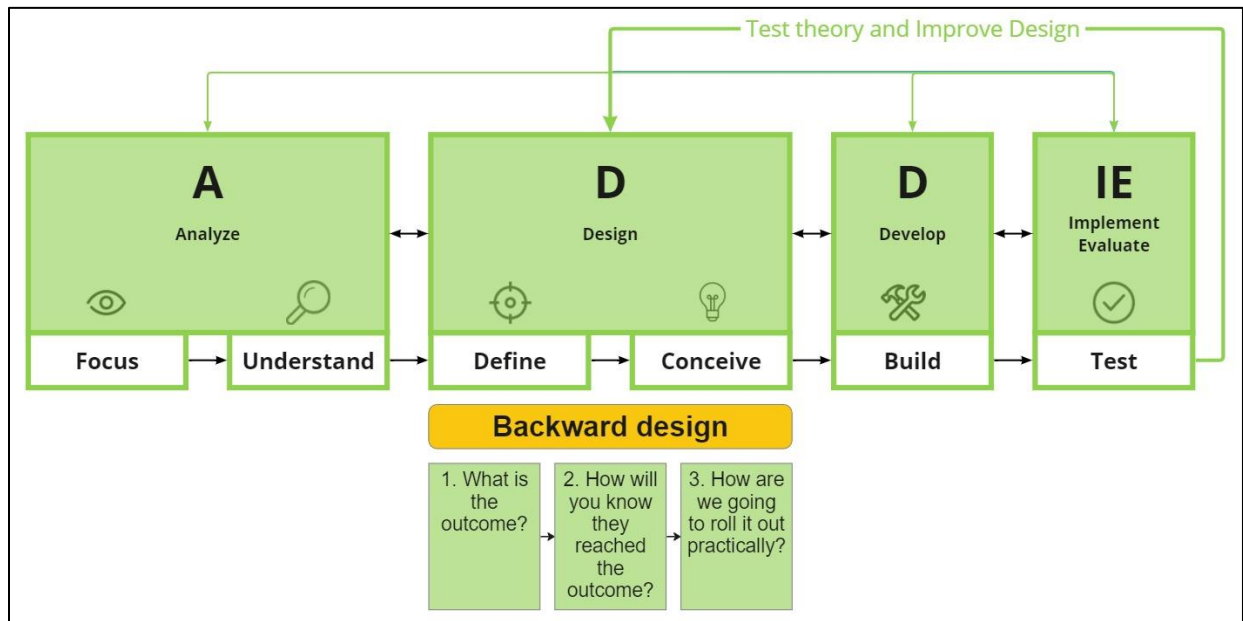
5.6.1 Design Elements

In this section, the researcher draws on the data gathered through Cycle 3 to address the third sub-research question for design elements. The researcher will clarify and expand the considerations and elements established in Cycle 1 and Cycle 2 to induce an updated set of design elements (E3). The researcher will address ID models and each individual phase of the ADDIE ID Model, including Analysis, Design, Development, Implementation and Evaluation.

5.6.1.1 Instructional Design Models

The use of ID models, and specifically the ADDIE Model of ID was discussed in Chapters 3 and 4 to establish a set of considerations and elements when designing a blended CPD short course for educators. The ADDIE Model was implemented as a finding of Cycle 1, design elements. In Cycle 2, backward design emerged as the backbone of the ID process for the experienced course designers. The researcher drew connections between the ADDIE Model and the backward design model in Cycle 2. These considerations and elements are presented by Figure 5.11.

Figure 5. 11
Instructional Design Model (Cycle 1 and Cycle 2)



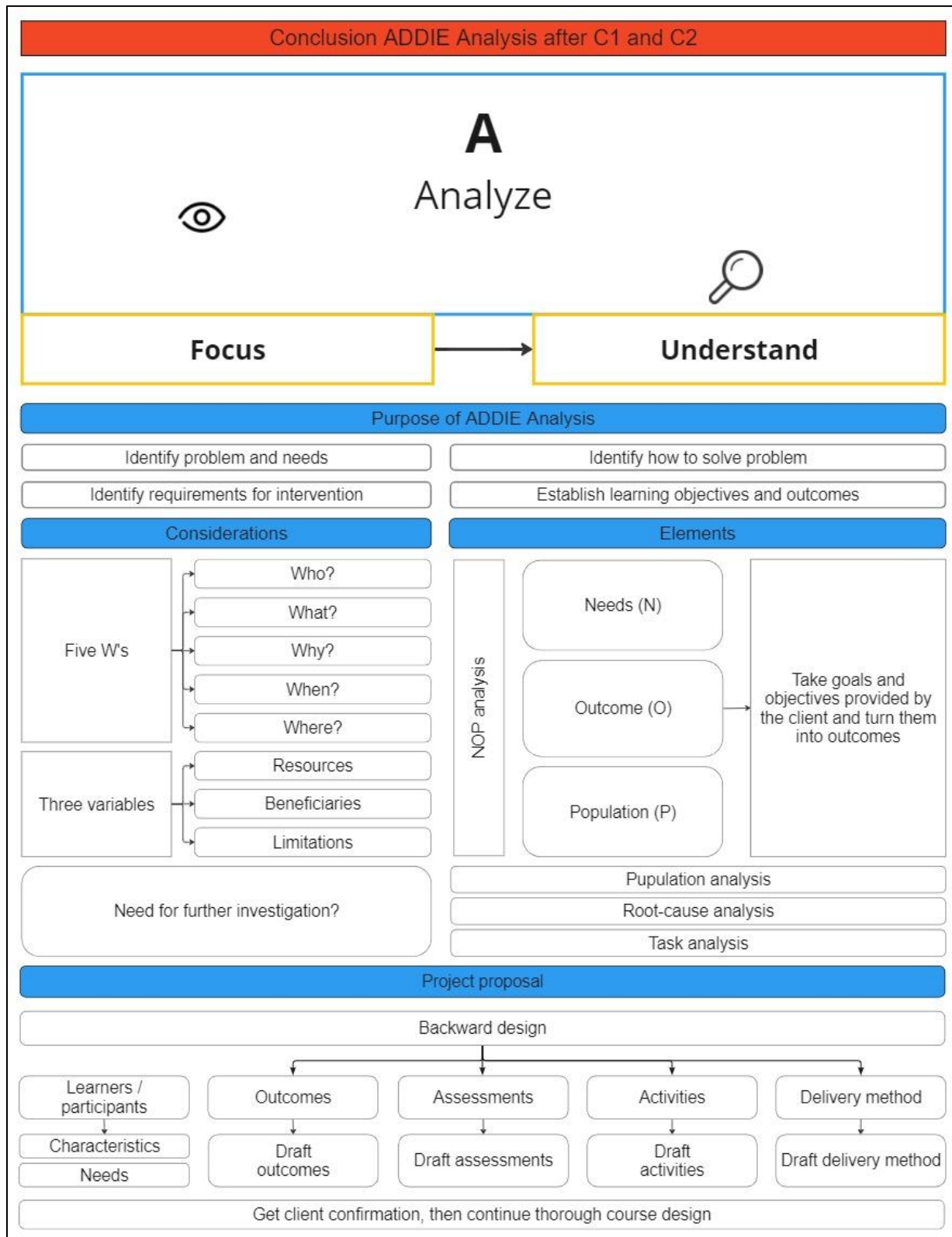
Source: The researcher

The researcher addresses each individual component of the ADDIE Model of ID as a foundational ID model. Elements of backward design are addressed in the Design Phase and mentioned in other phases. In the next section, the researcher addresses ADDIE Analysis.

5.6.1.2 Phase 1: Analysis

The Analysis Phase in the ADDIE Model of ID was discussed in Chapters 3 and 4 to induce confirmed current and emerging considerations and elements. Figure 5.12 illustrates the current considerations and elements of ADDIE Analysis after Cycle 1 and Cycle 2, as presented in 4.6.1.2 (C). Following Figure 5.12, the researcher presents the analysis and findings of the survey (Cycle 3) to induce a final revised set of elements and considerations.

Figure 5.12
ADDIE Analysis (Cycle 1 and Cycle 2)



Source: The researcher

The researcher draws on the findings and results from Cycle 3 to clarify and expand the considerations and elements established in Cycle 1 and Cycle 2 for ADDIE Analysis. The researcher also analyses the responses from Cycle 3 for emerging themes that address research question 3 and subsequently the main research question.

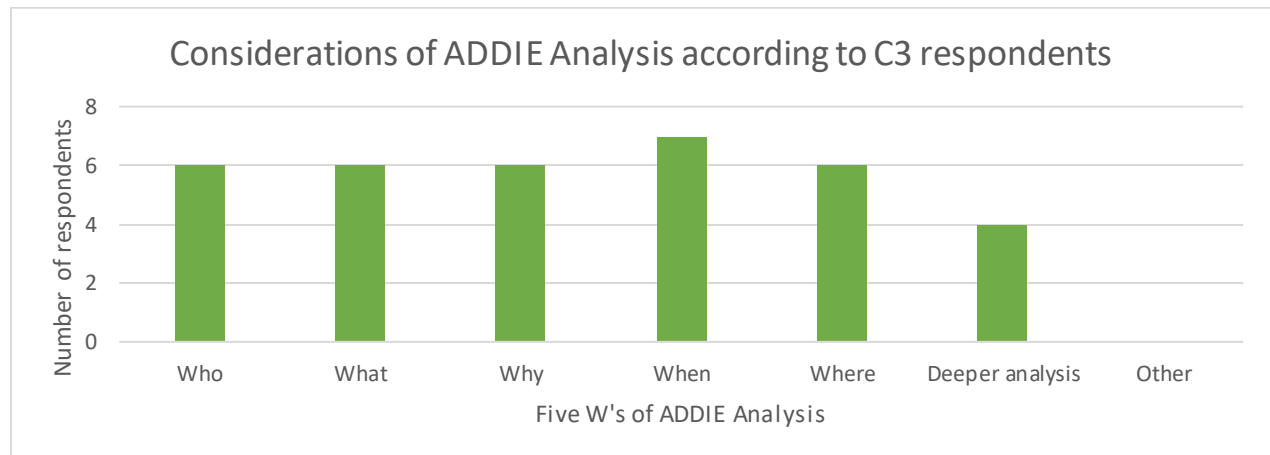
A) Expansion and clarification of ADDIE Analysis

Three considerations, namely the [1] Five W's; [2] limitations and [3] need for further investigation were established in Cycle 1 and Cycle 2.

The Five W's, namely (1) Who; (2) What; (3) Why; (4) When; and (5) Where, were established as core considerations of pre-design analysis (R1–R7). The need for further investigation through population analysis, root-cause analysis, and task analysis, identified in Cycle 1, was selected as Analysis considerations by R2, R3, R6 and R7. This supports the indication that further investigation might be needed, although it is only needed in some courses. Need for further investigation is not elemental and is established as a non-essential consideration; therefore, the researcher will not be investigating this consideration beyond the findings of Cycle 1.

Figure 5.13 illustrates responses when respondents were asked to select the considerations that designers should keep in mind before presenting a course at their school.

Figure 5. 13
Considerations of ADDIE Analysis (Cycle 3)

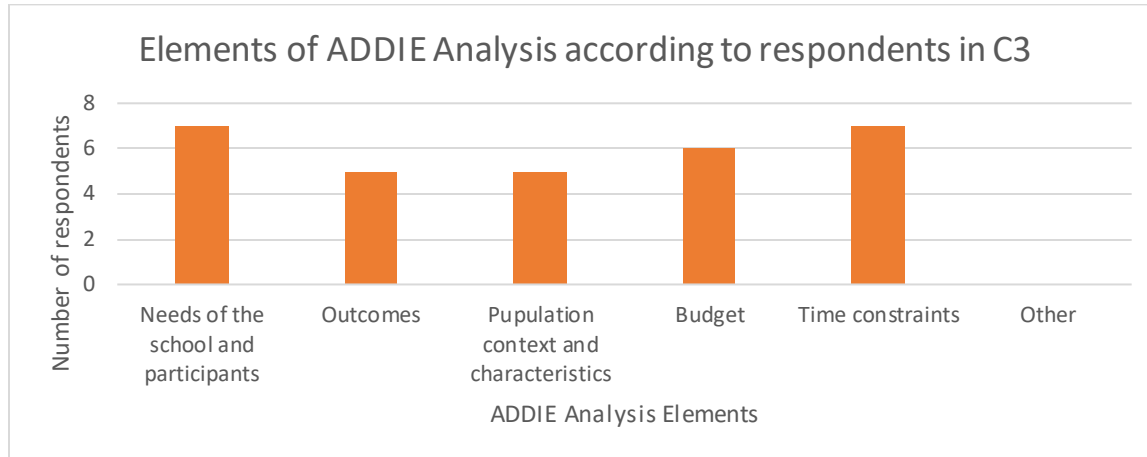


Source: The researcher

When asked to select the elements that designers should keep in mind before presenting a course at the school, the NOP analysis, as well as time and budget limitations, were confirmed as elements of ADDIE Analysis. Understanding the needs of the school and participants, as well as time constraints were identified as elemental (R1–R7). Budget is also an important element of

ADDIE Analysis, with six responses, followed by analysis of the population and outcomes, with five responses. Figure 5.14 illustrates the participants' responses.

Figure 5. 14
Elements of ADDIE Analysis (Cycle 3)

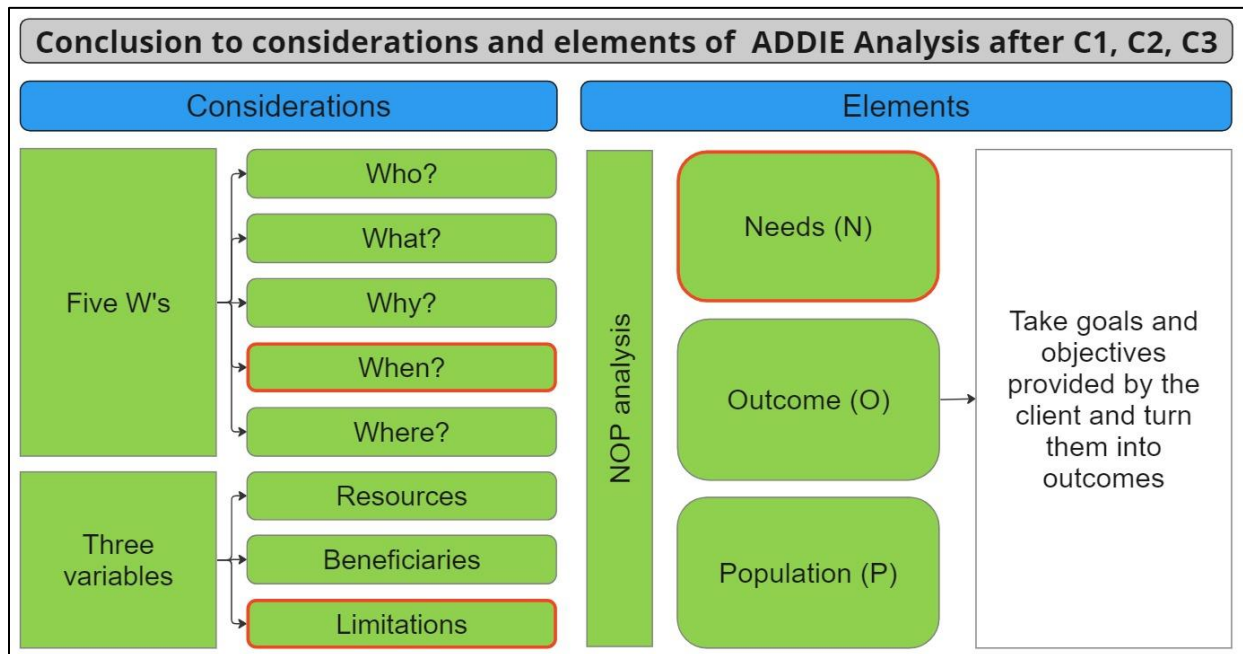


Source: The researcher

Respondent 2 indicated that the designer should also analyse barriers to learning and participation that learners might experience. This supports the remark by P1 in Cycle 2, who mentioned learning barriers when discussing restrictions around internet access and electricity. The researcher therefore establishes analysis of learning barriers as an element of ADDIE Analysis.

Figure 5.15 illustrates an updated set of considerations and elements of ADDIE Analysis, following Cycle 3 data analysis.

Figure 5.15
Considerations and elements of ADDIE Analysis (Cycles 1, 2 and 3)

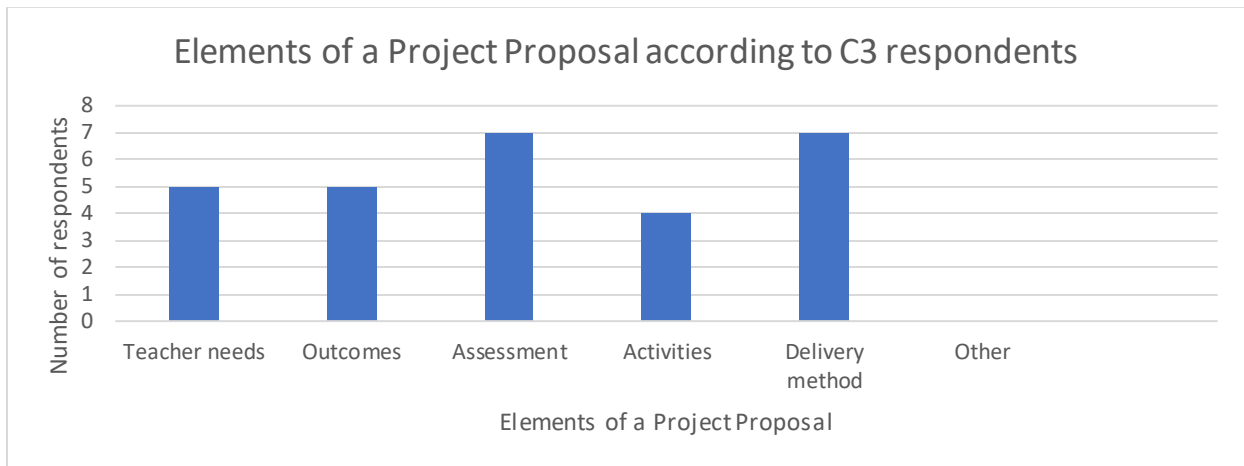


Source: The researcher

Figure 5.15 shows that the timing of course implementation (When), Needs analysis, and the limitation of time constraints, are highlighted with red borders to indicate that these considerations and elements emerged as critical elements and considerations of ADDIE Analysis. Analysis of learning barriers was added as an element of ADDIE Analysis and is marked orange. The Five W's, three variables, and NOP analysis, were confirmed as elements and considerations in Cycle 3.

Figure 5.16 illustrates the elements of the project proposal based on responses to the C3 questionnaire.

Figure 5. 16
Elements of a Project Proposal (Cycle 3)

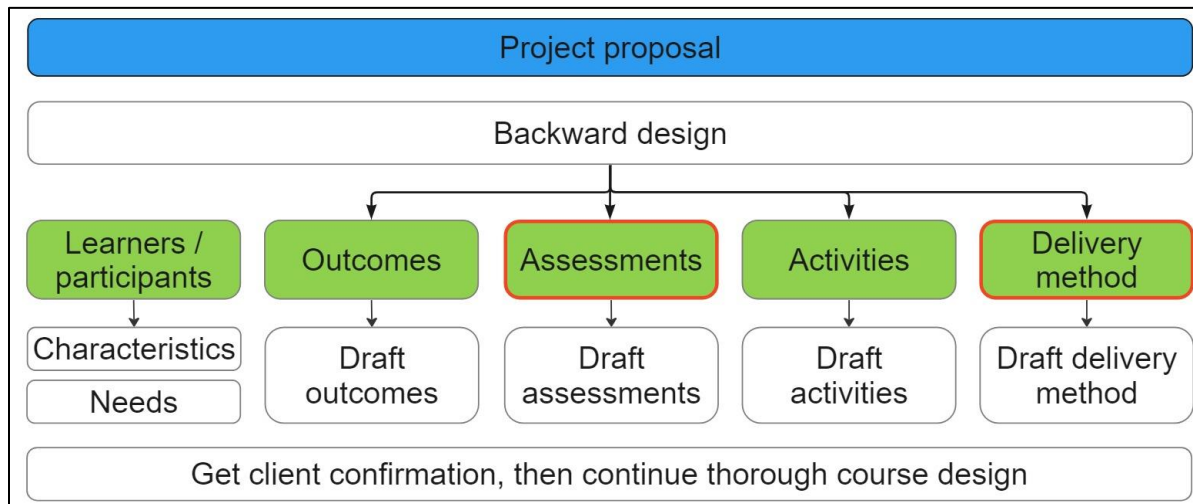


Source: The researcher

Figure 5.16 illustrates the project proposal as an element of ADDIE Analysis. All five elements of the project proposal were confirmed by respondents in Cycle 3. An (1) assessment plan and (2) the delivery method emerged as perceived essential elements of the project proposal by Cycle 3 respondents. Backward design was not mentioned as an element of the project proposal but is seen as an industry-specific term which would not have emerged from a participant perspective, but rather a designer perspective. Significant mention was made of backward design in Cycle 2, prompting the researcher to maintain backward design as a core element of the project proposal.

Figure 5.17 illustrates the project proposal after Cycle 3.

Figure 5.17
ADDIE Analysis Project Proposal (Cycles 1, 2 and 3)



Source: The researcher

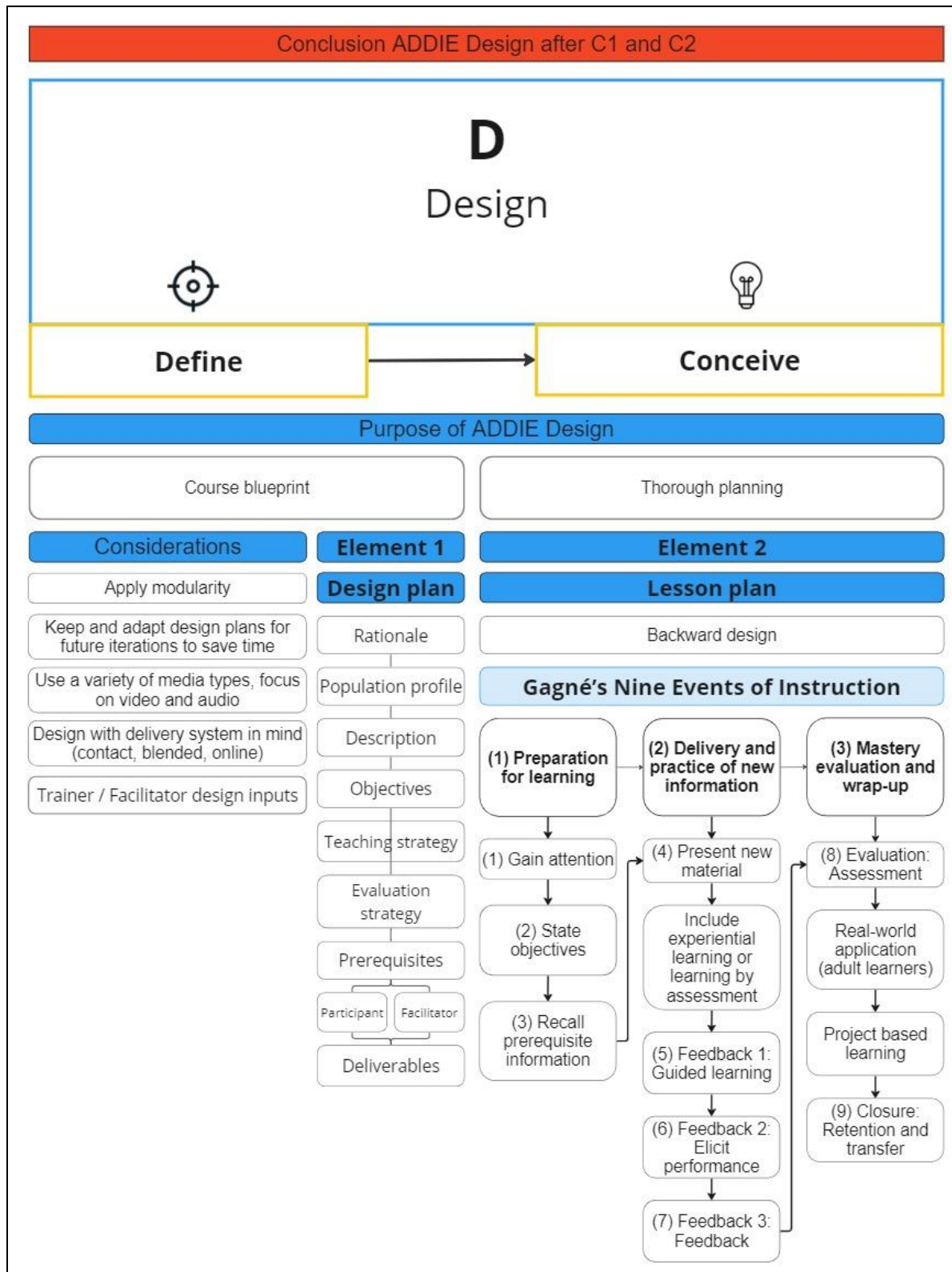
Figure 5.15 illustrates the five confirmed elements of the project proposal in Cycle 3. Backward design, draft versions of outcomes, and client liaison, were not addressed. The researcher realises that a project proposal is not of direct concern to participants, but rather to the designer, which explains its omission of these elements in the Cycle 3 data.

In the following section, the researcher analyses data gathered from participants in Cycle 3 about the ADDIE Design Phase.

5.6.1.3 Phase 2: Design

The Design Phase in the ADDIE Model of ID was discussed in Chapters 3 and 4 to induce confirmed current and emerging considerations and elements. Figure 5.16 illustrates the current considerations and elements of ADDIE Design after Cycle 1 and Cycle 2, as presented in 4.6.1.3 (C). Following Figure 5.18, the researcher presents the analysis and findings of the survey (Cycle 3) to induce a final revised set of elements and considerations.

Figure 5. 18
ADDIE Design (Cycle 1 and Cycle 2)



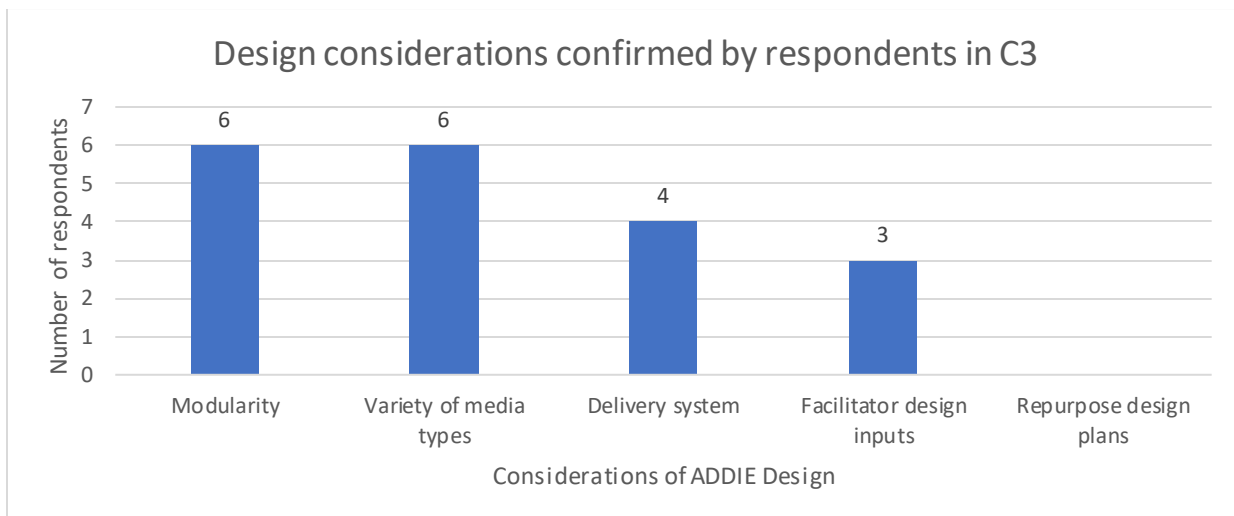
Source: The researcher

The researcher draws on the findings and results from Cycle 3 to clarify and expand the considerations and elements established in Cycle 1 and Cycle 2 for ADDIE Design below. The researcher also analyses the responses from Cycle 3 for emerging themes which address research question 3 and subsequently the main research question.

A) Expansion and clarification of ADDIE Design

Four considerations of ADDIE Design, including [1] modularity; [2] variety of media types; [3] delivery system; and [4] facilitator design inputs, were confirmed as design considerations in Cycle 3 (R1–R7). Modularity and use of a variety of media types were highlighted as essential elements, with the need to design with a delivery system in mind and involvement of the facilitator in the design process. Figure 5.19 illustrates the four design considerations which were confirmed by respondents in Cycle 3.

Figure 5. 19
Design considerations (Cycle 3)

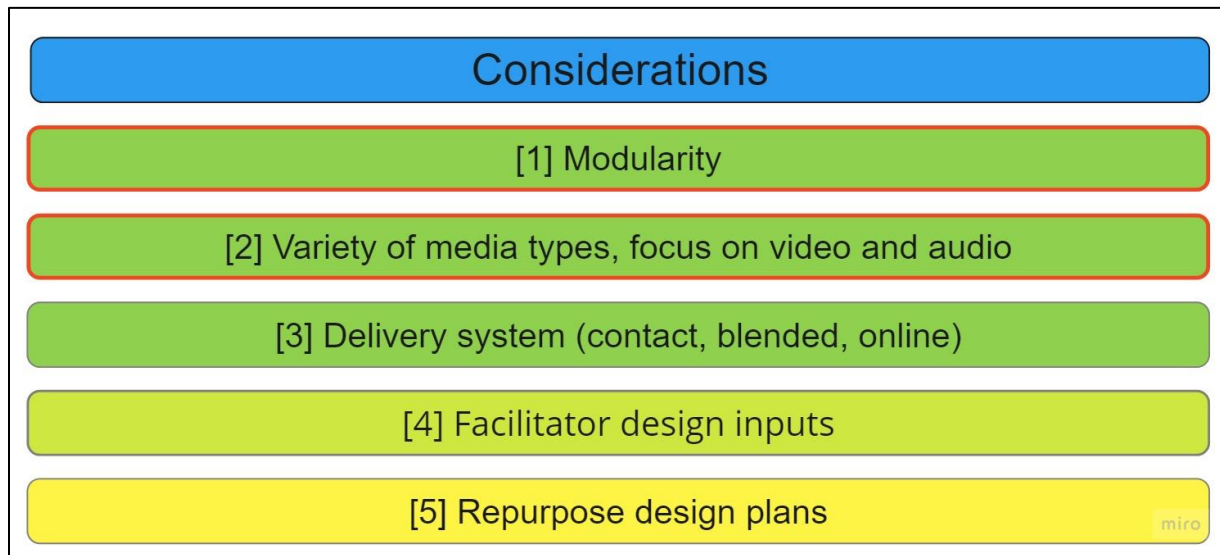


Source: The researcher

One consideration was omitted, namely, the repurposing of design plans. This consideration however purely concerns the designer, since repurposing design plans is purely intended to save the course designer time (Cycle 1 and Cycle 2) and does not affect the course participant directly.

Figure 5.20 illustrates the design considerations as clarified and expanded upon in Cycle 3. Elements marked in dark green were confirmed as considerations of the design phase. The most important considerations are circled in red, while the light green and yellow blocks are considered less important considerations by respondents in Cycle 3.

Figure 5.20
Considerations of the design phase (Cycle 3)

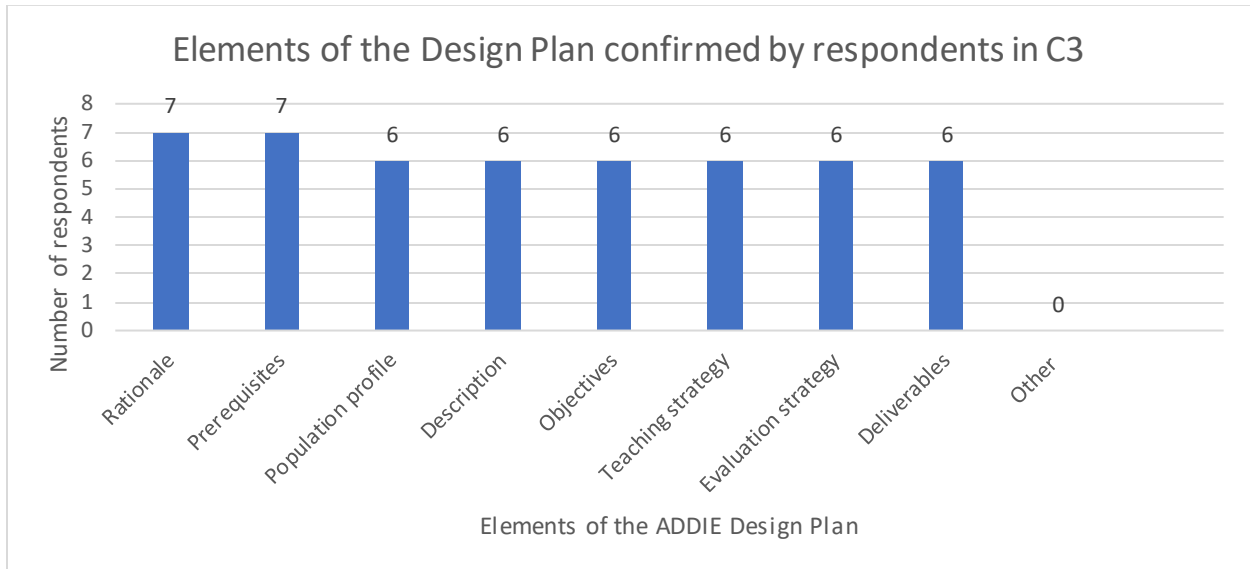


Source: The researcher

Each of the five considerations of ADDIE Development are confirmed in Cycle 3. Figure 5.20 illustrates that modularity and varying media types are perceived to be the most important considerations of ADDIE Design, while facilitator design inputs and repurposing design were perceived as less important. The researcher once again realises that these considerations are designer-specific and do not affect the participant, which might explain the contrast in responses in Cycle 2 and Cycle 3.

Following the considerations, the researcher addressed the first element of the design phase, namely the design plan. According to respondents in Cycle 3, elements of the design plan are the [1] course rationale; [2] prerequisites; [3] population profile; [4] course description; [5] objectives; [6] teaching strategy; [7] evaluation strategy; and [8] deliverables. No other design plan elements were suggested by respondents in Cycle 3. Figure 5.21 illustrates responses to the elements of the Design Plan by respondents in Cycle 3.

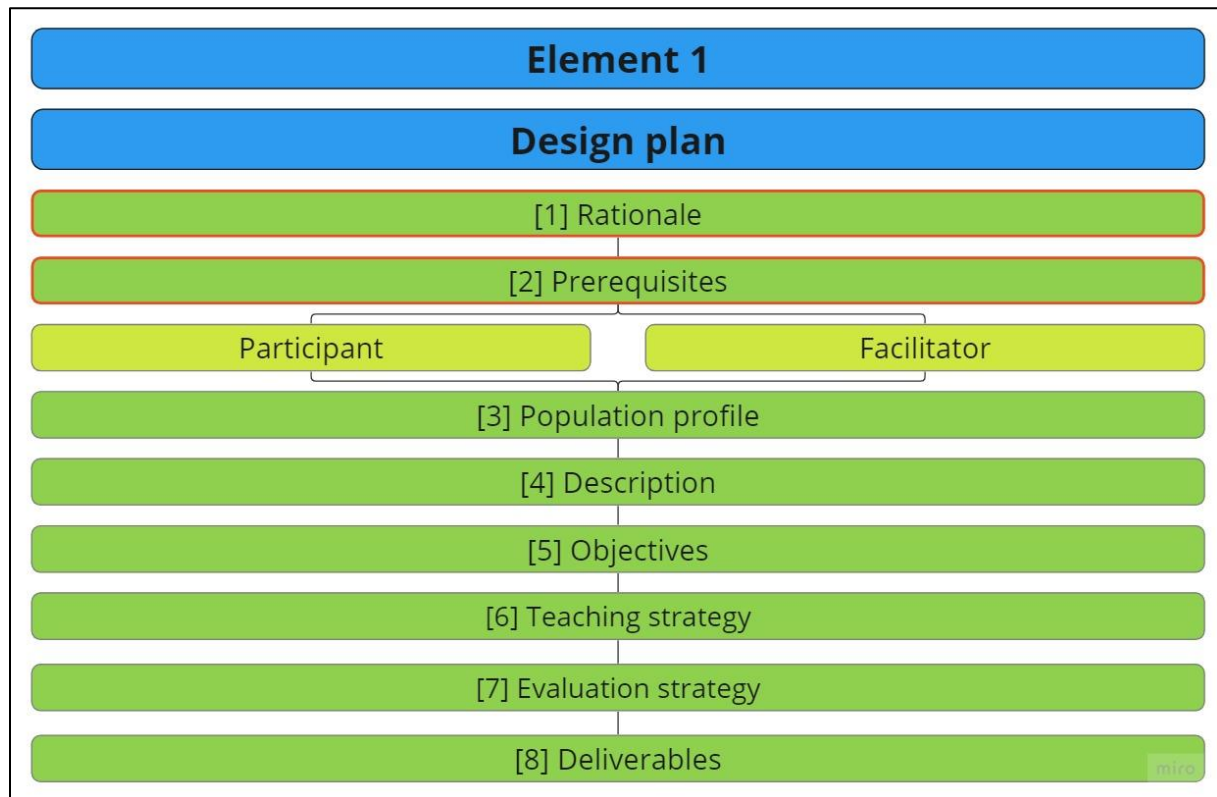
Figure 5.21
Elements of the Design Plan (Cycle 3)



Source: The researcher

Figure 5.22 presents the expanded and clarified summary of ADDIE Design after Cycle 3.

Figure 5.22
Elements of the ADDIE Design (Cycles 1, 2 and 3)

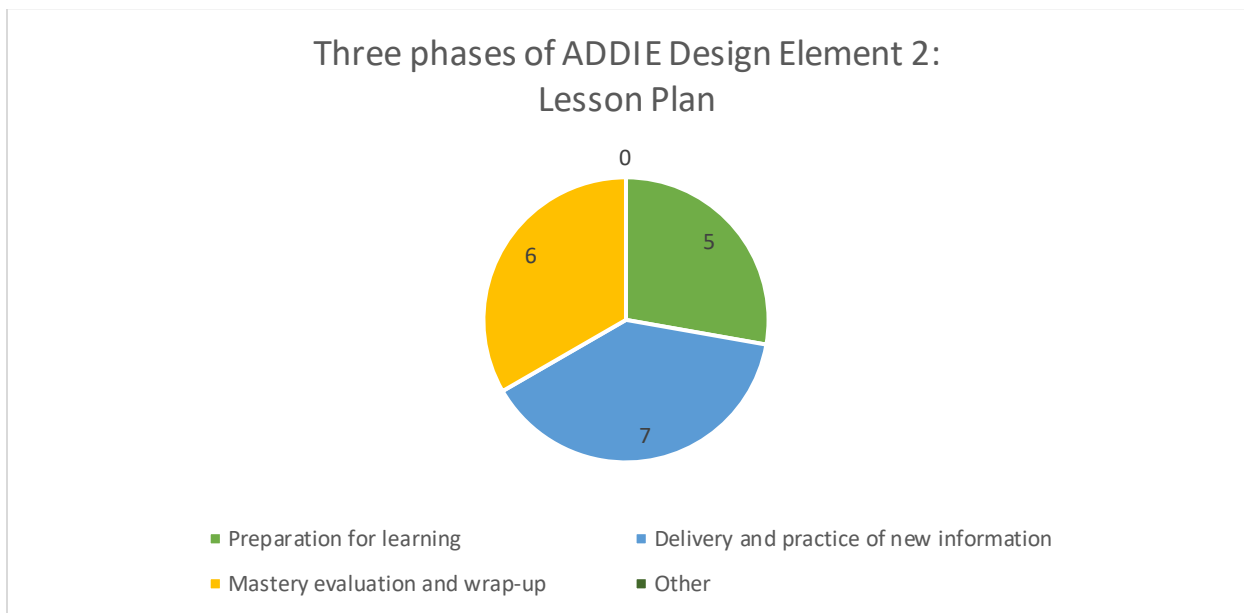


Source: The researcher

Figure 5.22 suggests that respondents prioritise the need to understand the rationale behind participating in the course, as well as the prerequisites of course participation over other elements. Each of the eight elements from Cycle 1 and Cycle 2 were confirmed in Cycle 3, with no other elements emerging in Cycle 3. A course must be designed to address the context of educators, while developing a required skill of competence, within a limited time. Focus on rationale and prerequisites suggests strong ties to Context Elements 1, 2 and 3.

Figure 5.23 confirms the three phases of Lesson Plan design according to the respondents in Cycle 3.

Figure 5. 23
Three phases of the Lesson Plan (Cycle 3)

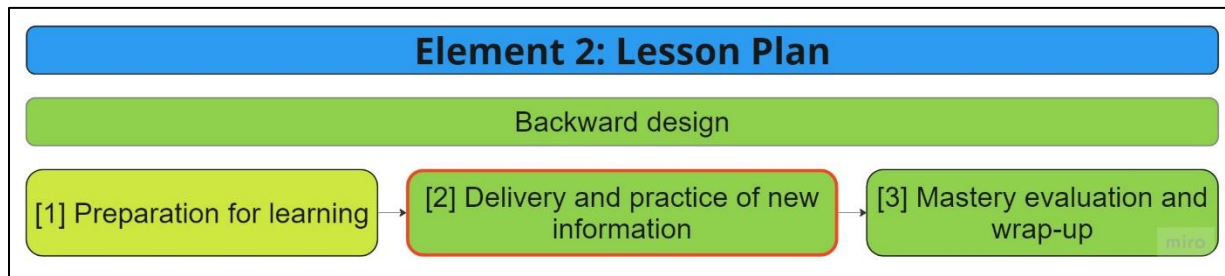


Source: The researcher

The three phases of lesson plan design were confirmed by respondents in Cycle 3, with no additional phase being suggested in addition to the three phases identified in Cycle 1 and Cycle 2. Phase 2: Delivery and practice of new information was highlighted as an essential element of ADDIE Design. Phase 3: Mastery, Evaluation and Wrap up, and Phase 1: Preparation for learning were also highlighted as elements of ADDIE Design.

Figure 5.24 illustrates the three phases of the ADDIE Lesson Plan Design as confirmed in Cycle 3.

Figure 5.24
Confirmation and clarification of Lesson Plan (Cycle 3)

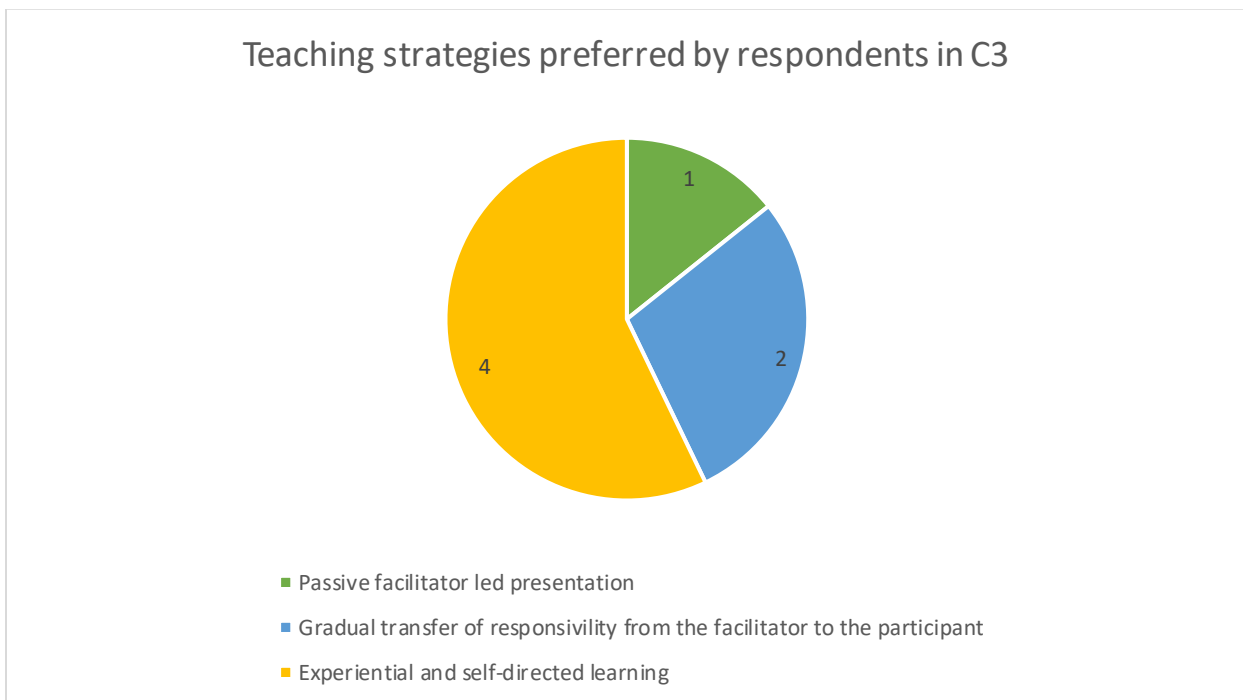


Source: The researcher

All three learning events were confirmed in Cycle 3, with Event 2: Delivery and practice of new information, perceived as the most important element of Element 2: Lesson Plan design.

Figure 5.25 presents the responses to the most effective teaching strategies in the course.

Figure 5.25
Teaching strategies (Cycle 3)



Source: The researcher

When asked about the ideal teaching strategy for course design, experiential and self-directed learning was perceived as the preferred teaching strategy (R1, R4, R6, R7). Two respondents indicated that they prefer that the facilitator gradually transfers responsibility from the presenter to the participants through the course (R3, R5), while only one respondent indicated a preference

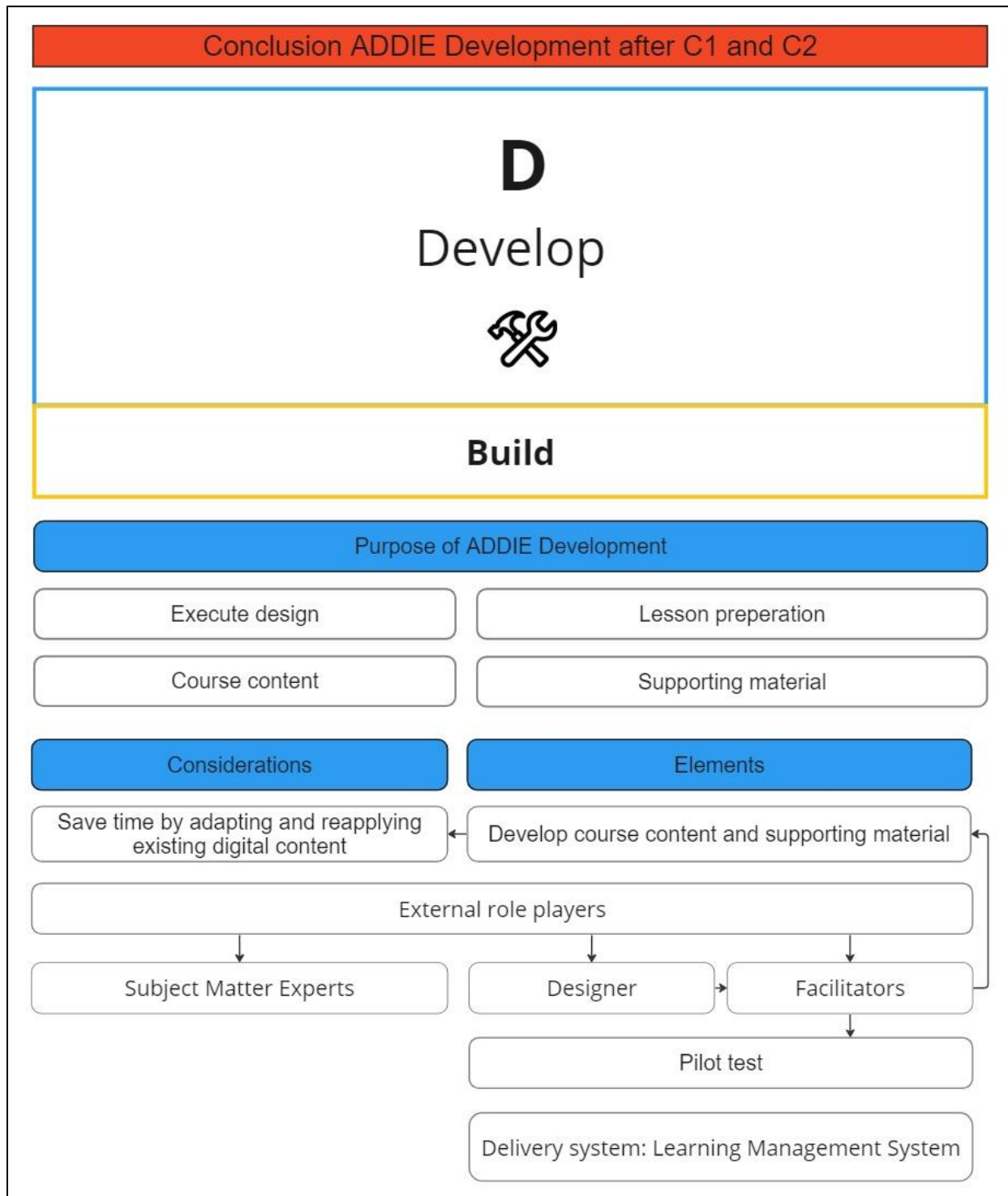
for passive, facilitator-led course design (R2). This finding supports the preference for experiential learning recommended by the designers in Cycle 2 and is in contrast with the gradual transfer of responsibility approach suggested by Cycle 1.

In the following section, the researcher analyses data gathered from participants in Cycle 3 about the ADDIE Development Phase.

5.6.1.4 Phase 3: Development

The Design Phase in the ADDIE Model of ID was discussed in Chapters 3 and 4 to induce confirmed current and emerging considerations and elements. Figure 5.26 illustrates the current considerations and elements of ADDIE Development after Cycle 1 and Cycle 2, as presented in 4.6.1.4 (C). Following Figure 5.26, the researcher presents the analysis and findings of the survey (Cycle 3) to induce a final revised set of elements and considerations.

Figure 5. 26
ADDIE Development (Cycles 1, 2 and 3)



Source: The researcher

The researcher draws on the findings and results from Cycle 3 to clarify and expand the considerations and elements established in Cycle 1 and Cycle 2 for ADDIE Development. The

researcher also analyses the responses from Cycle 3 for emerging themes which address research question 3 and subsequently the main research question.

A) Expansion and clarification of ADDIE Development

Three themes of the ADDIE Development phase were addressed in Cycle 3, namely [1] development of a variety of content types; [2] the role of internal and external role players; [3] the use of an LMS as a delivery system; and lastly [4] the pilot test.

Table 5.3 illustrates respondents' ranking of preferred content type and delivery method.

Table 5.3
Preferred content types and delivery method (Cycle 3)

Rank	Delivery method
1	A combination of various text, audio, video, picture, and facilitator-led training.
2	Facilitator-led verbal training.
3	Use of an LMS such as Google Classroom as the primary place of instruction.
4	Video
5	Audio in the form of recordings of presentations, music.
6	Text in the form of textbooks, printouts.
7	Pictures

Source: The researcher

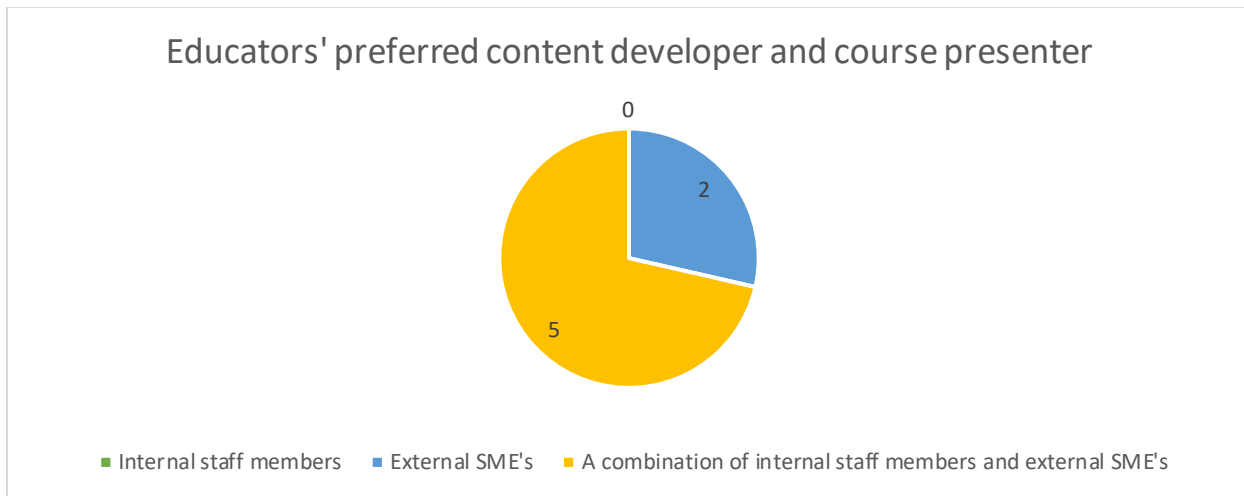
Table 5.3 illustrates participants' preferences for a blended learning approach that combines various media types. Facilitator-led training ranks very high, signifying the participants' perceived need for human connection and support. It was interesting to see technology-integrated delivery systems such as an LMS, video, audio and recordings rank higher than text, textbook and printouts.

A discussion on data from Cycle 3 on the ADDIE Development phase continues. A summary of findings is presented in Figure 5.29 at the end of the discussion.

The use of a variety of media types [1] emerged as an element under the theme of content and supporting material development in the ADDIE Development phase. When asked to use a ranking system to indicate which content type respondents preferred, use of a variety of content types [1], including text, audio, video, and facilitator-led training emerged as dominant preference. Facilitator-led training was preferred over the isolated use of an LMS. Content and media were ranked in order of preference from most preferred to least preferred: video, audio, text and lastly pictures.

Figure 5.27 illustrates participants' preferences relating to course development and implementation.

Figure 5. 27
Educators' preferred content developer and course presenter (Cycle 3)



Source: The researcher

The involvement of external role players [2] such as SMEs was established as an element of ADDIE Development. R2–R6 preferred involvement of a combination of internal staff members and external SMEs in course development and delivery, while R1 and R7 preferred external SMEs only. No respondents preferred sourcing of internal staff members as sole developers and presenters. Respondents preferred involvement of SME's because they bring a new objective perspective (R1, R2, R3, R6, R7) to the school which makes the content more interesting (R1, R7). External SME's make participants more open to learning (R7). The theme of collaboration and sharing of expertise among peers was a prominent theme and reason for involvement of internal staff members. “A staff member has insight in our school's specific needs” (R3) and “we cannot overlook the skill sets of those who we teach with” (R4). “It is encouraging to see experts within your own school present information” (R6).

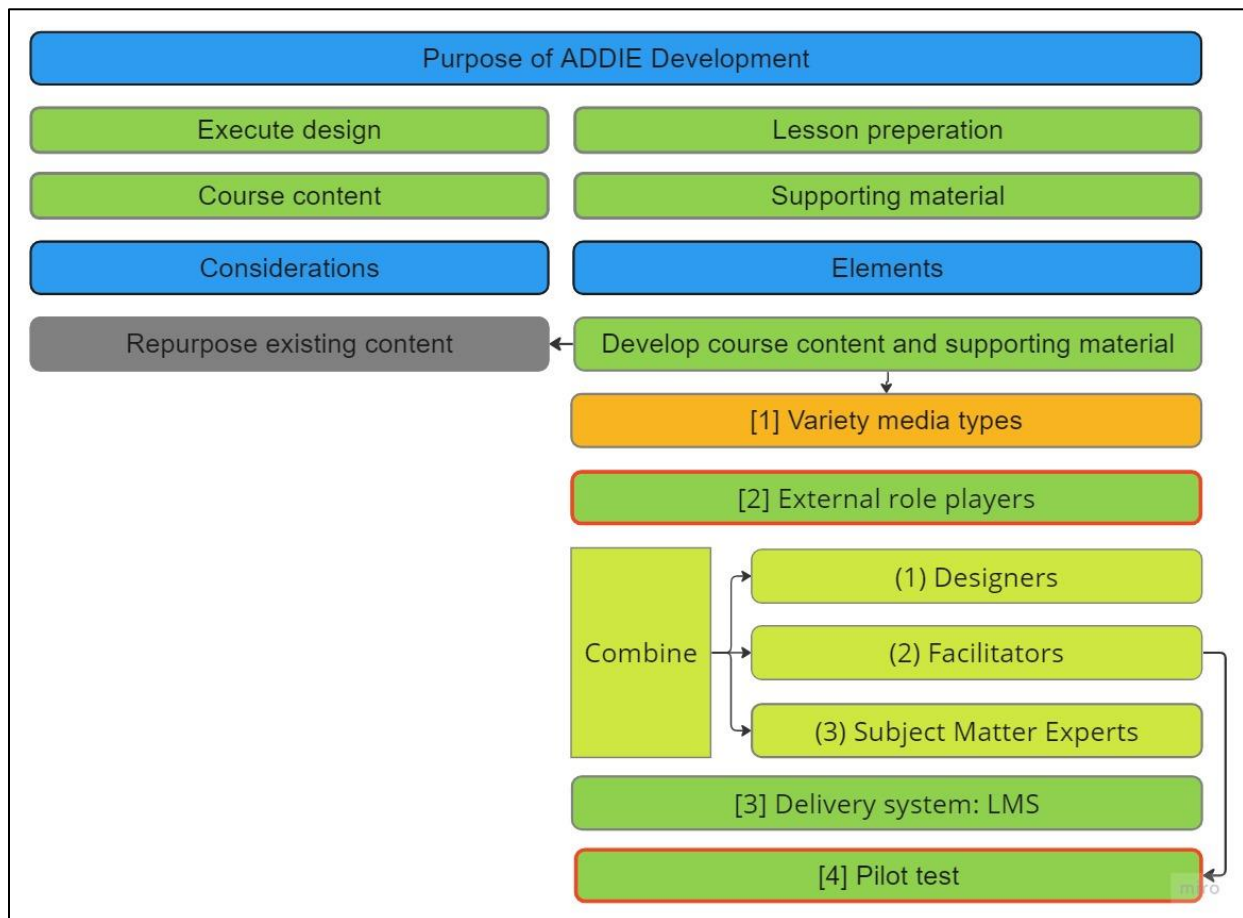
The use of an LMS [3] as a delivery method for course content was confirmed as an element of the ADDIE Development phase (R1–R7).

Lastly, a pilot test [4] forms an essential part of the development phase. “Excellence is key. Content and presentation are equally important” (R6). The designer should “ensure that the content is valid” (R1) and can be implemented (R1, R5) such that participants will learn through the course (R7). It is important to identify and eliminate design and development errors (R2 and R3) and ensure that the course addresses the desired outcomes (R3, R7). Poor design and implementation frustrate participants (R5 and R6) and can be perceived as a waste of time (R5).

Repurposing of existing course content to save time in the development process was not addressed in Cycle 3, since course participants were not involved in course development. Data collected from respondents in Cycle 3 would therefore not contribute to the findings and results in a trustworthy manner.

Figure 5.28 illustrates the expanded and clarified set of considerations and elements of ADDIE Development after Cycle 3. One consideration is marked in grey, as it was not mentioned in Cycle 3 data. The four elements which were confirmed in Cycle 3 are marked in green, while one element which emerged in Cycle 3 is marked in orange.

Figure 5. 28
ADDIE Development (Cycles 1, 2 and 3)



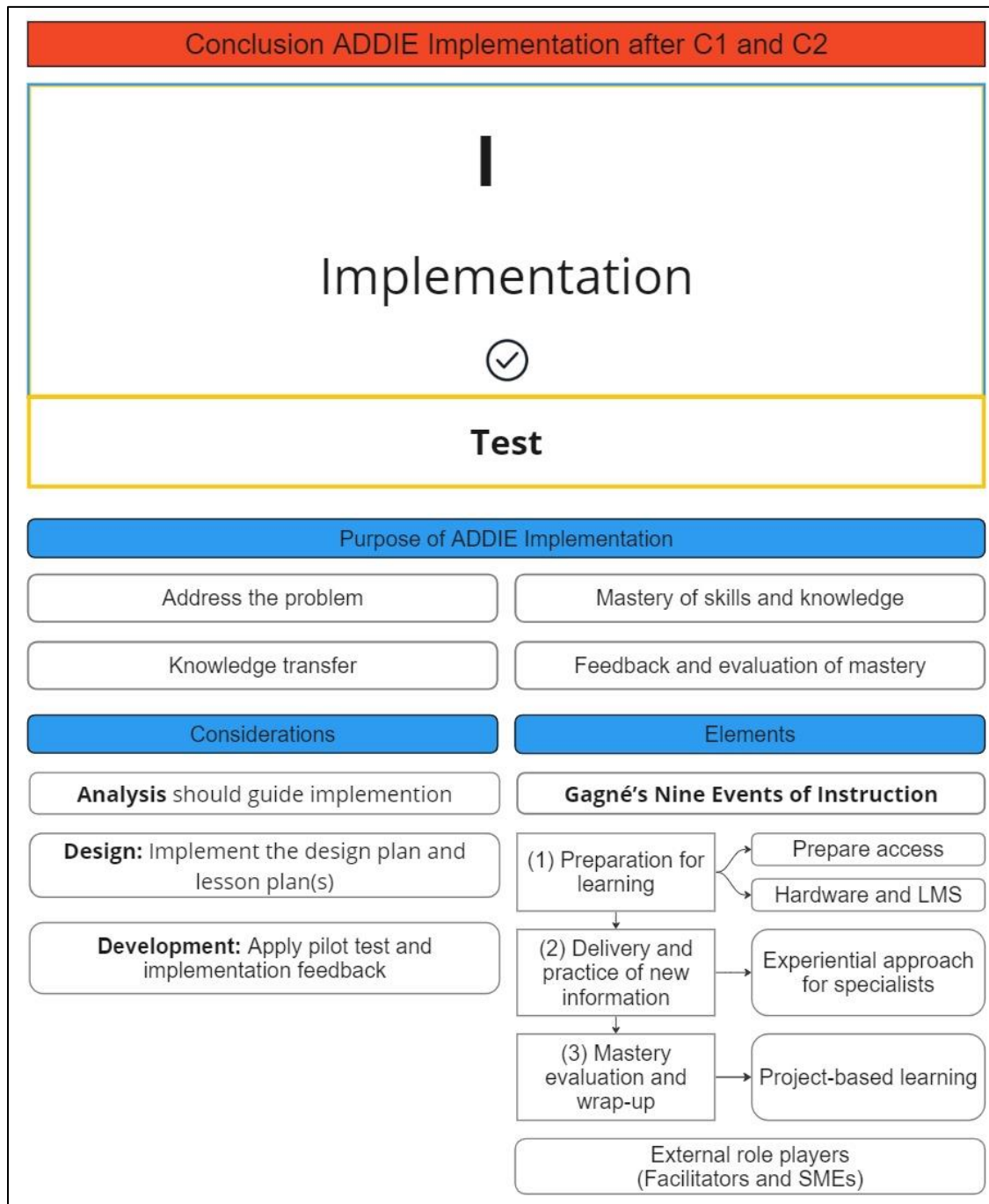
Source: The researcher

In the following section, the researcher analyses data gathered from participants in Cycle 3 about the ADDIE Implementation Phase.

5.6.1.5 Phase 4: Implementation

The Design Phase in the ADDIE Model of ID was discussed in Chapters 3 and 4 to induce confirmed current and emerging considerations and elements. Figure 5.29 illustrates the current considerations and elements of ADDIE Implementation after Cycle 1 and Cycle 2, as presented in 4.6.1.5 (C). Following Figure 5.29, the researcher presents the analysis and findings of the survey (Cycle 3) to induce a final revised set of elements and considerations.

Figure 5. 29
ADDIE Implementation (Cycle 1 and Cycle 2)



Source: The researcher

The researcher draws on the findings and results from Cycle 3 to clarify and expand the considerations and elements established in Cycle 1 and Cycle 2 for ADDIE Implementation. The researcher also analyses the responses from Cycle 3 for emerging themes which address research question 3 and subsequently the main research question.

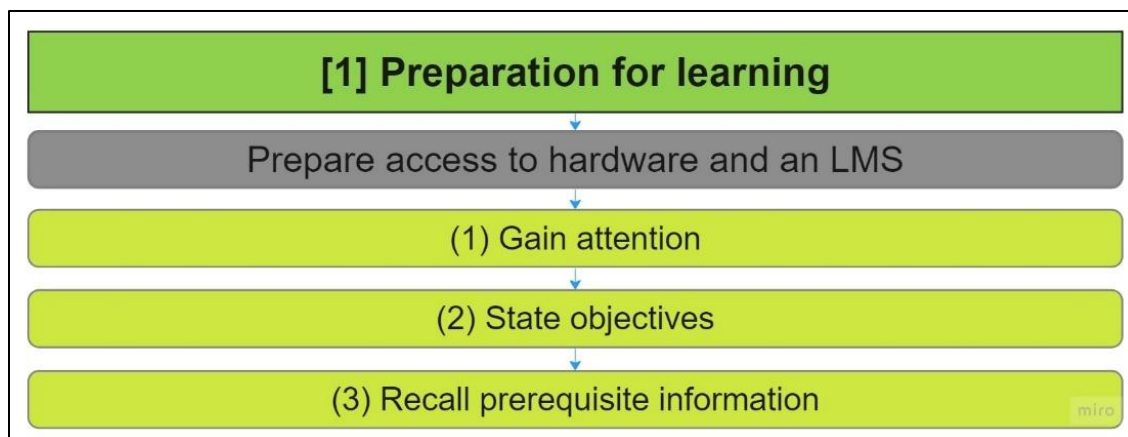
A) Expansion and clarification of ADDIE Implementation

The three phases of a lesson plan, namely, [1] preparation for learning; [2] delivery and practice of new information; and [3] mastery, evaluation, and wrap-up, were confirmed as elements of ADDIE Implementation in Cycle 3. ADDIE Implementation is the application of ADDIE Design. In this section, the researcher clarified and expanded on the expectation and approach which is preferred by educators when implementing the three phases of learning.

Implementation Event Group 1: Preparation for learning. In Cycle 1 and Cycle 2, the researcher found that preparation for learning required (1) gaining attention; (2) stating objectives; and (3) recalling prerequisite information. In Cycle 3, the respondents suggested that a facilitator can [1] gain the attention by asking probing questions (R2, R3, R4, R5, R6, R7); use of humour (R1, R7); setting a problem (R2) which draws on a relevant (R4) real life scenario (R3); or a video introduction (R5). The facilitator should [2] state the learning objectives so that participants understand the purpose of the course (R3); know what to expect (R4) and what is expected of them (R2, R7); and what they aim to learn from participation in the programme (R4). Lastly, [3] prerequisite knowledge can be established through an assessment (R2); questionnaire, group discussion or group activity (R3); quiz (R6); or questionnaire (R7).

Figure 5.30 illustrates the sub-elements of implementation phase 1: Preparation for learning.

Figure 5.30
Elements of Implementation Event Group 1: Preparation for learning



Source: The researcher

Three events were confirmed in Cycle 3 as sub-elements of [1] Preparation for learning. Preparation for access through hardware and access to the LMS did not emerge in Cycle 3. The researcher implemented the course on the LMS that the school uses to teach their students daily,

which meant very little preparation was required in Cycle 3, and time lost on preparation was minimised.

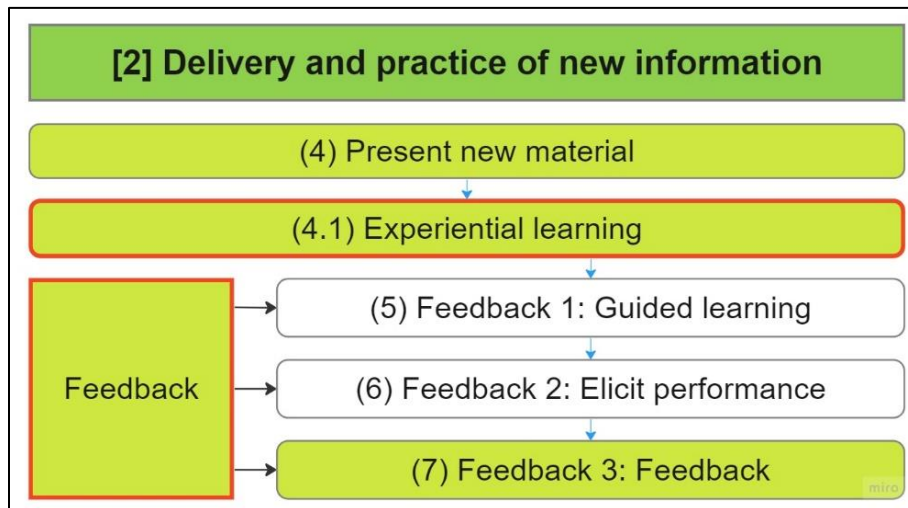
Implementation Event Group 2: Delivery and practice of new information. Delivery and practice of new information was established as essential to implementation, in the Cycle 3 analysis of the ADDIE Design phase. In Cycle 1 and Cycle 2, delivery and practice of new information consisted of four sub-elements, namely, (1) present new material; (3) feedback 1; (4) feedback 2; and (5) feedback 3. Application of an (4.1) experiential learning approach was discussed as an emerging theme in Cycle 2.

Respondents enjoyed (1) presentation of new material which was connected to a real-world context (R1, R4); well-structured (R2); self-paced (R4); uses various question types (R7), including discussions (R3) and use of videos (R5).

The course was implemented through an experiential learning approach, aimed at enabling self-paced and independent learning. Participants were required to take ownership of their learning, while provision was made for support and feedback through LMS-enabled discussion forums, online feedback and assessment rubrics, and a WhatsApp group. Experiential learning was confirmed as an effective and preferred course delivery method for educators (R1, R2, R3, R5, R7). An experiential learning delivery strategy, which is embedded in the context of the learning environment creates awareness (R3); addresses relevant problems (R1, R7); and is oriented toward implementation of solutions (R2) and development (R5).

Figure 5.31 illustrates the sub-elements of Implementation Phase 2: delivery and practice of new information after Cycle 3.

Figure 5. 31
Delivery and practice of new information, ADDIE Implementation



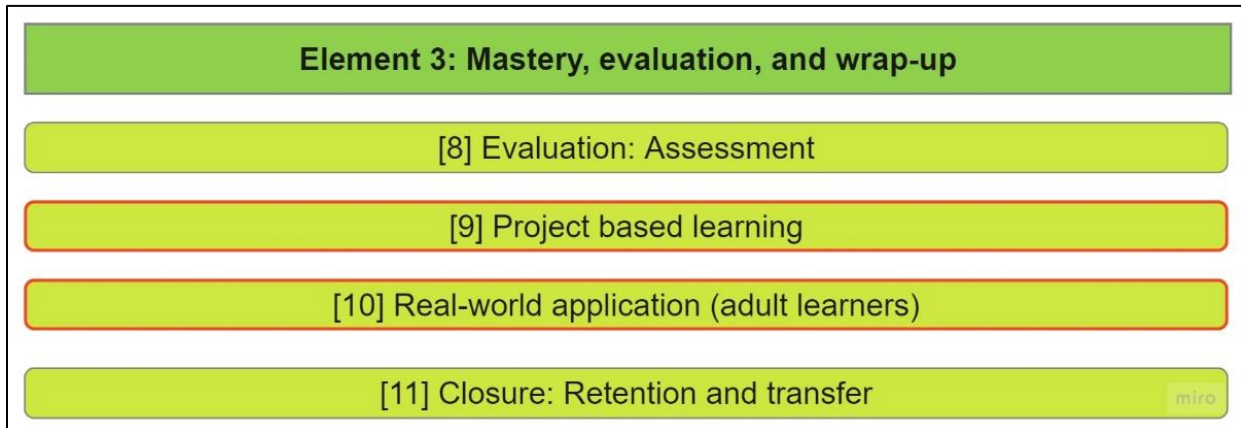
Source: The researcher

Feedback was confirmed as a key element to implementation. The researcher did not use Feedback 1–3 as set out in Cycle 1. The facilitator did not provide guided learning or elicit performance. When asked how feedback after each activity helped participants to complete the activities and course, respondents suggested that feedback motivates them (R4); makes it easier to stay up to date with course progression (R1); and affirms whether their understanding is correct and provides suggestions for changes in direction here needed (R4). Use of a daily-updated progress board motivated Respondent 4 to “be part of the achievement group” (R4).

Implementation Event Group 3: Mastery, evaluation, and wrap-up. Course implementation followed a project-based learning approach, with two informal assessments, two formal assessments and one final evaluation as compilation of individual contributions. Informal evaluation took place through questionnaires (R2). Discussions made learning easier (R6), provided different viewpoints for consideration (R3), and concepts were discussed in more depth in small groups (R5). Formal assessments were done through online forms (R2), followed by feedback session (R2). There was no need for retention. The purpose of the course was to present the findings to the school governing body for real-world application of solutions proposed.

Figure 5.32 illustrates the clarified and expanded results of implementation phase 3: Mastery, evaluation and, and wrap-up.

Figure 5. 32
Elements of Mastery, evaluation, and wrap-up, ADDIE Implementation



Source: The researcher

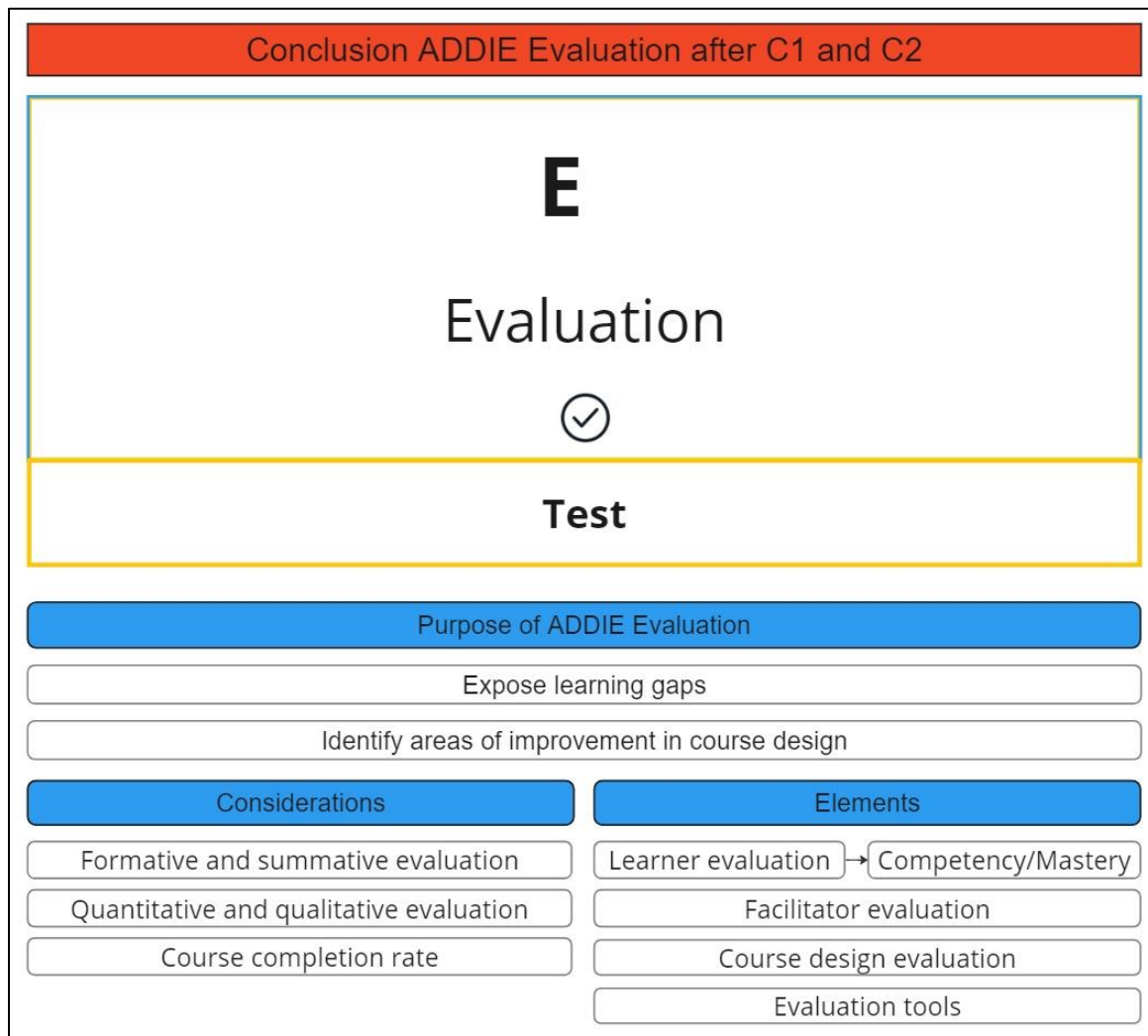
Four sub-elements of Element 3: Mastery, evaluation and wrap-up were confirmed. The most important elements of evaluation during implementation were perceived as project-based learning and real-world application (R1, R3–R7).

Findings and results of ADDIE Implementation are discussed in Chapter 6: Conclusion. In the following section, the researcher analyses data gathered from participants in Cycle 3 about the ADDIE Implementation Phase.

5.6.1.6 Phase 5: Evaluation

The Design Phase in the ADDIE Model of ID was discussed in Chapters 3 and 4 to induce confirmed current and emerging considerations and elements. Figure 5.34 illustrates the current considerations and elements of ADDIE Evaluation after Cycle 1 and Cycle 2, as presented in 4.6.1.6 (C). Following Figure 5.33, the researcher presents the analysis and findings of the survey (Cycle 3) to induce a final revised set of elements and considerations.

Figure 5. 33
ADDIE Evaluation (Cycle 1 and Cycle 2)



Source: The researcher

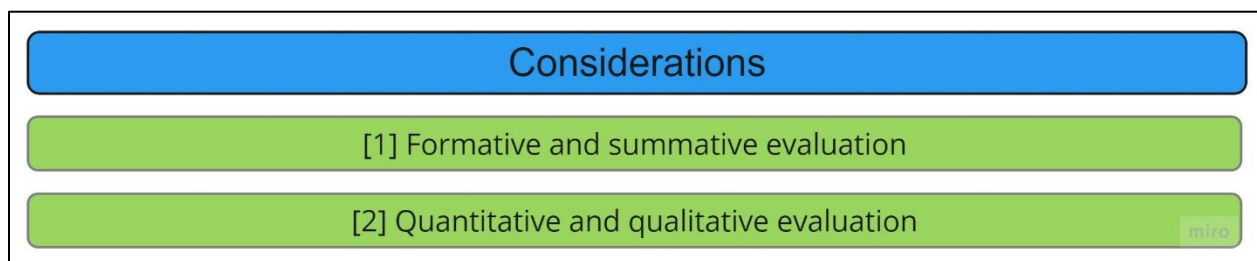
The researcher draws on the findings and results from Cycle 3 to clarify and expand the considerations and elements established in Cycle 1 and Cycle 2 for ADDIE Evaluation. The researcher also analyses the responses from Cycle 3 for emerging themes which address research question 3 and subsequently the main research question.

A) Expansion and clarification of ADDIE Evaluation

The purpose of evaluation in this course was to [1] expose operational gaps as key areas of development, rather than individual learning gaps. Assessment was instrumental to obtaining participant feedback and identify areas of improvement in the school. Although very little feedback was obtained about evaluation of course design, Respondent 7 indicated a course should be followed by a ranking or evaluation of the session.

Figure 5.34 illustrates the considerations of ADDIE Evaluation after Cycle 3.

Figure 5. 34
Considerations of ADDIE Evaluation (Cycle 3)

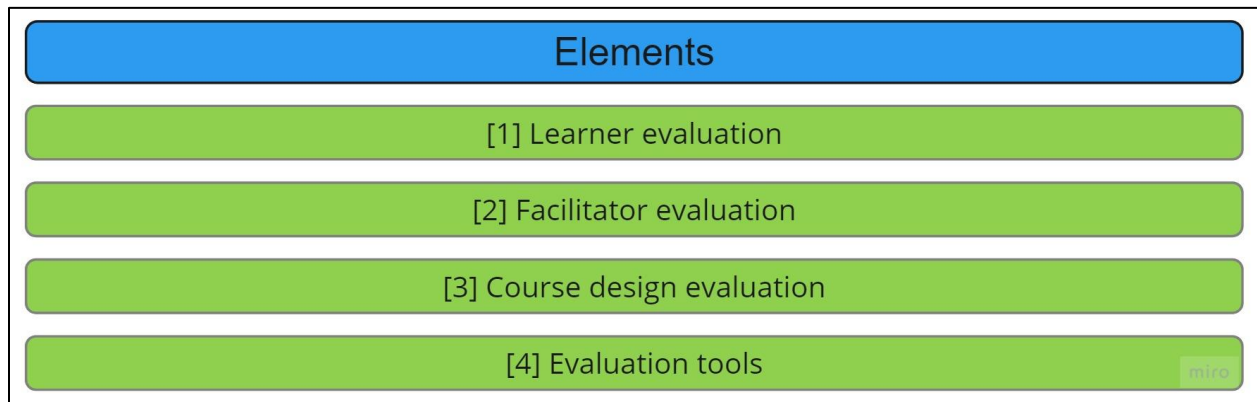


Source: The researcher

Both considerations of ADDIE Evaluation were confirmed in Cycle 3. The researcher incorporated [1] formative and summative evaluation. Participants responded very well to formative evaluation [R2, R3, R4, R5, R6]. Formative evaluation, and the feedback received on submissions “affirms if you understood the subject matter correctly or if you need to move in a different direction” (R4) which motivated participants to complete tasks and do well in the assessments (R4). [2] Qualitative and quantitative evaluation was implemented in the course. Questionnaires, online forms, and feedback sessions (R2) and discussions (R7) helped to complete the activities and final evaluation.

Figure 5.35 illustrates the conclusion to the elements of ADDIE Evaluation after Cycle 3.

Figure 5. 35
Elements of ADDIE Evaluation (Cycle 3)



Source: The researcher

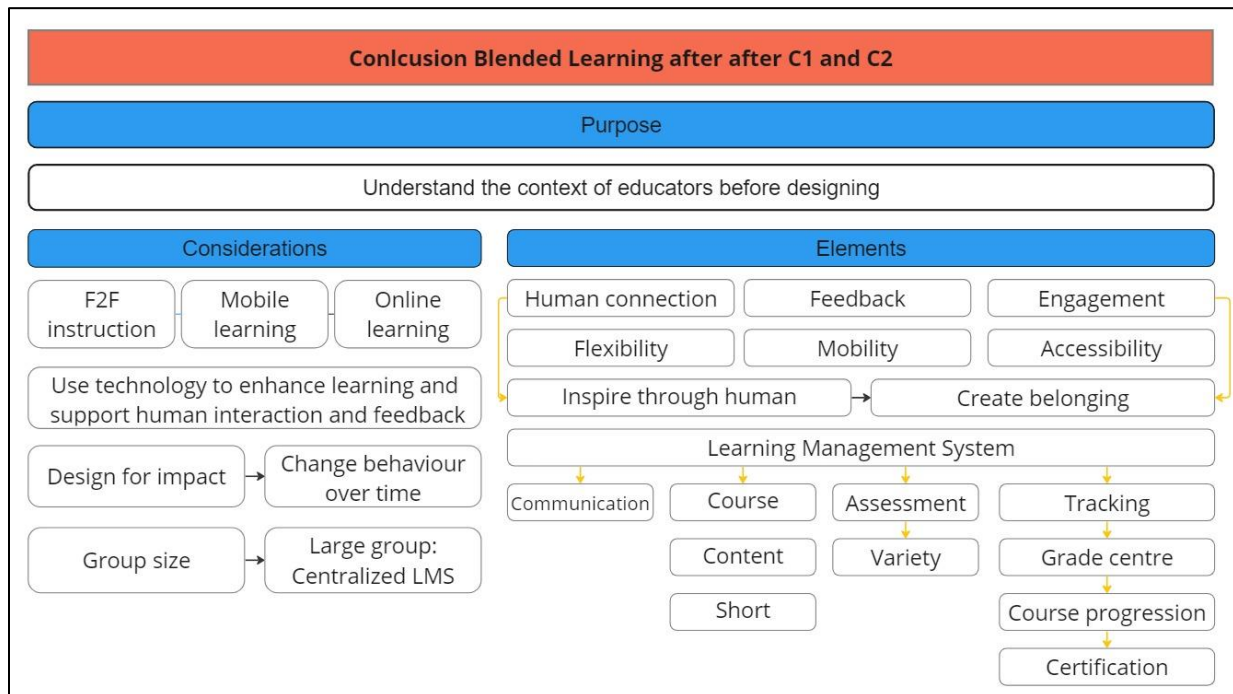
Four elements of ADDIE Evaluation were confirmed in Cycle 3. [1] Learner evaluation took place through the course in the form of questionnaires, online forms, feedback sessions (R2), videos (R6) and various assessment types (R7). [2] Facilitator evaluation was limited in this course since course implementation was done through self-directed learning and experiential learning approaches. Participants did however affirm facilitator-led discussions (R3, R6, R7) and facilitator feedback (R2, R3, R4) as key elements to course implementation during the [3] course evaluation. Multiple [4] evaluation tools were implemented in the evaluation phase, including questionnaires, online forms, feedback sessions (R2), discussions (R7). Teachers expressed concern that no (R1, R2, R3, R4, R6), or very limited (R3, R5, R7) evaluation is currently done after F2F CPD programmes at the school.

In the following section, the researcher clarifies and expands the purpose, considerations, and elements of research focus area 2: Blended learning, based on the findings in Cycle 3.

5.6.2 Blended learning

Blended learning was discussed in Chapters 3 and 4 to establish considerations and elements of blended learning when designing a blended CPD short course for educators. These considerations and elements are presented in Figure 5.36.

Figure 5.36
Blended learning (Cycle 1 and Cycle 2)



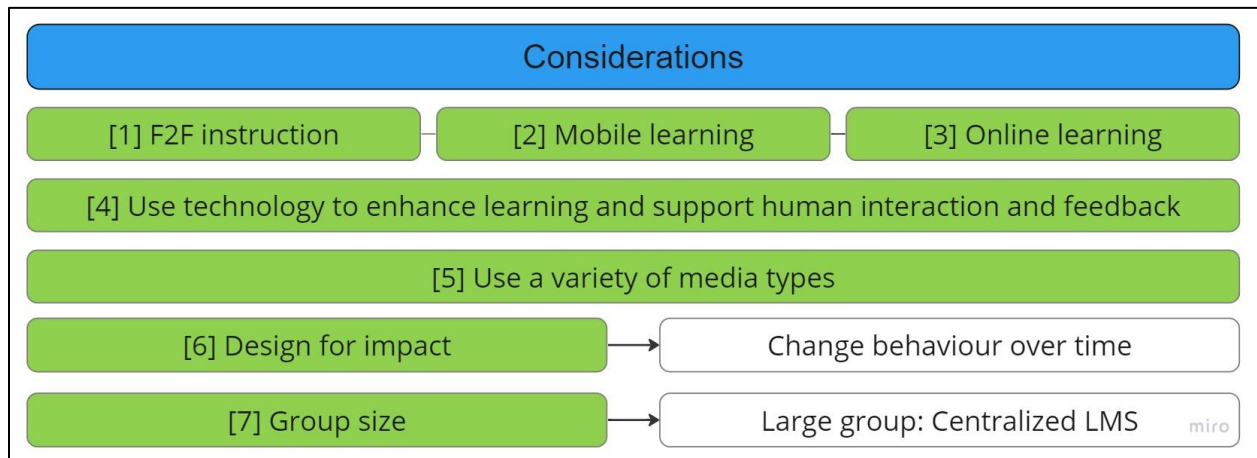
Source: The researcher

5.6.8.1 Expansion and clarification of blended learning

The purpose of blended learning is to overcome time constraints (R3) and increase accessibility (R2), mobility and flexibility (R5) for course participation.

Figure 3.37 illustrates the considerations of blended learning based on the findings of Cycle 3.

Figure 5. 37
Considerations of blended learning (Cycles 1, 2 and 3)

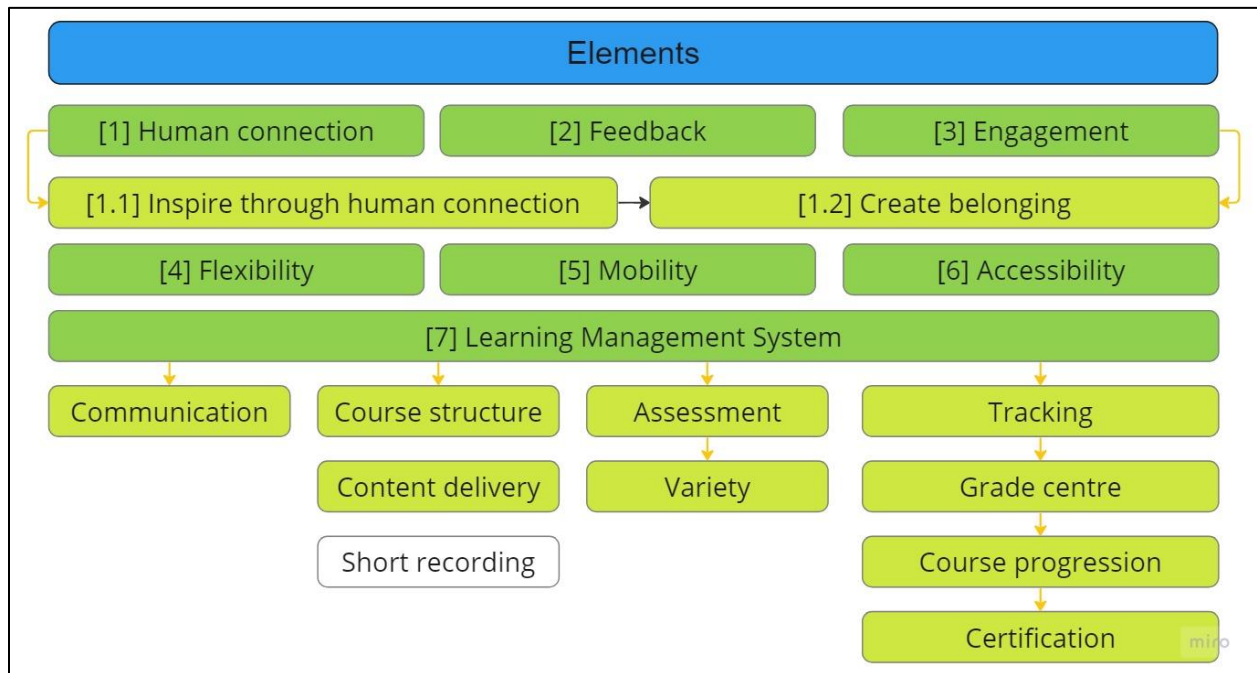


Source: The researcher

Seven considerations of blended learning, established in Cycle 1 and Cycle 2, were confirmed in Cycle 3. The researcher implemented a combination of [1] F2F instruction; [2] mobile learning and [3] online learning. [4] Technology was used to enhance learning and support human interaction and feedback. Technology integration helped us to learn quicker and easier (R7). Use of a [5] variety of media types, including text, audio, video, images helped visual learners (R1). The course was [6] designed for impact. The course was described as “structured, short and sweet and not information overload” (R2). Behavioural change was not measured over time due to time constraints. [7] Group size was limited to 10 participants, who engaged with and completed the course through a combination of the Google Classroom LMS and the WhatsApp social media application. The course completion rate was 70%, which was in line with the expected completion rate mentioned in Cycle 2.

Figure 5.38 illustrates the elements of blended learning, as implemented in Cycle 3.

Figure 5.38
Elements of blended learning (Cycles 1, 2 and 3)



Source: The researcher

Seven elements of blended learning were confirmed in Cycle 3. Firstly [1] human connection through [3] feedback and [2] engagement plays a critical role in the success of a course. Human connection [1.2] inspires involvement and focus (R1); clarifies expectations (R2); encourages engagement (R2, R5); peer collaboration (R2, R3) and a sense of safety and [1.2] belonging (R6). “Teachers are able to teach each other” (R2). Technology integration enables [4] flexibility; [5] mobility and [6] accessibility. Participants were able to complete the course at their own time and own pace (R3). Technology enables course implementation with a lot of people “all over the country” (R7). The LMS was used for communication; to establish a course structure; deliver content; perform assessment; vary assessment types; track participation; grade assessments and provide feedback; and measure course progress for individual participants. Certification and badges were incorporated through an external software application (Canva) and had a very positive effect on participant engagement and course completion. Recordings were not done since there were no synchronous classes in this course.

5.7 Test

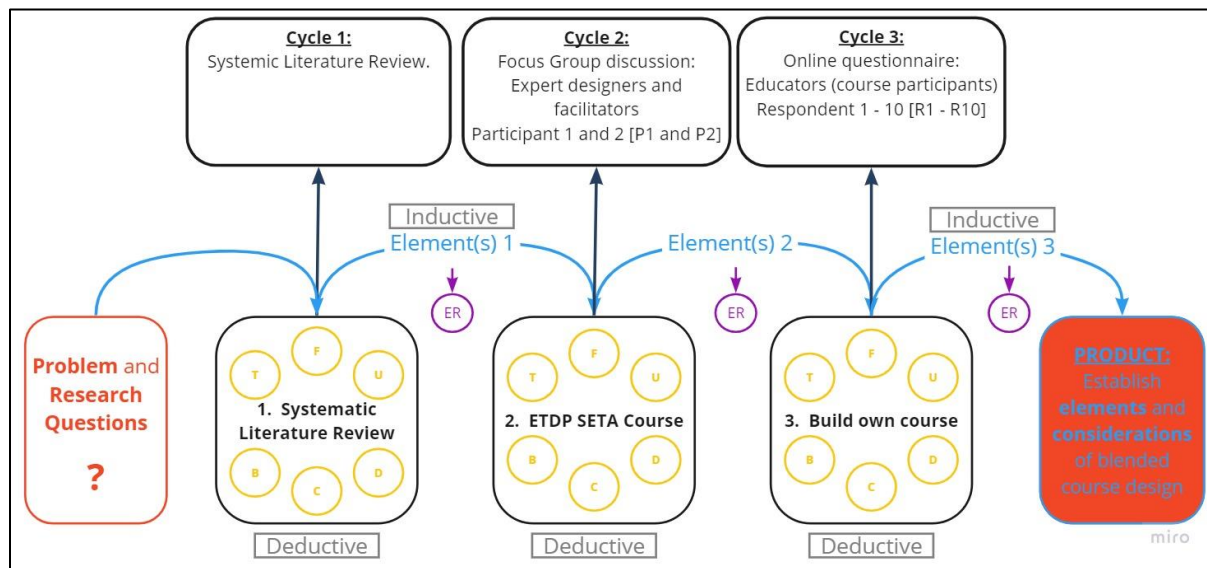
The findings and results from Cycle 3 are presented as in Chapter 6: Conclusion. Each element and consideration is presented as a finding of this study, which will be tested by the researcher and other academic writers in future studies.

Chapter 6: Conclusion

6.1 Introduction

Chapter 6 presents the final set of **elements and considerations of blended continuous professional development short course design for educators** as induced through research Cycles 1–3. The cumulative findings and results present the final set of design elements and considerations of blended course design. Figure 6.1 illustrates the positioning of Chapter 6 in the study.

Figure 6. 1
Positioning of Chapter 6 in the study



Source: The researcher

Chapter 6 serves as the 'product' of the study and presents the elements and considerations of blended course design for educators by combining the elements and considerations induced in Cycles 1–3.

Firstly, the conclusion to elements and considerations (6.2) are presented, followed by the limitations (6.3), contributions (6.4), recommendations for further studies (6.5) and final remarks on the study.

6.2 Main research question

The researcher addressed three sub-research questions in this study. The first sub-research question was addressed in Chapter 3, SLR; the second sub-research question by Chapter 4, Elements of an existing course and the third sub-research question by Chapter 5, Elements from a newly designed course. The findings from each chapter were compiled to address the main research question.

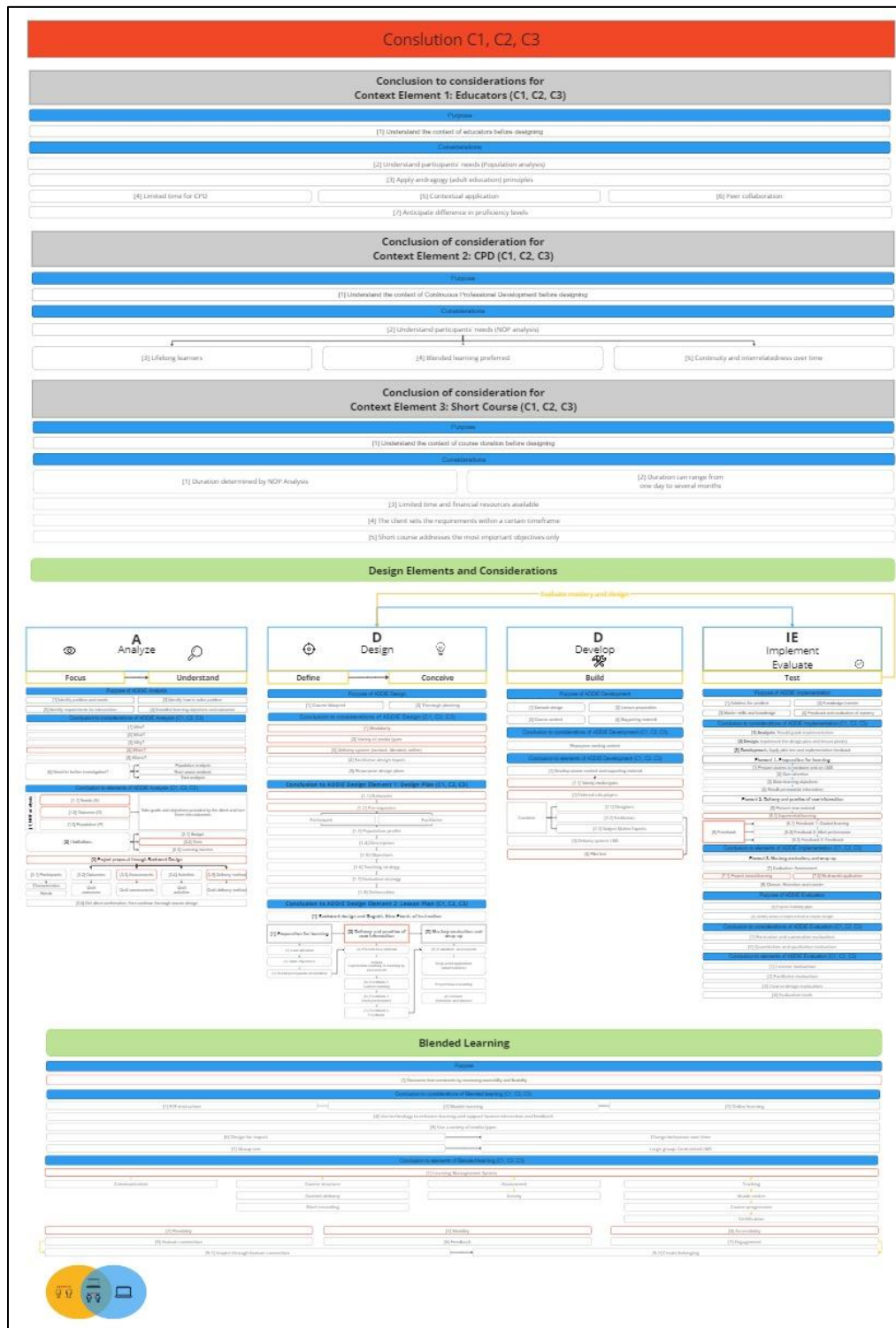
Main research question:

What elements should be included during blended CPD short course design for educators?

In this chapter, the researcher presents the final set of elements and considerations of the three contextual elements of the study, namely, (1) educators; (2) CPD programmes; and (3) short course, as well as two key research focus areas, namely, (1) design elements and (2) blended learning. The findings and results are compiled using Chapter 3 (SLR); Chapter 4 (existing course); and Chapter 5 (newly designed course).

Figure 6.2 presents a zoomed-out overview of the elements and considerations of the three context elements (6.2.1–6.2.3); the design elements (6.2.4–6.2.9) and blended learning (6.2.10) as presented in Chapter 6. The researcher acknowledges that the text is too small to read on the figure. The figure is however included to display enlarged view of the findings of the study, before discussing the research contexts and research focus areas. A conclusion is presented on each individual context, design element and blended learning in Chapter 6. Each section presents a purpose, considerations, and elements. Numbers are used to connect the text for each section's conclusion to the relevant figure.

Figure 6. 2
Conclusion of elements and considerations Cycles 1, 2 and 3 combined.



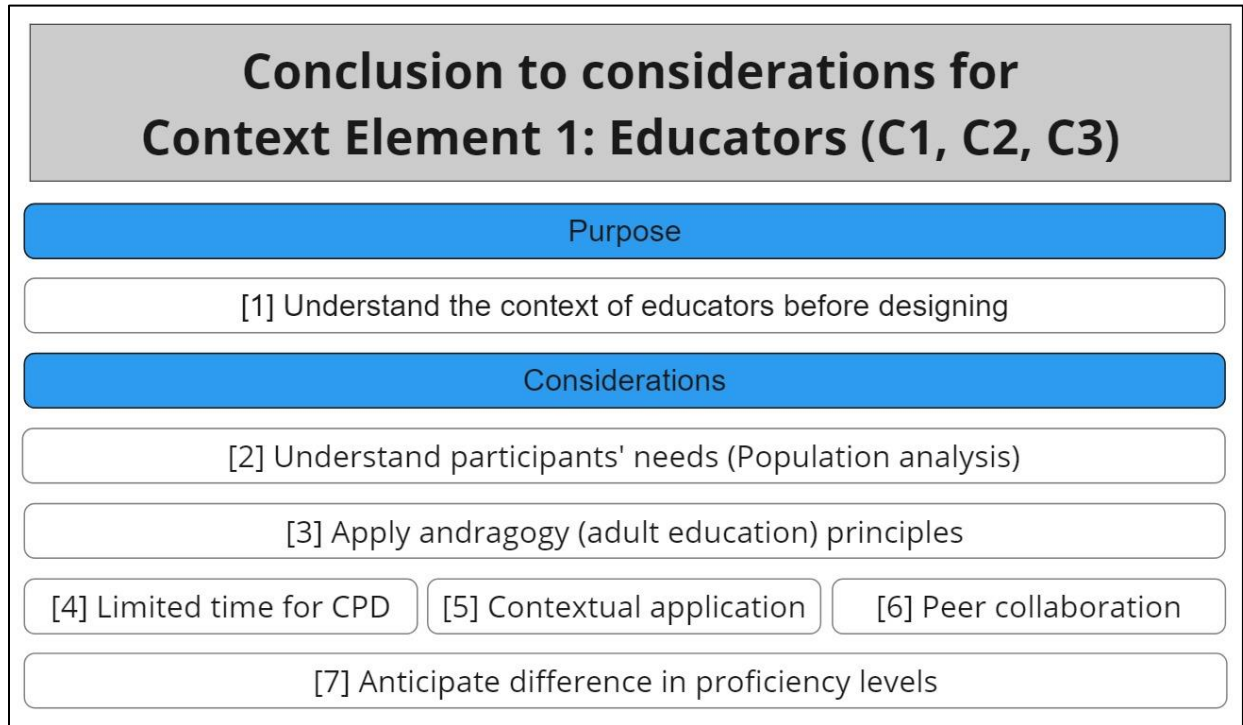
Source: The researcher

The conclusion to the findings and results of the considerations and elements of Context Element 1: Educators follows.

6.2.1 Context Element 1: Educators

Figure 6.3 illustrates the combined (Cycles 1, 2 and 3) conclusion for Context Element 1: Educators for the study.

Figure 6.3
Considerations for Context Element 1 (Cycles 1, 2 and 3)



Source: The researcher

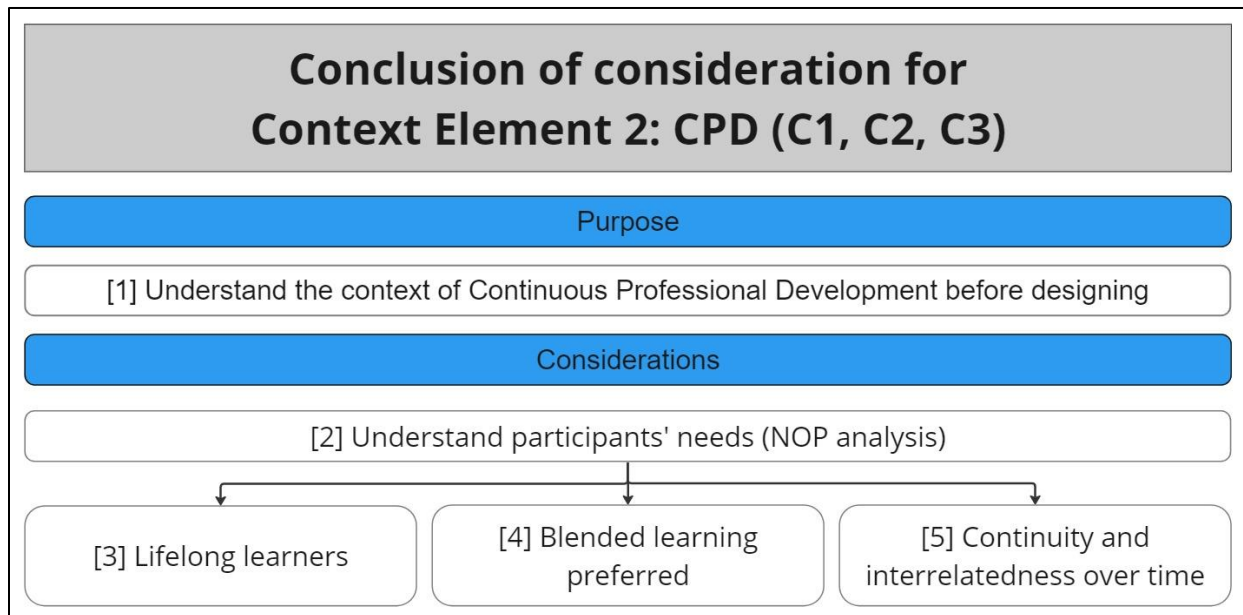
The researcher concludes that learning programmes intended for the context of educators should [1] have a clear understanding of the context of the educators before designing and implementing a course. Thorough [2] population analysis should precede course design and implementation. When implementing a course, the designer should keep in mind that the participants are [3] adult learners. Courses designed for adult learners should consider the [4] limited time adults have available to participate in CPD programmes. [5] Adults prefer a course which applies to their personal and professional contexts; prefer to [6] collaborate as a means of learning; and lastly [7] proficiency levels among participants will differ. The facilitator should be aware that each participant brings a set of skills, knowledge, and experience to the course. Participants should be allowed to collaborate, share their experience, and learn from each other to accelerate learning and enable mentorship and transferring of skills and knowledge between participants.

The conclusion to the findings and results of the considerations and elements of Context Element 2: CPD follows.

6.2.2 Context Element 2: Continuous Professional Development

Figure 6.4 illustrates the combined (Cycles 1, 2 and 3) conclusion for Context Element 2: CPD.

Figure 6.4
Considerations for Context Element 2 (Cycles 1, 2 and 3)



Source: The researcher

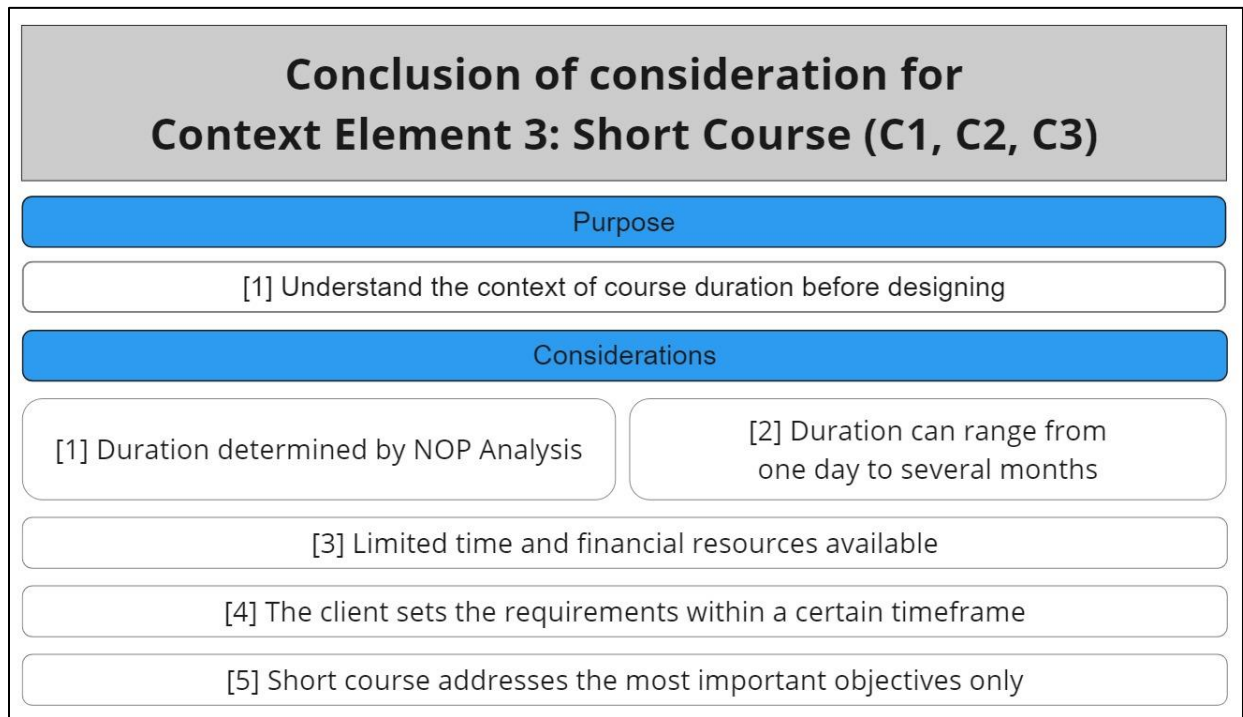
The researcher concludes that learning programmes intended for the purpose of CPD of educators should [1] understand the context of the participants and learning environment. The designer should [2] understand participants' needs by doing thorough NOP Analysis (discussed in ADDIE Analysis). Educators desire to continue their learning through their professional career as [3] lifelong learners but do so under severe time constraints. To overcome the time constraints designers should implement a [4] blended learning approach to allow flexibility and accessibility. F2F instruction should be used to inspire participants and draw out meaningful engagement. [5] CPD programmes should spread interlinked learning modules over an extended period so that participants can gradually digest and internalise the learning.

The conclusion to the findings and results of the considerations and elements of Context Element 3: Short course follows.

6.2.3 Context Element 3: Short course

Figure 6.5 illustrates the combined (Cycles 1, 2 and 3) conclusion for Context Element 3: Short course for the study.

Figure 6.5
Considerations for Context Element 3 (Cycles 1, 2 and 3)



Source: The researcher

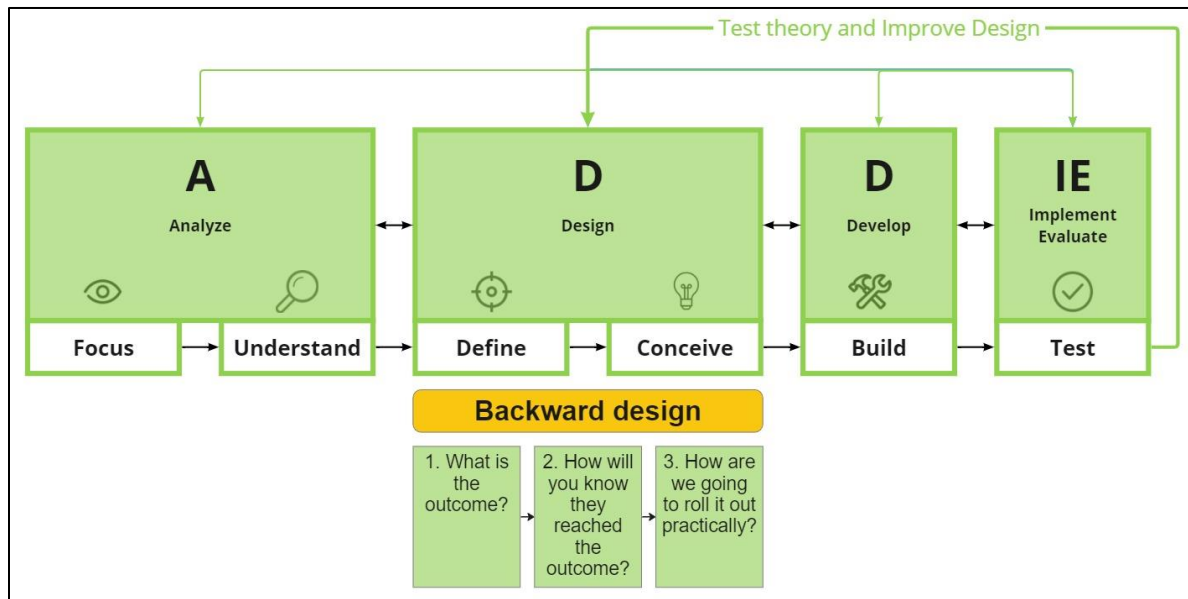
The researcher concludes that a short course should be designed for the [1] context of the participants and learning environment. [2] Course duration is determined by time constraints, established during the ADDIE Analysis phase. The course duration can vary from a few hours to a few months. The main limitation when determining the short course duration is [3] time and financial resources (budget). Due to the demands of their work, educators have limited time available for CPD, while budget restrictions will vary from client to client. The [4] client can state which objectives must be met, as well as the timeframe available for implementation, or the designer can set the timeframe based on the outcomes that need to be met. A short course should allocate sufficient time and flexibility for educators to complete all activities and address the [5] learning objectives which are instrumental to satisfy the needs of the course participants.

The conclusion to use of the ADDIE ID Model follows.

6.2.4 Instructional Design Models

Figure 6.6 illustrates the combined (Cycles 1, 2 and 3) conclusion for the ID model.

Figure 6.6
Conclusion to ID Model (Cycles 1, 2 and 3)



Source: The researcher

The researcher concludes that a blended short course, intended for the purpose of CPD of educators, should use an ID model to design and implement a course. Although ID models were not presented in the form of considerations and elements, the researcher finds that a well-developed ID model can be elemental to course design. The use of backward design can serve as the backbone of course design. Backward design should address three core areas: (1) what the outcomes are to be addressed; (2) how the designer will know if the outcomes were successfully addressed; and lastly (3) how the course will be rolled out practically.

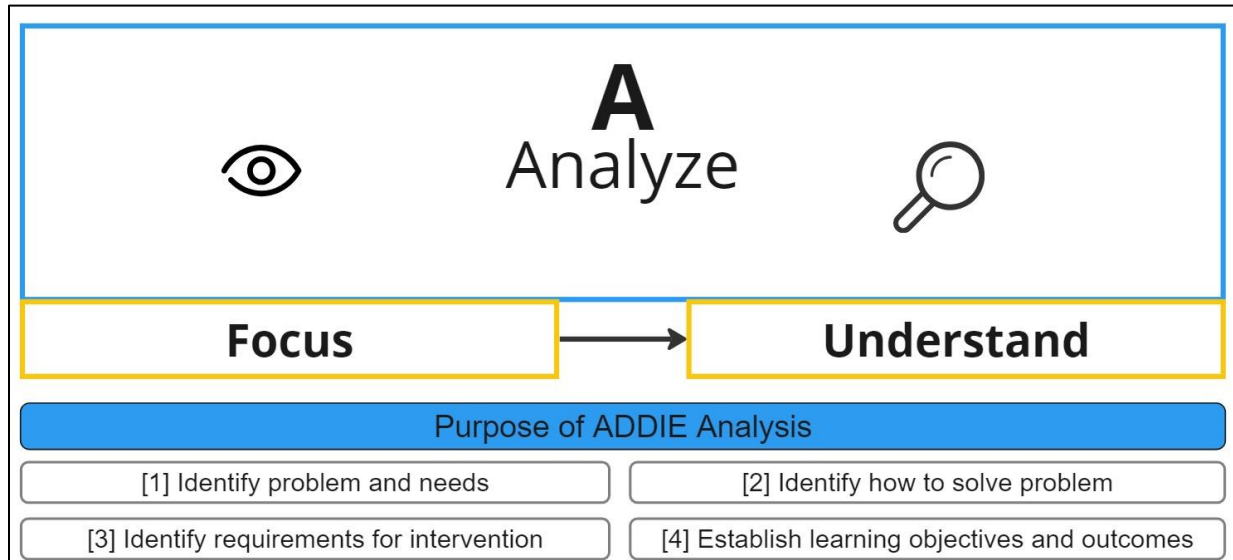
The researcher finds that the ADDIE Model of ID is a suitable one to guide thorough course design. Although the researcher chose ADDIE for this study, any other well-developed ID models can be used for design or research purposes. The general structure presented by the ADDIE Model, including Analysis, Design, Development, Implementation and Evaluation, is, however, elemental to design of short blended CPD programmes for educators.

The conclusion, findings and results of the purpose, considerations and elements of the ADDIE Analysis phase follows.

6.2.5 ADDIE Analysis

Figure 6.7 illustrates the researcher's conclusion to the purpose of ADDIE Analysis after Cycle 1, Cycle 2 and Cycle 3.

Figure 6. 7
Purpose of ADDIE Analysis (Cycles 1, 2 and 3)

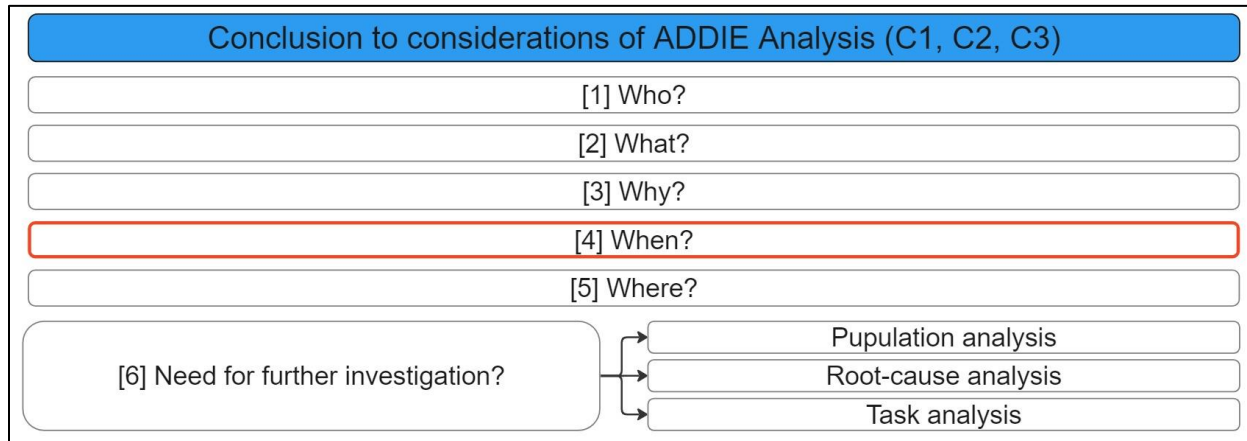


Source: The researcher

Based on the findings and results of Cycles 1, 2 and 3, the researcher concludes that ADDIE Analysis plays a critical role in blended CPD short course design for educators. ADDIE Analysis is intended to help the designer focus on and understand the design context and needs. ADDIE Analysis is used to [1] identify a problem and need; [2] identify how to solve the problem; [3] identify requirements for intervention; and [4] establish learning objectives and outcomes.

Figure 6.8 illustrates the conclusion to the considerations of ADDIE Analysis after Cycles 1, 2 and 3.

Figure 6.8
Considerations of ADDIE Analysis (Cycles 1, 2 and 3)

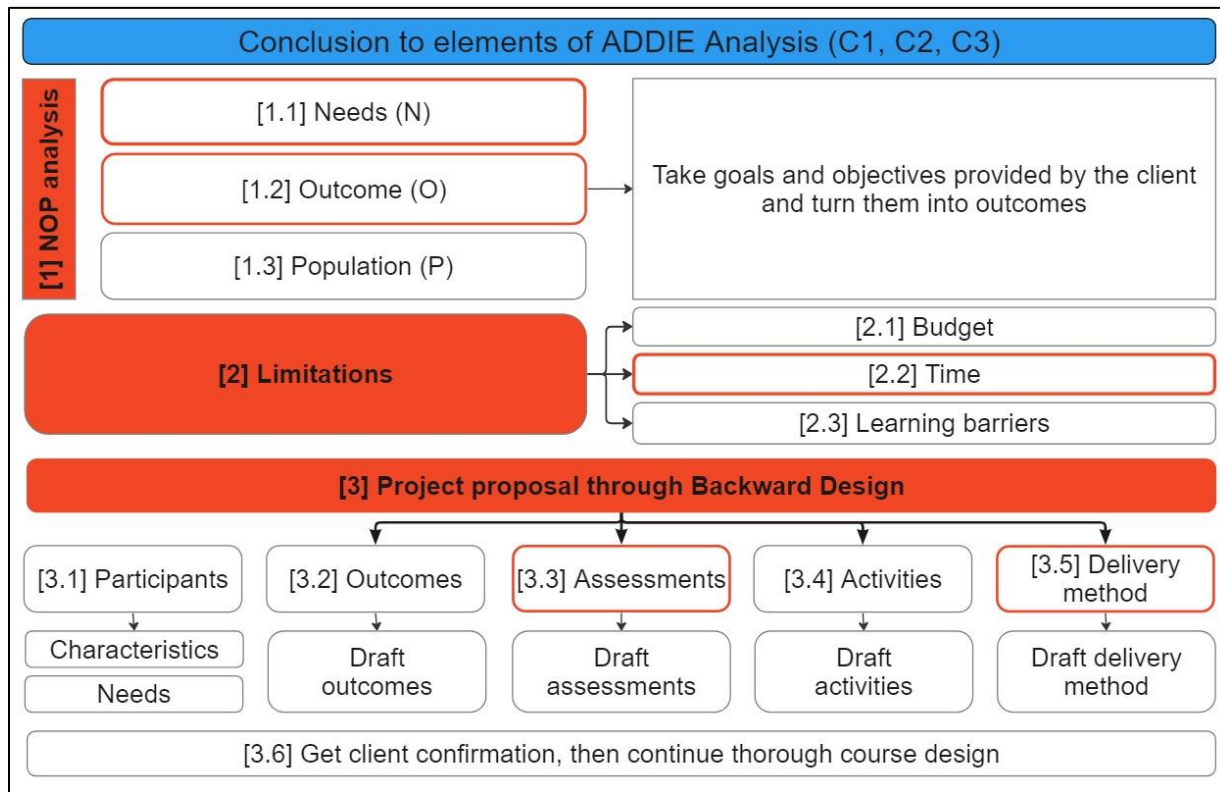


Source: The researcher

There are five considerations to the ADDIE Analysis phase, namely [1] who; [2] what; [3] why; [4] when; and [5] where. Timing of course implementation (when) emerged as a key consideration of ADDIE Analysis. At times, it might be beneficial for the designer to [6] investigate further to establish the requirements to solve the identified problem. Further investigation can take place through further population analysis, root-cause analysis, and task analysis, discussed in Cycle 1.

Figure 6.9 illustrates the researcher’s conclusion on the elements of ADDIE Analysis, based on the findings and results of Cycles 1, 2 and 3.

Figure 6.9
Elements of ADDIE Analysis (Cycles 1, 2 and 3)



Source: The researcher

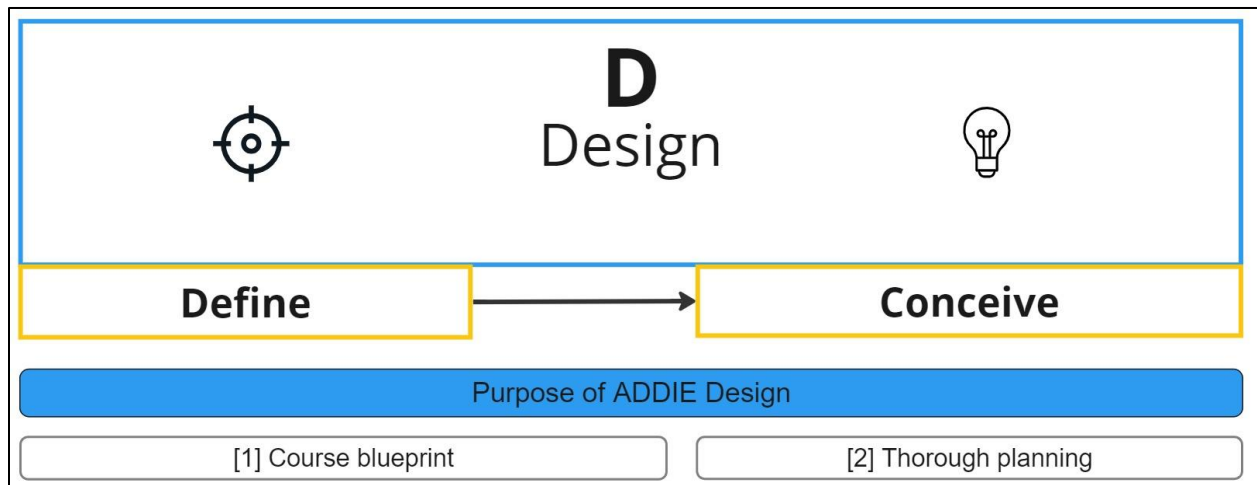
The researcher concludes that there are three main elements to ADDIE Analysis, namely, [1] a NOP Analysis; [2] establishment of limitations; and [3] a project proposal. An [1] NOP Analysis is performed to analyse and understand the [1.1] Needs (N); [1.2] Outcomes (O) and [1.3] Population (P) for whom the course is intended. Though the client might request that certain objectives are met, the designer is responsible for turning objectives into outcomes. Every course has predetermined [2] limitations, which the designer must establish and understand before design commences. Design limitations include [2.1] budget; [2.2] time and [2.3] learning barriers. Lastly, a [3] project proposal should precede course design. The researcher finds that backward design is a simple and reliable approach, which can be used as the backbone of the project proposal. Sub-elements to be included in the project proposal include the [3.1] course participants, including their characteristics and needs; [3.2] draft course outcomes; [3.3] draft assessments; [3.4] draft activities; and lastly the [3.5] suggested delivery method. Designers are advised to always obtain client confirmation before design commences.

The conclusion to the findings and results of on the purpose, considerations and elements of the ADDIE Design phase follows.

6.2.6 ADDIE Design

Figure 6.10 illustrates the conclusion to the purpose of ADDIE Design after Cycles 1, 2 and 3.

Figure 6. 10
Purpose of ADDIE Design (Cycles 1, 2 and 3)

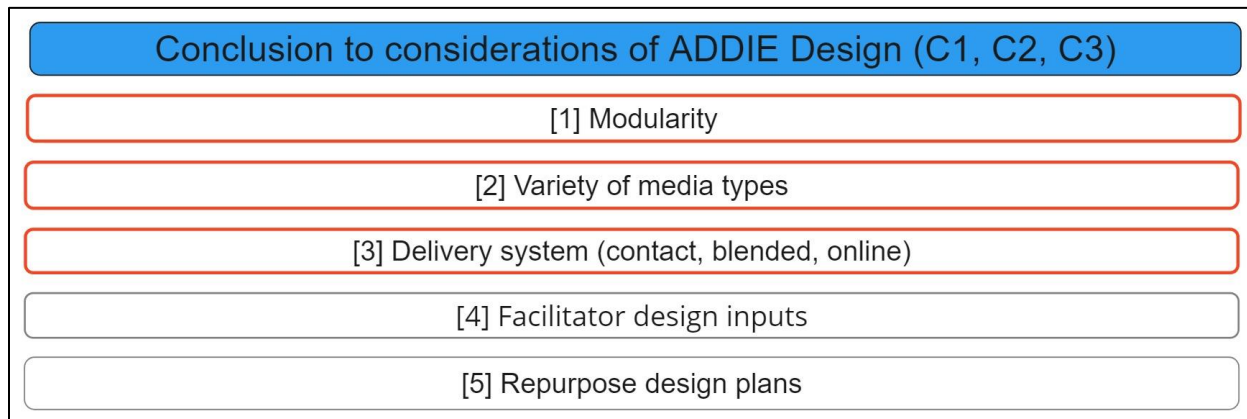


Source: The researcher

Based on the findings and results of Cycles 1, 2 and 3, the researcher concludes that ADDIE Design plays a critical role in blended CPD short course design for educators. The purpose of ADDIE Design is to [1] design a course blueprint and [2] do thorough planning for course development and implementation.

Figure 6.11 illustrates the conclusion to the considerations of ADDIE Design after Cycles 1, 2 and 3.

Figure 6. 11
Considerations of ADDIE Design (Cycles 1, 2 and 3)

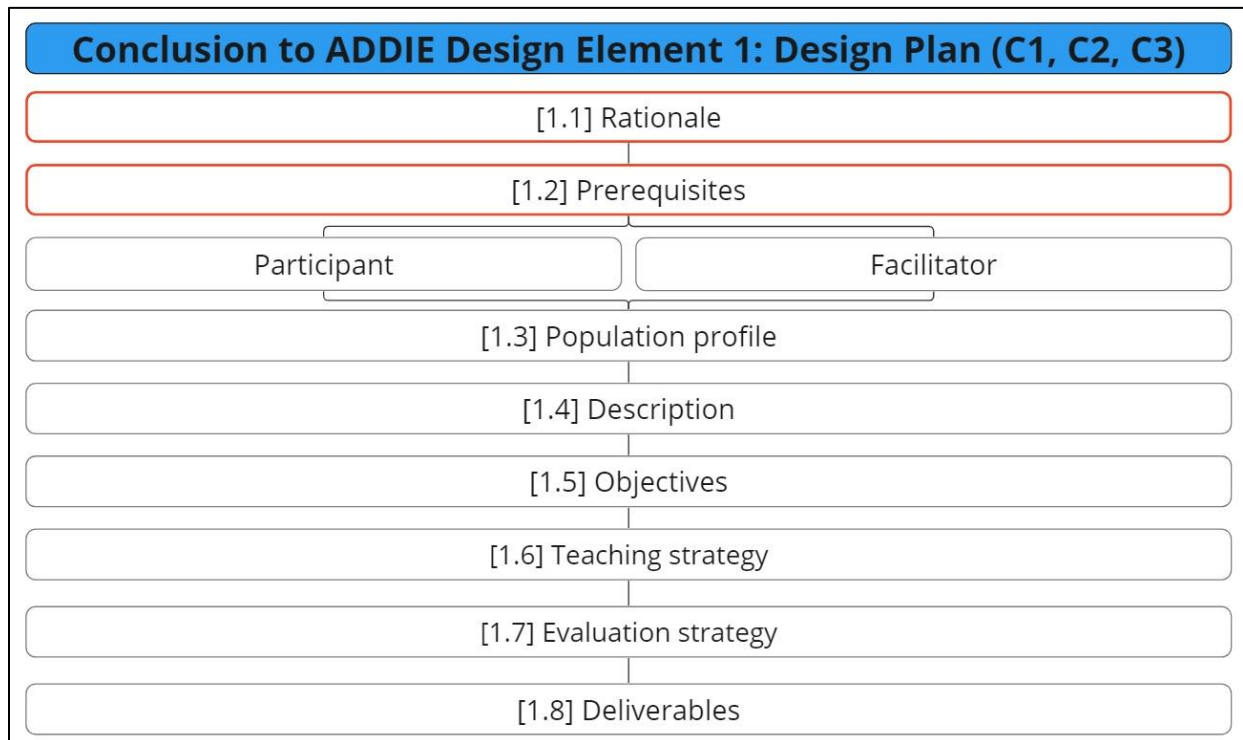


Source: The researcher

The researcher concludes that there are five considerations to ADDIE Development, namely, [1] apply modularity to course content; [2] design for development and use of a variety of media types; [3] decide on and design the delivery system for development and implementation; [4] draw on facilitators for design inputs; and lastly [5] repurpose design plans from previous courses to save time on course design. [1] Modularity; [2] varying media types; and [3] the delivery system emerged as key elements of ADDIE design.

Figure 6.12 illustrates the conclusion to the elements of a Design Plan, based on the findings and results of Cycles 1, 2 and 3.

Figure 6. 12
Elements of the ADDIE Design Plan (Cycles 1, 2 and 3)

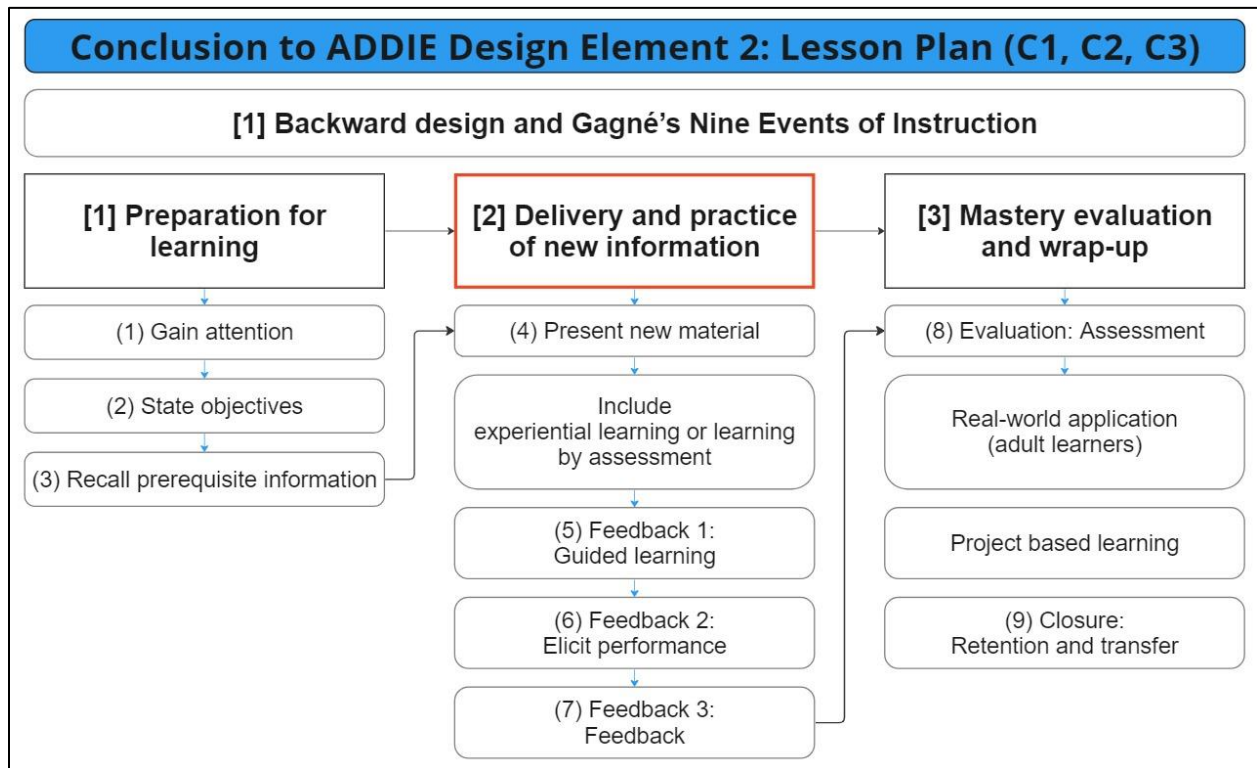


Source: The researcher

The researcher concludes that there are two primary elements to the ADDIE Design Phase, namely, a [1] Design Plan and [2] Lesson Plan. A [1.1] rationale and [1.2] prerequisites for participants and facilitators were established as the two most important sub-elements of the design plan. Other sub-elements of a design plan include a [1.3] population profile; [1.4] course description; [1.5] course and learning objectives; [1.6] teaching strategy; [1.7] evaluation strategy; and lastly [1.8] course deliverables. [1.1] Rationale, knowing why participation is important and [1.2] prerequisites, knowing what is required to partake in the course, emerged as key elements.

Figure 6.13 illustrates the conclusion to the elements of a Design Plan, based on the findings and results of Cycles 1, 2 and 3.

Figure 6. 13
Elements of a Design Plan (Cycles 1, 2 and 3)



Source: The researcher

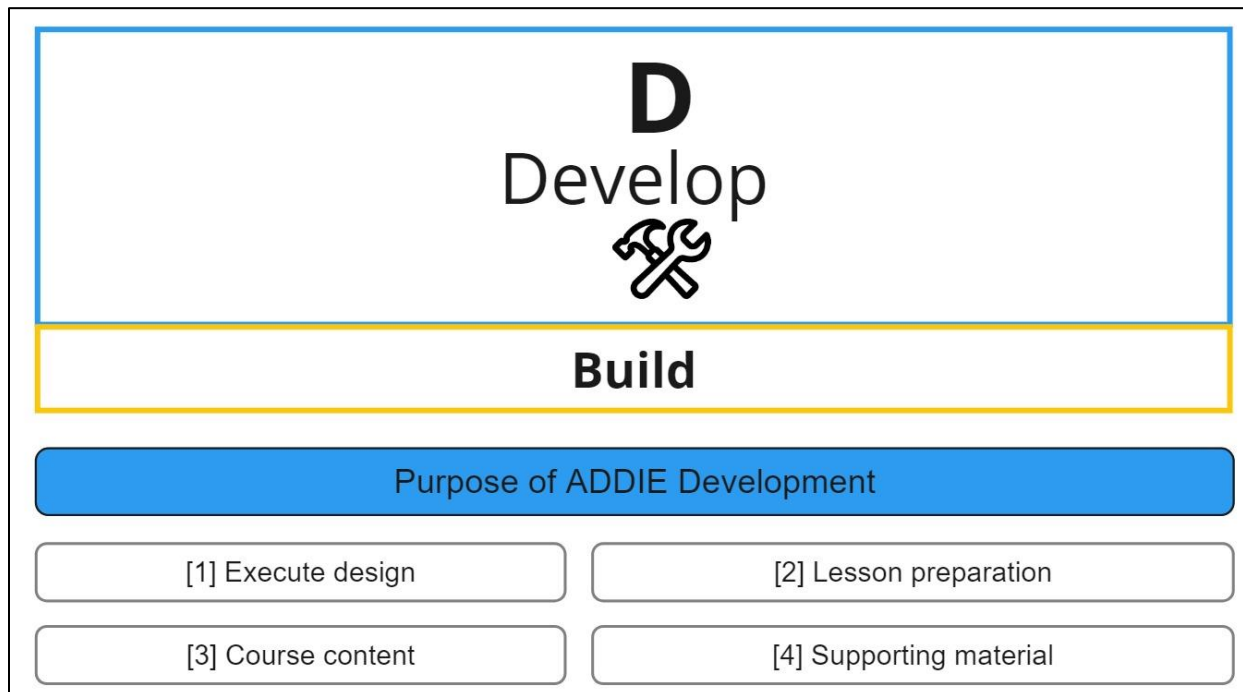
The second element of ADDIE Design is a lesson plan. Designers should use the [1] backward design model as the backbone of the lesson plan design and design the implementation plan. Gagné's Nine Events of Instruction serves as a reliable framework for each lesson plan. Each lesson plan should follow three phases, namely, [1] Preparation for learning; [2] Delivery and practice of new information; and lastly [3] Mastery, evaluation, and wrap-up. A discussion on the Nine Phases of Instruction follows in the ADDIE Implementation phase.

The conclusion to the findings and results of the purpose, considerations and elements of the ADDIE Development phase follows.

6.2.7 ADDIE Development

Based on the findings and results of Cycles 1, 2 and 3, the researcher concludes that ADDIE Development plays a critical role in blended CPD short course design for educators. Figure 6.14 illustrates the purpose of ADDIE Development based on the findings of Cycles 1, 2 and 3.

Figure 6. 14
ADDIE Development (Cycles 1, 2 and 3)

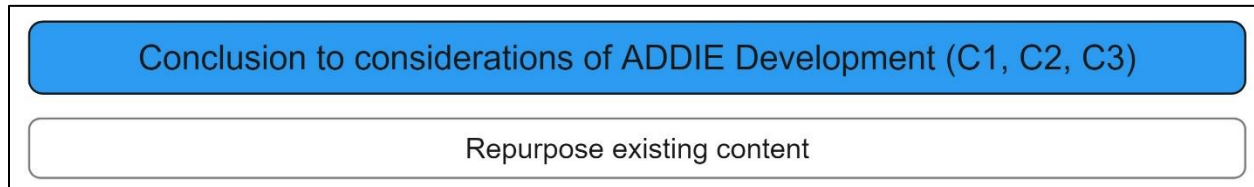


Source: The researcher

The researcher concludes that the purpose of ADDIE Development is to [1] execute design; [2] prepare each lesson; [3] develop course content; and [4] develop supporting material.

Figure 6.15 illustrates the conclusion to the consideration of ADDIE Development based on the findings and results of Cycles 1, 2 and 3.

Figure 6. 15
Considerations of ADDIE Development (Cycles 1, 2 and 3)

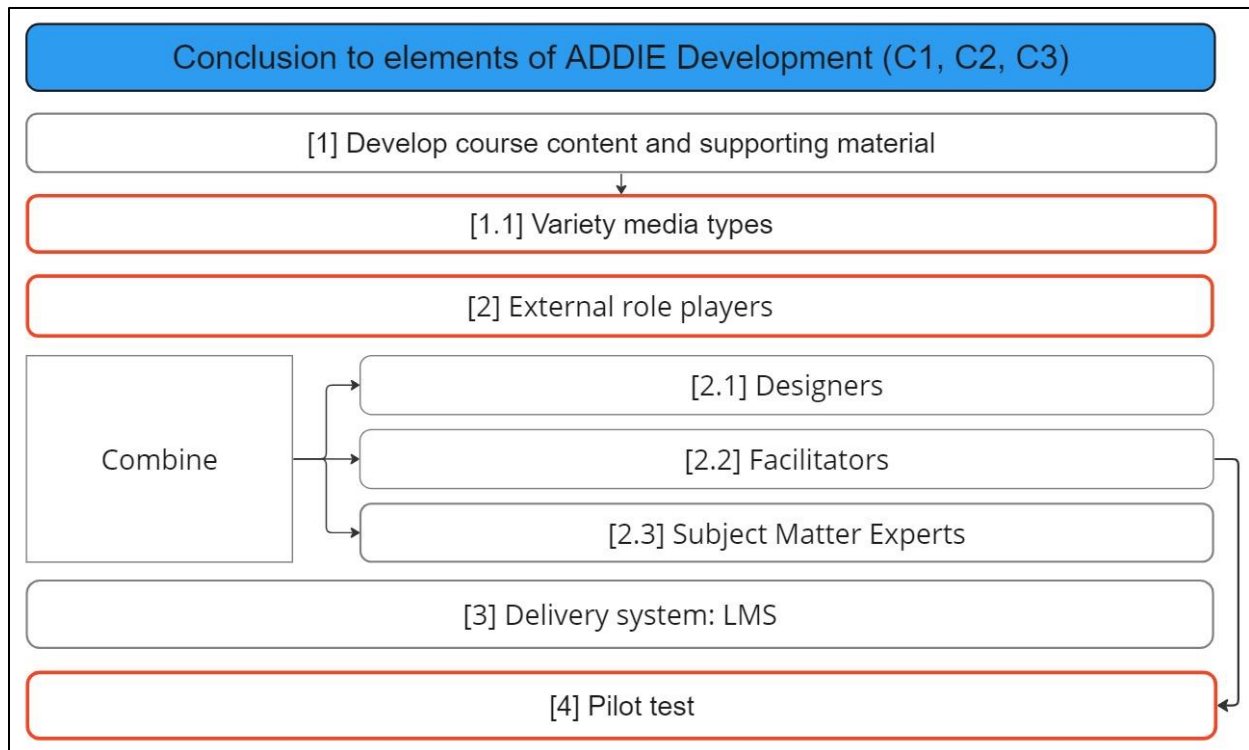


Source: The researcher

The researcher finds one consideration to ADDIE Development. Designers should consider repurposing existing learning material and support material from existing courses in their course catalogue to save time in the development phase.

Lastly, Figure 6.16 illustrates the conclusion to the ADDIE Development Phase, based on the findings and results of Cycles 1, 2 and 3.

Figure 6. 16
ADDIE Development (Cycles 1, 2 and 3)



Source: The researcher

The researcher finds four elements to ADDIE Development. The development phase is used to [1] develop course content and supporting material. Designers are encouraged to develop a [1.1] variety of media types for course implementation. A combination of various [3] external role

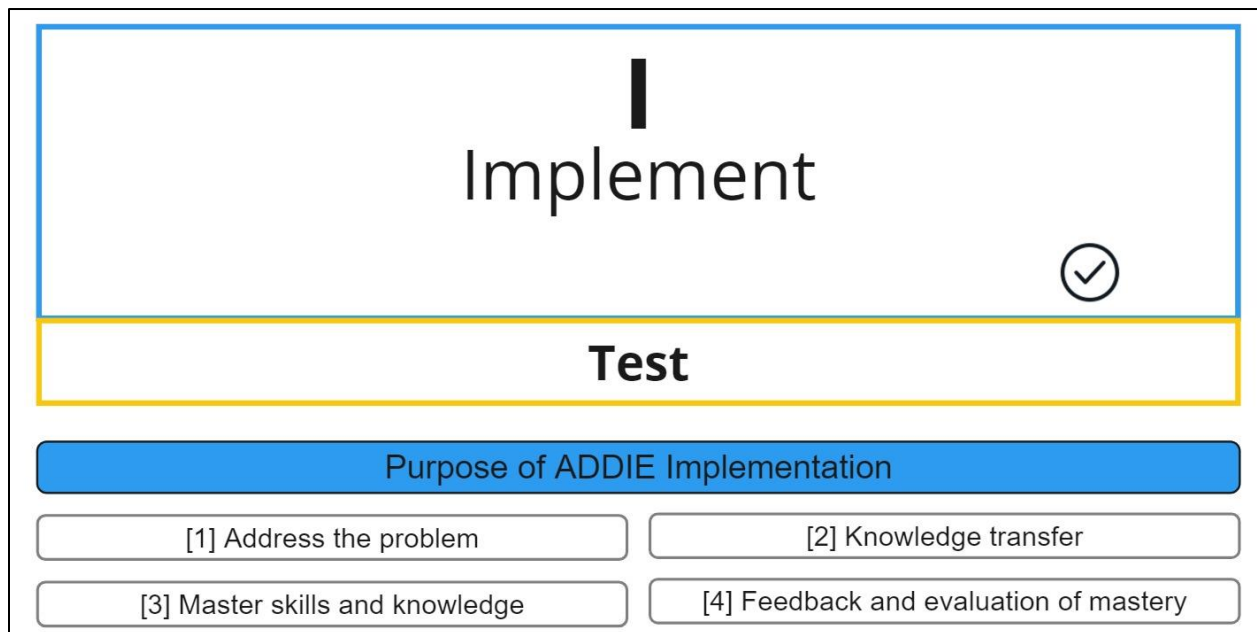
players should be involved in course development, including [2.1] course designers; [2.2] facilitators and [2.3] SMEs. Designers should develop the course with a [3] delivery system in mind. The designer finds that an LMS is a very important element of course development (discussed in greater detail in ‘Blended Learning’ later). A pilot test is found to be an essential element to course development, as feedback obtained through the pilot test prompts essential changes prior to course implementation with real participants.

The conclusion to the findings and results of the purpose, considerations and elements of the ADDIE Implementation phase follows.

6.2.8 ADDIE Implementation

Figure 6.17 illustrates the conclusion to the purpose of ADDIE Implementation based on the findings and results of Cycles 1, 2 and 3.

Figure 6. 17
Purpose of ADDIE Implementation (Cycles 1, 2 and 3)

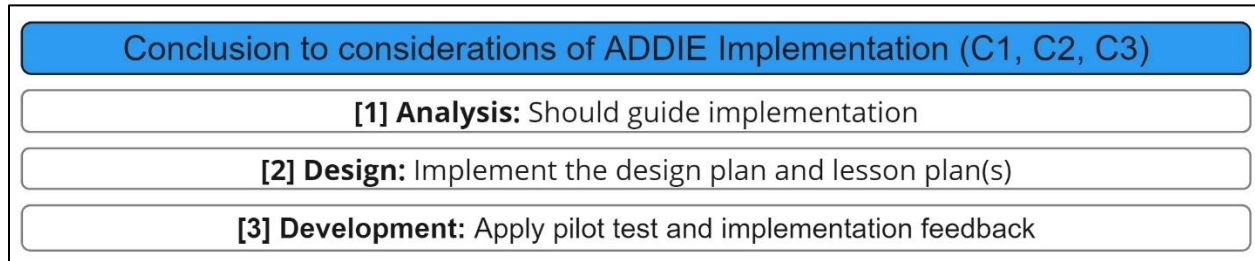


Source: The researcher

Based on the findings and results of Cycles 1, 2 and 3, the researcher concludes that ADDIE Implementation plays a critical role in blended learning design for educators. The purpose of evaluation is to [1] address the problem; [2] transfer knowledge; [3] master skills and knowledge; and [4] provide feedback on mastery.

Figure 6.18 illustrates the conclusion to the purpose and considerations of the ADDIE Implementation phase, based on the findings of Cycles 1, 2 and 3.

Figure 6. 18
Considerations of ADDIE Implementation (Cycles 1, 2 and 3)



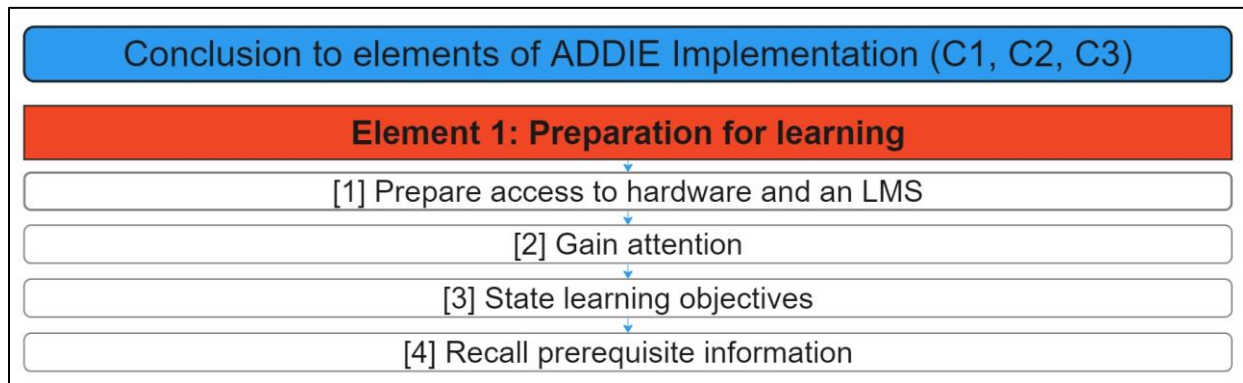
Source: The researcher

Three considerations need to be kept in mind when implementing a blended CPD short course for educators: [1] implementation must be informed by thorough analysis; [2] structure and execution implementation by implementing the Design Plan and lesson plan created in the Design Phase; [3] implement feedback obtained from the pilot test, which was executed in the Development Phase.

Based on the findings and results of Cycles 1, 2 and 3, the researcher concludes that there are three main elements to ADDIE Implementation, namely, [1] Preparation for learning; [2] Delivery and Practice of new information; and [3] Mastery, evaluation, and wrap-up.

Figure 6.19 illustrates the conclusion to the four sub-elements of Element 1: Preparation of Learning after Cycles 1, 2 and 3.

Figure 6. 19
Sub-elements of Element 1 (Cycles 1, 2 and 3)

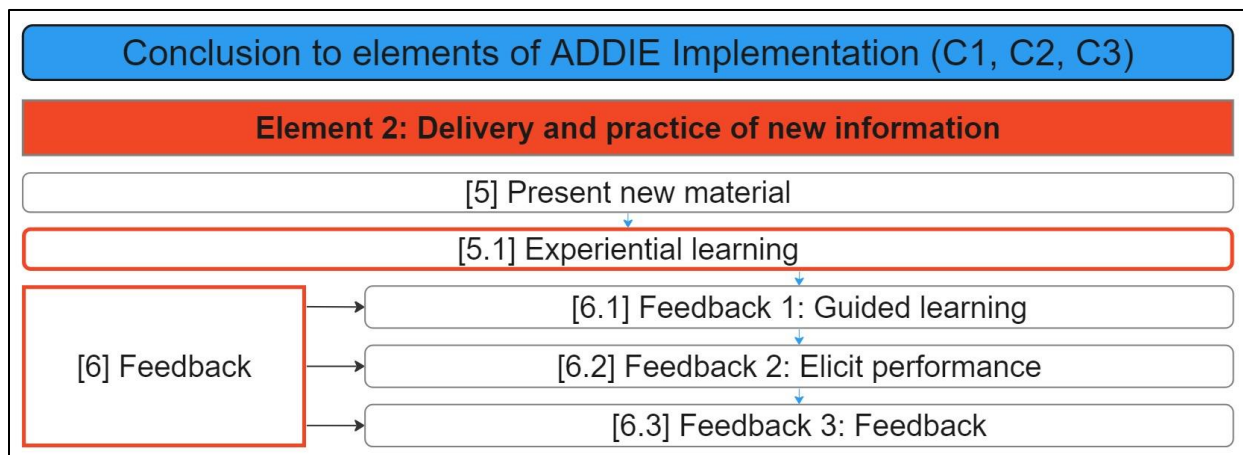


Source: The researcher

Element 1: Preparation for learning involves four sub-elements, namely, [1] preparation for access to hardware and an LMS; [2] gaining the attention of the participants; [3] stating learning objectives; and [4] recalling prerequisite information.

Figure 6.20 illustrates the conclusion to the two sub-elements of Element 2: Delivery and Practice of new information after Cycles 1, 2 and 3.

Figure 6. 20
Sub-elements of Element 2 (Cycles 1, 2 and 3)



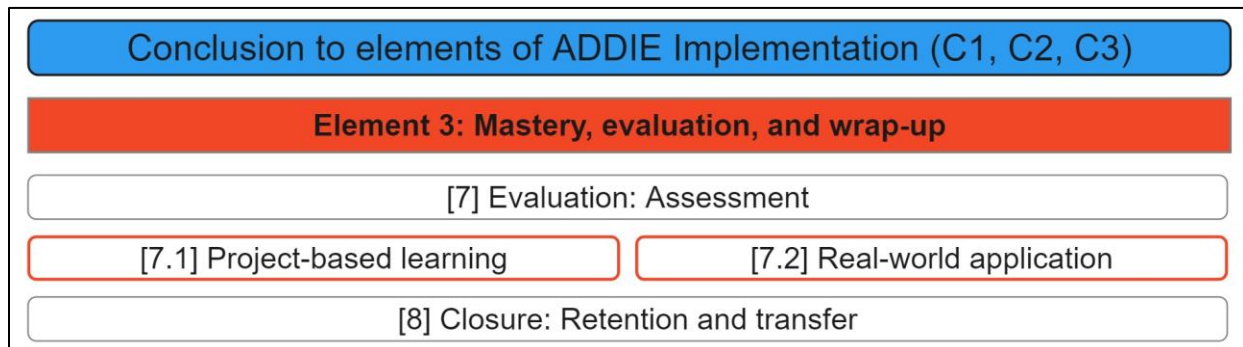
Source: The researcher

Element 2: Delivery and practice of new information involves two sub-elements, namely, [5] presenting new material and [6] providing feedback to learners. When [5] presenting new material to participants, the most effective approach to learning was found to be an [5.1] experiential learning approach. Although [6–6.3] providing feedback is an essential element to delivery and practice of new information, feedback in the form of [6.1] guidance and [6.2] elicitation of new

information was found to be non-essential for adult learners, especially when implementing an experiential learning approach to implementation.

Figure 6.21 illustrates the conclusion to the two sub-elements of Element 3: Mastery, evaluation, and wrap-up after Cycles 1, 2 and 3.

Figure 6.21
Sub-elements of Element 3 (Cycles 1, 2 and 3)



Source: The researcher

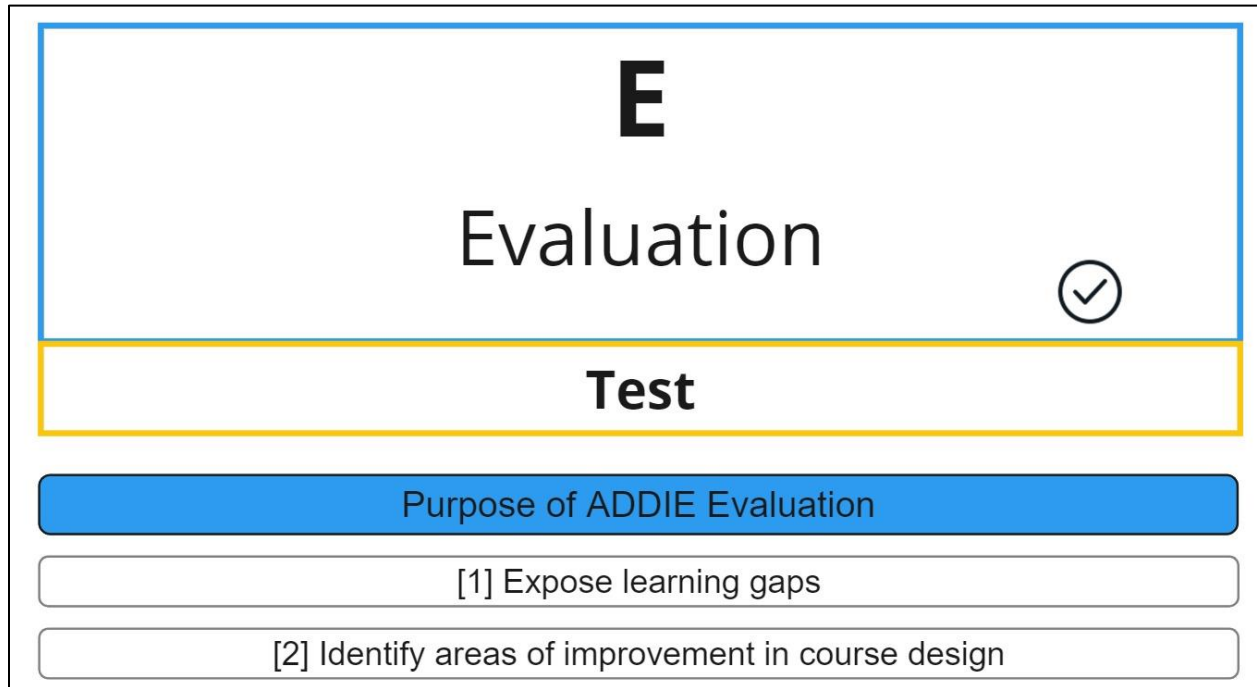
Element 3: Mastery, evaluation, and wrap-up involves three sub-elements. These are [7] evaluation through assessment, including [7.1] project-based learning and [7.2] real-world application, which are key sub-elements to evaluation during implementation. Lastly, implementation should be concluded with [8] a closure, where retention and effectiveness of transfer is evaluated.

The conclusion to the findings and results of the purpose, considerations and elements of the ADDIE Evaluation phase follows.

6.2.9 ADDIE Evaluation

Figure 6.22 illustrates the conclusion to the purpose of ADDIE Evaluation, based on the findings of Cycles 1, 2 and 3.

Figure 6.22
ADDIE Evaluation (Cycles 1, 2 and 3)

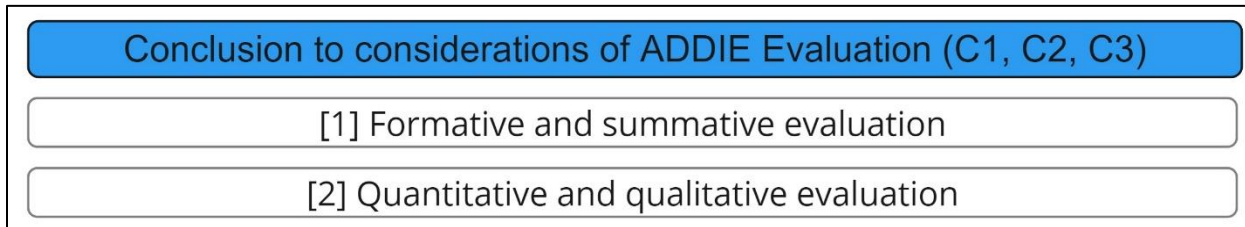


Source: The researcher

Based on the findings and results of Cycles 1, 2 and 3, the researcher concludes that ADDIE Implementation plays a critical role in blended learning design for educators. The researcher concludes that the purpose of ADDIE Evaluation is to [1] expose learning gaps and [2] identify areas of improvement in course design.

Figure 6.23 illustrates the conclusion to the findings and results of ADDIE Evaluation considerations after Cycles 1, 2 and 3.

Figure 6. 23
ADDIE Evaluation (Cycles 1, 2 and 3)

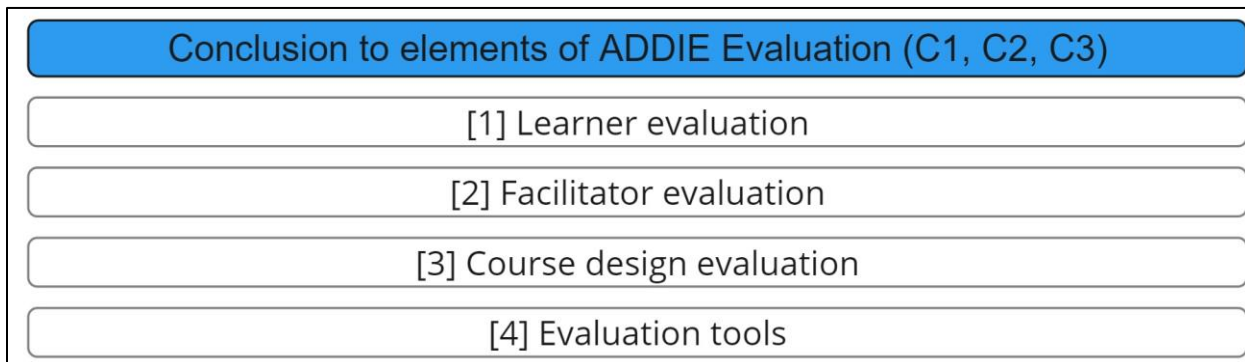


Source: The researcher

Designers should consider which method of evaluation would be most effective in exposing learning gaps and improving course design by a combination of [1] formative and summative evaluation, as well as [2] quantitative and qualitative evaluation.

Figure 6.24 illustrates the conclusion to the elements of ADDIE Evaluation after Cycles 1, 2 and 3.

Figure 6. 24
Elements of ADDIE Evaluation (Cycles 1, 2 and 3)



Source: The researcher

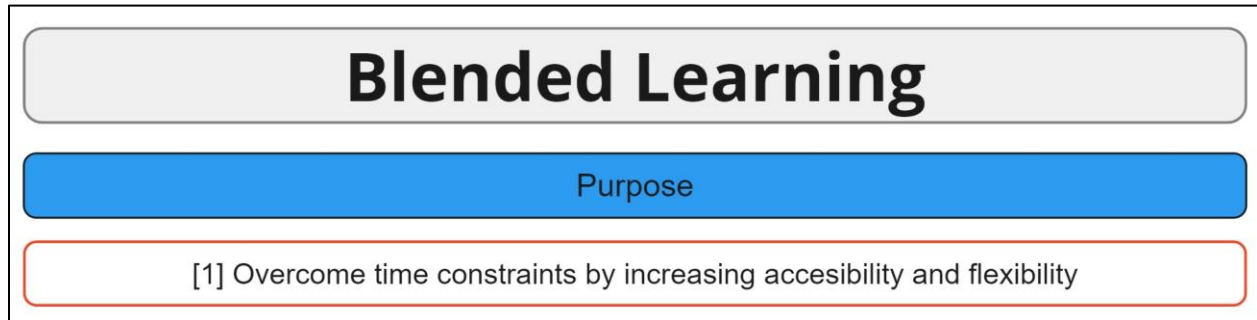
The researcher concludes that there are four elements to ADDIE Evaluation, namely, [1] learner evaluation; [2] facilitator evaluation; [3] course design evaluation; and [4] use of various evaluation tools.

The conclusion to the findings and results of the purpose, considerations and elements of the Blended learning follows.

6.2.10 Blended learning

Figure 6.25 illustrates the combined (Cycles 1, 2 and 3) conclusion to the purpose of blended learning.

Figure 6. 25
Purpose of Blended learning (Cycles 1, 2 and 3)

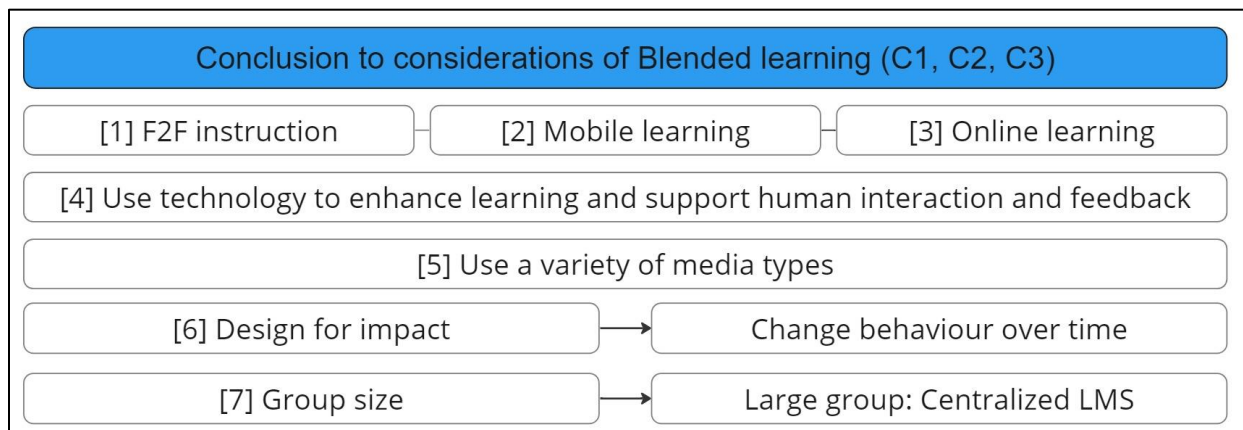


Source: The researcher

Based on the findings of Cycles 1, 2 and 3, the researcher concludes that the purpose of blended learning is to [1] overcome time constraints experienced by adult learners by increasing accessibility and flexibility through implementation of technological software.

Figure 6.26 illustrates the combined (Cycles 1, 2 and 3) conclusion to considerations of blended learning.

Figure 6. 26
Considerations of Blended learning (Cycles 1, 2 and 3)



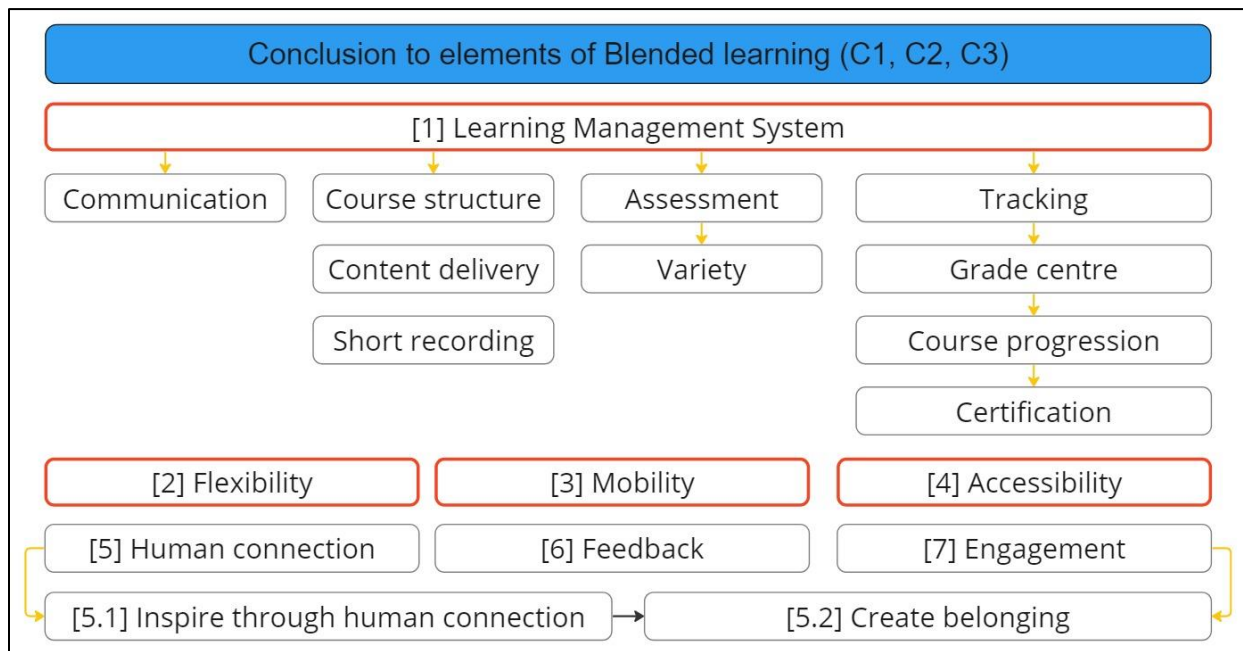
Source: The researcher

The researcher finds that there are seven considerations to blended learning design. A designer should consider various degrees of [1] F2F instruction; [2] mobile learning; and [3] online learning. [4] Technology should be used to enhance learning and support human interaction through

frequent and meaningful feedback. [5] Blended courses should include a variety of media types, especially when using an LMS. [6] Blended courses should be designed for impact and aim to facilitate behavioural change. [7] Designers should adapt course design based on the group size of course participants. Participation by larger groups should be centralised to a suitable LMS.

Figure 6.27 illustrates the combined (Cycles 1, 2 and 3) conclusion for elements of blended learning.

Figure 6.27
Considerations of Blended learning (Cycles 1, 2 and 3)



Source: The researcher

The researcher established seven elements of blended learning design. The use of [1] an LMS is fundamental to blended learning. An LMS should enable seamless communication; course structure; content delivery; recording of synchronous sessions; assessment through a variety of assessment types; tracking of participation; a grade centre; insights into course progression; and certification. Technology integration in a blended course should increase [2] flexibility; [3] mobility; and [4] accessibility. Human [5] connection, [6] feedback and [7] engagement is, however, invaluable to learning programmes. [2] Human connection [2.1] inspires participants and [2.2] creates a sense of belonging for participants.

6.3 Limitations of the study

Shortcomings and limitations of this study included accessibility of literature (C1); relative time elapsed after course design (Cycle 2) and presentation and time constraints for course implementation (Cycle 3).

One shortcoming was identified for the SLR done in Chapter 3, which is that not every piece of literature was accessible for review write-up. There are limitations to what can be accessed due to institutional limitations, language limitations and versions of books which are available only in print. Secondly, a relatively long time elapsed between design and implementation of the ETDP SETA course, referred to in Cycle 2 (Chapter 4), which was presented in 2021, and data collection through a focus group discussion in 2023. Participants seemed to have forgotten some elements and considerations from the design and implementation process, although the focus group discussion format did help to evoke responses and shared memories. Lastly, there were severe time constraints to the implementation of the newly designed course in Cycle 3. There was significant demand from the school on course participants in Cycle 3, who were required to prepare for a school concert, while completing their normal duties, and participating in the course. 70% of course participants completed all course activities, which was, however, still a good completion rate.

6.4 Contributions of the study

The study makes a practical and theoretical contribution in the field of computer integrated education.

6.4.1 Practical contribution

Through this study, the researcher has induced elements and considerations of blended CPD short course design for educators, which practitioners can use when designing short courses of their own. The context of educators, CPD, short courses, and the research focus areas of design elements and blended learning, have been enriched by this study. The research has applied DBR theoretically, reflectively, and practically. The elements and considerations induced in this study can be replicated, transferred, adapted, and tested in other fields of research, professions, and contexts. It can also be compared to other research approaches and ID models.

6.4.2 Methodological contribution

The researcher combined a DBR approach with the ADDIE Model of ID. The DBR process guided the research process, by providing a step-by-step data collection process of Focus, Understand, Define, Conceive, Build and Test, through Cycles 1–3. The integration of ADDIE and DBR fostered a design-based approach to course design, through continuous reflection, evaluation, and adaptation of course design. This integration empowered the researcher to break free from the traditional criticism of the linear nature of the ADDIE Model, and encouraged designers to apply the tested ADDIE process, while continuously improving design and enhancing the effectiveness of the learning process for participants.

6.5 Recommendations for further study

The researcher would be interested to see the application of elements and considerations in fields beyond the education sector, such as helping businesses empower their employees, or the introduction of programmes equipping unemployed citizens with skills and competencies required to address skill shortages in South Africa.

6.6 Final remarks

The researcher walks away from this course with a renewed insight into the complex nature of ID. Having obtained insight into the complexities associated with each individual design project, the researcher understands why experience enables course designers in Cycle 2 to fearlessly approach the course design process and address the needs of participants. The researcher is ultimately reminded that the purpose of any learning programme is to address a learning need, and must be focused on the instructional problem, which is based on the needs, outcomes, and population. By focusing on these elements, a designer can design, deliver, and evaluate mastery of the required skills and empower participants to propel themselves forward with the aid of technology.

The study provides course designers with a framework of elements and considerations, and a design process which can be followed from start to finish. Delivering this design process, for me, is a beacon of hope toward our efforts to empower our– South African people and provide a platform for empowerment to collaborate, to collectively become more than we are, and move our country forward.

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Appendix

The researcher includes appendix A, B and C. Each appendix intends to empower, enhance, and enrich key areas of the findings and results of this study.

Appendix A: ADDIE

Appendix A presents checklists; to-dos and useful material which course designers can use when designing and presenting a course.

Checklist 1: Evaluation of ADDIE Analysis

Appendix Table 1 provides designers with a checklist which can be used to when evaluating ADDIE Analysis. The Analysis Evaluation checklist is compiled from Hodell (2021).

Appendix Table 1
Evaluation during analysis checklist

Evaluation during analysis checklist questions		Yes / No
Is the identified problem a problem that can be fixed by training alone?		
Is the identified problem, a problem that can be improved through a training program?		
Has sufficient data been gathered concerning each of the following:	Population	
	Subject matter	
	Organisational goals	
	Learner goals and needs	
	Logistics	
	Resources	
	Constraints	
Were the analysis results reviewed with each of the following groups or persons:	Stakeholders	
	SMEs	
	Target population sample	
	Other designers	
Were findings compared to other internal or external benchmarks?		
Were each of the above analysis steps double checked?		

Source: Compiled from Hodell (2021)

Checklist 2: Evaluation of ADDIE Design

Evaluation of design takes place during design and once the design process is complete (Hodell, 2021). Evaluation of design includes evaluation of product and process (Hodell, 2021). Evaluation during design saves time and money by identifying design issues before development commences (Hodell, 2021). Appendix Table 2 illustrates a design evaluation checklist. Each item on the checklist should be ticked off prior to commencement of the development phase.

Appendix Table 2
Evaluation during evaluation checklist questions

Evaluation during evaluation checklist questions		Yes / No
Course design plan is developed and ready for implementation.		
All design plan elements were reviewed by the SMEs and at least one other designer.		
All learning objectives and evaluation tasks were reviewed by the SMEs and at least one other designer.		
A lesson plan is developed and ready for implementation.		
Every lesson plan includes each of Gagne's nine events of instruction.		
Responsibility gradually shifts from the facilitator to the participant.		
Decision makers reviewed all design plans and lesson plans.		
Draft design work was signed off by organisation being served.		
Evaluation strategy and materials were reviewed.		
Draft participant materials were reviewed.		
Draft facilitator materials were reviewed.		
Draft media was reviewed.		
Key design elements for evaluation		
Each learning objective clearly stipulates the:	Audience	
	Behavior	
	Condition	
	Degree	
Learning objectives indicate the level of difficulty , according to Blooms Taxonomy, through use of a verb.	Remember ('list')	
	Understand ('explain')	
	Apply	
	Analyse ('compare')	
	Evaluate ('critique')	
Performance agreement: Each learning objective is clearly paired with an evaluation task based on the stipulated:	Behavior	
	Condition	

Checklist 3: Evaluation of ADDIE Development

During evaluation of development, each learning objective, as well as the correlation between objectives, evaluation and behaviour should be evaluated (Hodell, 2021). Appendix Table 3, illustrates a set of 10 questions which can be answered prior to course implementation, according to Hodell (2021).

Appendix Table 3
Course development, pilot test checklist

Question category	Pilot test feedback question	Yes / No
1. Course structure	Is lesson plan design executed and functional?	
2. Facilitator guide	Are facilitator instructions clear and concise?	
3. Facilitator guide	Is the facilitator material appropriate and thorough?	
4. Course content	Is the learner/participant material appropriate and thorough?	
5. Course content	Are the support materials (slides, handouts) appropriate?	
6. Course content	Are technology components (audio, video) appropriate?	
7. Course content	Are segment/module duration estimates accurate?	
8. Presentation	Are instructional methods effective?	
9. Critical reflection	What does not work and how can it be improved?	
10. Critical reflection	What needs to change and for what reason?	

Source: Compiled from Hodell (2021)

Once the pilot test is completed, instructional designers can confirm the following six administrative items are concluded and checked off by the client prior to course implementation (Hodell, 2021). Appendix Table 4 illustrates a post-pilot test implementation checklist.

Appendix Table 4
Pre-implementation checklist

Question category	Pilot test feedback question	Yes / No
1. Finance	Product and production cost confirmed and agreed upon?	
2. Timeline	Production deadlines agreed upon and confirmed in writing?	
3. Course design	Product requirements, specification and variables agreed upon in writing?	
4. Course design	Approval obtained of a sample or prototype of the course material?	
5. Course design	Final approval for all course materials confirmed in writing?	
6. Facilitator training	Pilot test complete, and design improvements implemented to satisfaction?	

Source: Compiled from Hodell (2021)

Appendix Table 5 illustrates an example of an evaluation during development checklist by Hodell (2021). Each item can be checked off before course implementation commences.

Appendix Table 5
Evaluation during development checklist

Evaluation during development checklist questions		Yes / No
Pilot test was completed and each of the following is satisfactory	Segment timing	
	Sufficient learning and supplementary material	
	Course structure is clear	
	Course design is suitable to target population	

Checklist 4: Evaluation of Implementation

Evaluation of implementation takes place once the implementation process is complete (Hodell, 2021). Appendix Table 6 illustrates an example of an evaluation during development checklist, where each item must be checked off before implementation commences.

Appendix Table 6
Evaluation during development checklist

Evaluation during implementation checklist		Yes / No
Each learning objective is paired with an evaluation task.		
Each learning objective clearly states the:	Condition	
	Behaviour	
	Degree	
Each evaluation task is paired with a learning objective.		
Each evaluation task clearly states the:	Condition	
	Behaviour	
	Degree	
Each of the following quality rating rubrics are completed:	QRO	
	QRDP	
	QRLP	

Checklist 4.1: Evaluation of participants' reactions during ADDIE Implementation

Appendix Table 7 illustrates an example of an evaluation of participants' reaction during ADDIE Implementation. Each item can be checked off before implementation commences.

Appendix Table 7

Participant reaction evaluation table

Question example	Yes/No	Qualitative
Would you consider your participation in this course time well spent?	X	
Would you recommend that a co-worker to participate in this course?	X	
What was your favorite content piece/lesson/session/unit in this course?		X
What content piece/lesson/session/unit did you dislike in this course?		X
Were the learning objectives clear to you?	X	
Do you feel like you were able to achieve the learning objectives?	X	
Did you enjoy the way in which the course was presented	X	
Was the facilitation facility comfortable?	X	
Tell us about your experience in the course.		X

Checklist 4.2: Quality rating for Design Plans (QRDP)

Appendix Table 8 illustrates an example of a Quality rating rubric for evaluation of Design Plans during ADDIE Implementation. The QRDP checklist by Hodell (2021) can be used as a checklist when implementing a course Design Plan as discussed in ADDIE Design and ADDIE Implementation.

Appendix Table 8
Quality Rating for Design Plans

Criteria	Maximum value	Rating
Rationale		
Mission	5	
Detail	5	
Format	3	
Population profile		
Clarity	5	
Detail	5	
Challenges	2	
Description		
Course length	3	
Instructional method	3	
Materials	2	
Learning objectives		
Number	5	
Format	5	
Detail	2	
Evaluation strategy		
Detail	5	
Process	5	
Thoroughness	5	
Participant prerequisites		
Clarity	10	
Ranging	5	
Facilitator prerequisites		
Minimum standards	5	
Clarity	5	

Deliverables		
Thoroughness	5	
Clarity	5	
Responsibility	5	
Total	100	

Source: Adapted from Hodell (2021)

Checklist 4.3: Quality rating for Lesson Plans (QRLP)

Appendix Table 9 illustrates an example of a Quality rating rubric for evaluation of Lesson Plans during ADDIE Implementation. The QRLP checklist by Hodell (2021) can be used as a checklist when implementing a course Lesson Plan as discussed in ADDIE Design and ADDIE Implementation.

Appendix Table 9
Quality Rating for Lesson Plans (QRLP)

Criteria	Maximum value	Rating
Gain attention		
Gains attention	5	
Brevity (duration of event)	2	
Relates to content	3	
Transition	2	
State objectives (direction)		
Objectives present	5	
Objective clarity	2	
Transition	2	
Recall prerequisite information		
Prerequisite knowledge covered	3	
Strategy for overqualified participants	2	
Strategy for under qualified participants	2	
Transition	2	
Present new material (content)		
Lively	5	
Clarity	4	
Transition	2	
Application Feedback 1: Guided learning		
50:50 ratio, facilitator-learner engagement	4	
Feedback opportunity provided	4	
Clarity	2	
Transition	3	
Application Feedback 2: Elicit performance		
30:70 ratio, facilitator-learner engagement	4	
Feedback opportunity provided	4	

Clarity	2	
Transition	3	
Application Feedback 3: Feedback		
10:90 ratio, facilitator-learner engagement	4	
Feedback opportunity provided	4	
Clarity	2	
Transition	3	
Evaluation		
Evaluation present	5	
Clarity	2	
Transition	2	
Closure		
Content recapped	4	
Content generalisation	2	
Content synthesis	2	

Source: The researcher

ADDIE Development: SMEs

Hodell (2021) describes five different categories of SME's, and their role in course development. ADDIE Development is described in Chapter 3, section 3.7.3.3. F

Appendix Table 1
Categories of SME's

Subject Matter Expert category	Sub-categories and roles of SMEs
Technical Subject Matter Expert (TSME)	Provide technical knowledge and expertise which form the core of the course content. ADDIE involvement: Analysis, Design, Development and Evaluation.
Functional Subject Matter Expert (FSME)	Experts in functional material and platform development. Includes graphic designers, programmers, web designers, technical writers, photographers, illustrators. ADDIE involvement: Development.
Sentinel Subject Matter Expert (SSME)	Oversees content design and implementation. Takes on a managerial role of content review and approval. Ensure that course content meets professional standards and expectations. ADDIE involvement: Analysis, Design, Development, Implementation and Evaluation.
Instructional Subject Matter Expert (ISME)	Skilled facilitators who can meet unique needs of participants such as teaching foreign languages. Primarily responsible for course implementation and presentation. ADDIE involvement: Implementation and Evaluation.
Hybrid Subject Matter Expert (HSME)	Involved in development and implementation of coursework. Experienced in content and user experience. ADDIE involvement: Analysis, Design, Development, Implementation and Evaluation.

ADDIE Implementation: Implementation timeline

Hodell (2021) suggests various tasks to be completed in preparation of course implementations. Appendix Table 10 illustrates suggested tasks based on an approximate timeline of one week before- one day before and one hour before implementation.

Appendix Table 10
Course implementation tasks

Time before implementation	Task
One week before	Print attendance lists, handouts, evaluation forms and name tags (Hodell, 2021). Contact facilitator(s) and ensure they are ready to facilitate content. Contact implementation facility and share contact details with hosts. Communicate expectation and anticipated procedure.
One day before	For contact classes, the designer should assess room layout, determine internet availability and accessibility and setup and test presentation equipment (laptop, projector, sound system, whiteboard, whiteboard marker, pen, and paper) (Hodell, 2021). Ensure printed material and handouts are ready for implementation; confirm classroom facility is available and ready; set up equipment; share answer keys to first activity with facilitators.
One hour before	Prepare facilitator and participant seating; setup presentation equipment (power cord, laptop, projector, whiteboard); write a welcome note on the board or screen; place participant and facilitator handouts on their tables (or share online if course is presented online); place sign in sheets and name tags at the entrance or on the correct seat; ensure review form is ready ('areas to improve' and 'what went well')

Compiled from Hodell (2021)

ADDIE Implementation: Course delivery methods

Pereira et al. (2021) suggests various course implementation methods. Appendix Table 11 discusses 10 delivery methods with a description of each.

Appendix Table 11
Course delivery methods

Delivery method	Description of methods used
(1) Case-based learning	Use real-life situations to learn in small-or large group format. Short cases are limited to singular events, while long cases mimic how real-life events unfold over time. Each scene in the case is accompanied by questions or guided discussions.
(2) Lectures	Verbal, person-lead introduction to key concepts, and subsequent establishment of foundational knowledge and transfer of new knowledge. Typical duration is between 20 and 45 minutes. Methods can be either didactic (teacher centered) or interactive (including discussions, polls, and reflection).
(3) Reflective exercises	Reflective exercises prompt reflection and lead to transformation. Often draws on emotion and applies to personal context. Can include videos, quotes, reflective questions, or quizzes.
(4) Trigger videos	Short videos of two to four minutes are used to trigger discussion and reflection by challenging prior knowledge and conceptions.
(5) Small group learning	Facilitation of discussions in groups of up to 10 participants. Discussions are largely centered around cases, lecture content, reflective questions, or videos.
(6) Large group learning	Some discussions are facilitated in large group format to reach a wider audience and save time. Interaction is best maintained in groups smaller than 30.
(7) Role play	Role play is used to practice by reenacting real live situations. Role play is focused on developing communication skills drawing out peer- and facilitator feedback in response to actions.
(8) White board;	White boards, blackboards or interactive whiteboards can be used to illustrate points, and especially mathematics processes such as calculations.
(9) Parking lot	Parking lot refers to a question bank or discussion board which include a set of questions which arise during facilitation but cannot be addressed immediately as part of a module's learning outcomes. These points can be listed to come back to at a later stage.
(10) Flipped Classroom	Flipped classroom refers to the use of educational technology, including books, mobile phones, the world wide web or learning management systems to facilitate engagement with lower order cognitive activities outside of classroom settings (Merriam & Baumgartner, 2020). By doing so, higher order cognitive activities, such as problem solving can enjoy preference in the presence of a skilled facilitator or subject matter expert, during contact classes.

Compiled from Pereira et al. (2021)

ADDIE Implementation: Quality Rating Rubrics

Quality Rating (QR) rubrics enable ID'ers to perform quality reviews, on three key design and development elements, objectively (Hodell, 2021). These elements are; quality rating for learning objectives; quality rating for design plans and quality rating for lesson plans (Hodell, 2021). Appendix Figure 1 illustrates three Quality Rating rubrics for evaluation of implementation.

Appendix Figure 1

Evaluation of implementation: Quality rating rubrics

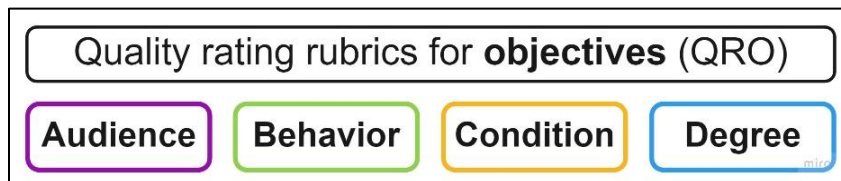


Source: The researcher

Quality rating for objectives (QRO). Quality rating for objectives (QRO) is used to evaluate the quality of each individual learning objective (Hodell, 2021). Appendix Figure 2 illustrates the quality rating rubric for learning objectives.

Appendix Figure 2

Quality rating rubrics for learning objectives



Source: The researcher

The QRO suggests that each learning objective should clearly describe the Audience, Desired behavior, Condition and Degree of performance (Hodell, 2021).

Hodell (2021) suggests that each learning objective should be evaluated through a self-designed, quantitative evaluation system. Each learning objective should clearly include the audience, behavior, condition, and degree. Each objective should be clear, measurable, observable, comprehensive and formatted well (Hodell, 2021).

Quality rating for design plans (QRDP). A design plan serves as the design blueprint for instructional designers (Hodell, 2021). A design plan consists of eight design elements, namely the rationale; population profile; description; learning objectives; evaluation strategy; participant prerequisites; facilitator prerequisites and a list of deliverables (Hodell, 2021). Each design plan element can be evaluated through the QRDP evaluation system (Hodell, 2021). Each of the eight design plan elements are evaluated according to two-to three criteria. Appendix Table 8 in Appendix A provides an example of an adapted QRDP quantitative evaluation table.

Quality rating for lesson plans (QRLP). Quality rating for lesson plans evaluates the implementation of each of Gagné's Nine Events of Instruction, namely: Gain attention; State objectives; Recall prerequisite information; Present new material; Feedback 1: Guided learning; Feedback 2: Elicit performance; Feedback 3: Feedback; Evaluation and Closure (Hodell, 2021). Each lesson plan element should be evaluated through a quantitative evaluation system (Hodell, 2021).

Appendix B: LMS tools

Tool table 1: LMS Content Engagement Tools

Appendix Table 12 illustrates LMS content engagement tools by (Goodson & Nilson, 2017; Hodell, 2021). LMS content engagement tools are discussed in Chapter 3, 3.8.6, Blended Learning.

Appendix Table 12

Student learning tools: Content engagement tools

Content engagement tools	
Syllabus	The syllabus serves as a legal contract between the designer and participant. It stipulates the requirements and rewards you for meeting the requirements. Required elements include the course objectives, deadlines, assignments, grading policies, and contact information.
Materials	Materials supplement or substitute classroom handouts in the form of documents, slides, articles, or textbooks, used for teaching and learning. Online published materials should enhance access to learning material.
Discussion board	Discussion boards facilitate large sections of interaction, engagement, and online participation. Discussion boards can be used for anything, from informal self-introductions to formal assignment submissions.
Glossary-builder	Glossary builders allow students to collaboratively compile a list of keywords and definitions related to the course.

Compiled using (Goodson & Nilson, 2017; Hodell, 2021)

Tool table 2: LMS Communication Tools

Appendix Table 13 illustrates LMS communication tools by (Jalinus et al., 2021; Naidoo et al., 2021). LMS content engagement tools are discussed in Chapter 3, 3.8.6, Blended Learning.

Appendix Table 13

Student learning tools: Communication tools

Communication tools	
Announcements	An announcement area is a tool used for frequent facilitator-participant communication. Often used as a landing page, announcements encourage development of an online community, student motivation and engagement.
E-mails	Emails serve as formal communication of important information, such as welcoming messages, course announcements, or matters relating to formal assignment and grading.
Chatrooms	Chatrooms are used for continuous, informal discussions in the form of posts, comments, or online discussions.
Journals	Journals allow students to reflectively document their journey through the course. Journals can either be private to the student, shared with the instructor or open to all participants. Journals provide insight to learner reactions (level 1 evaluation), and aid designers in adapting coursework, based on students' experience.
Blogs and vlogs	Vlogs and blogs are used to foster an informal online learning community (Merriam & Baumgartner, 2020). Vlogs (video orientated) and blogs (text-oriented) encourage students to informally express their experience, journey, frustrations, both course-related and not.

Compiled using (Jalinus et al., 2021; Naidoo et al., 2021)

Tool table 3: LMS Collaboration tools

Appendix Table 14 illustrates LMS communication tools by (Schindler et al., 2017). A LMS content engagement tool is discussed in Chapter 3, 3.8.6, Blended Learning.

Appendix Table 14

Student learning tool: Collaboration tool

Collaboration engagement tools	
Wiki's	Wiki's allow students to, collaboratively, post and edit content. Wiki's allow quick access to editable information. The only drawback might be the reliability of information in the Wiki since it is not strictly controlled.

Source: Compiled using (Schindler et al., 2017)

Tool table 4: Course operational tools

Appendix Table 15 illustrates LMS communication tools. A LMS course operational tool is discussed in Chapter 3, 3.8.6, Blended Learning.

Appendix Table 15

Course operational tools

Tool	Function
Getting started	Include a 'getting started' page which serves as a course map and helps students navigate the LMS. Give students a step-by-step guide which helps them to master use and functionality of student learning tools.
Calendar	A LMS calendar allows the administrator to link activities, times, and dates, to a calendar, which reduces cognitively load and helps student stay organised and up to date on coursework.
Help	Operational help refers to support pages or support staff which aid students who are experiencing obstacles with the LMS. Common problems include difficulty accessing or posting learning material or assessments.

Source: The researcher

Tool table 5: Course management tools

Appendix Table 16 illustrates LMS communication tools. A LMS course management tool is discussed in Chapter 3, 3.8.6, Blended Learning

Appendix Table 16
LMS course management tools

Tool	Function
Look and feel	Look and feel refers to visual elements which influence user experience. These include fonts, color schemes, shading, style, banners, and landing pages.
Course length	Set opening and closing dates, and course rules which control course access and course participation. Courses can be open for a calendar-bound time-period, duration-bound period, or remain open indefinitely.
Course builder	An LMS allows the administrator to add modules, content, documents, web-links and supporting media.
Course tools availability	Administrators can choose which student learning tools are open for each course. Researchers suggest only opening access to tools which are actively planned and incorporated into the learning program.
Enrolment	Enrolment can be used to control course access and progression. Course administrators can control student, facilitator, guest, and assessor access to the course, and enable preview-access to course sections as a marketing tool.
Evaluation of participation and grading	Evaluation and grading are the most frequently used tools during the implementation phase. Evaluation and grading is used to monitor participation and mastery of learning outcomes. Designers and administrators can choose which learning activities to grade. Evaluation and grading can include feedback in the form of comments (qualitative feedback) or numerical values (quantitative feedback).

Source: The researcher

Table 6: LMS adaptive user interface

Appendix Table 17 illustrates LMS communication tools. A LMS adaptive use interface is discussed in Chapter 3, 3.8.6, Blended Learning

Appendix Table 17
Checklist for LMS course design

Course Beginnings	
Course identification	Make the course clearly identifiable and attractive. An identifiable course ID, and banner with course-related images can be used to increase aesthetic appearance.
Fonts, Colors and Styles	Make content engagement as easy as possible. Clean-, recognisable fonts and contrasting colors are recommended.
Navigation	Use brief, clear names and labels for course areas, and keep your course structure consistent throughout the module.
Syllabus	Create a link to your syllabus at the very beginning of the course and put measures (such as multiple attempt quizzes) in place to ensure students went through the syllabus. Make your assessment schedule available here.
Welcome	Make students feel welcome by introducing yourself, and those who support you in the course through a welcoming message or recording.
Start here tips	Clearly indicate to learners where they should start. Make major online resources, support links and a course schedule available to students from day one.
Outcomes	Make a list or flow chart of learning outcomes and how these outcomes will benefit the students in the future (Goodson & Nilson, 2017).
Orientation	Discuss your syllabus with your students and explain the purpose of the course, course schedule, and technical requirements. Use of media, including text, audio, graphics, or video is welcomed.
Communication	Communicate preferred communication methods and platforms, such as email, social media, or phone. Communicate expectations, boundaries, and availability. Make use of your LMS to streamline announcements and assessment feedback.
Academic integrity expectations	Provide links to academic policies over cheating and plagiarism, if it is an academic course, or relevant to the course.
Directions for getting help	Inform students of support resources available within the organisation, throughout the course. Contact details or links should be readily available to participants.
Technology	
Technical information	State technical requirements and information. Include computer- or browser requirements and links, app store links, if available, as well as contact details for technical support.

LMS Tools	Only use tools with a set purpose and plan.
Other technology choices	Use only familiar, reliable technology, which support self-directed learning.
Student technology choices	Allow variations in assignment submission formats (paper, video, slideshow, podcast, or website), guided by a clear rubric and content expectations for easy assessment.
User-friendly tools and materials	Content should be user friendly and support various learning styles and needs.
Adjustments for students with disabilities	Make your disabled-learning policy, which includes guidelines for extended time or alternative content sources available at the beginning of your course. Use technology to support disability (such as YouTube video scripts).
Assessments and grading	
Rubrics and examples	Provide students with clear rubrics and assignment instructions. Give students examples of good - and bad quality work to communicate grading expectations. Clearly indicate how late-submissions will be treated.
Assessments	Align periodic assessments with learning outcomes and show learning progress toward outcomes (Jonnalagadda et al., 2022; Razak et al., 2020). Develop unique assignments so that participants cannot purchase the assignments online or copy answers from a peer. Use item analysis to identify learning gaps. Provide ungraded assessments such as quizzes to instill confidence in use of technology-based assessment, early in the course.
Instructor feedback	Continually monitor student participation and progress through your LMS. Use feedback to emphasize areas of improvement, use pre-set assignment reminders, monitor login activity, and contact individuals who fall behind. Use emails for formal communication and student feedback.
Final course grades	Clearly indicate grade weighting for various activities, such as discussions, peer reviews, assignments, and tests. Make a link to 'my grades' available for any time access to progress.
Student feedback	Periodically draw out student feedback on course design. Responses can be gathered in the form of discussions or surveys and should identify what design and content areas are most helpful, least helpful, unclear or needs improvement.
Course materials	
Organization	Make organisation simple and visible. Avoid excessive scrolling and categorise content in modules, units or even weekly- or daily content packages.
Content materials	Align course sequence with learning outcomes. Clearly label required and supplementary content. Clearly state the purpose and value of course content.
Learning activities	Clearly align each activity with a learning outcome.
Media variety	Students often prefer video or audio learning over text-based learning (Irawan et al., 2020; Klepsch & Seufert, 2020; Spatioti et al., 2022). Video-based learning, paired with dynamic simulations support self-regulated learning (Mamun et al., 2020).

Academic integrity	Site the sources of all images, videos, audio, websites, and text-content. Comply with online copyright guidelines and your institution's copyright guidelines. Clearly state copyright expectations to students.
Student interactions with the content, instructor, and peers	
Interaction with content	Connect interaction with content to real-world problems. Steer learning toward higher order thinking through application, evaluation and problem solving (Alsaleh, 2020).
Interaction with the instructor	Prioritise human connection (Jalinus et al., 2021; Spatioti et al., 2022). Provide study tips and strategies, connect with- and guide learners who fall behind or go off track and offer continuous learning motivation (Mahardhika et al., 2023).
Interaction with other students	Encourage personal connection (Jalinus et al., 2021), such as sharing goals or photos of participants. Use LMS tools such as a discussion form or a blog to encourage sharing peer-support (Spatioti et al., 2022). Encourage group work and use cloud collaboration to facilitate remote collaboration (Hashim, 2018). Use your LMS to randomly assign student groups

Compiled using multiple authors

Table 7: Software design principles

Table 18 illustrates seven software design principles to add to Chapter 3, 3.8.6, Blended Learning.

Appendix Table 18

Seven software design principles

Software design principle	Description	Application in instructional design
Abstraction	Instructional activities should facilitate cognitive development through inclusion of abstract reasoning tasks.	Develop the ability to reason abstractly by drawing on and manipulating concrete and familiar concepts. Activate prior knowledge and facilitate connection new, abstract knowledge. Make use of visual content and scenario-based learning.
Modularity	Break instructional content into small manageable modules.	Smaller units make content engagement flexible and easily convertible, should course conditions or requirements change (Adnan & Ritzhaupt, 2018; Raza et al., 2020).
Reusability	The ability to reuse or repurpose existing material, content, media, artefacts, and systems in a variety of settings without major modification.	Reusability makes ID cost and effective, which dramatically improve the return on investment following thorough analysis and design.
Compatibility	Compatible design means design in such a way that systems, content, modules, and artefacts can be applied in different environments without major modification.	Course content should be accessible on multiple devices, such as desktop computers, laptops, tablets, smartphones, as well as in printable form, and ensure accessibility. Content in audio, video, image, and text form, as well as interaction platforms should be accessible irrespective of the mode of delivery.
Extensibility	Ability to add new functions, material, and content to the system without major changes.	Design learning material such that new content files can be added or exchanged without extensive cost or time investment. Extensibility includes setting up design styles such that design styles, fonts, and colors do not require each individual resource being modified for a new project. Software tools such as cascading style sheets should also be considered to optimise extensibility.
Scalability	Instructional systems should adapt well to an increasing number of users.	Traditional lecture-based instruction can be adapted to serve a wider audience comfortably. Scalability can be improved through video-recorded lectures, animated videos, discussion forms, multimedia instruction, peer evaluation and cloud collaboration.
Maintainability	Extent of ease with which instructional material can be modified, improved, and restored to previous versions to suit client requirements and needs.	Maintainability is optimised when modularity is optimised. Designers should package and align learning units, material, tasks and evaluation with specific learning outcomes and objectives so that changes to material does not negatively affect outcomes.

Source: Adapted from Adnan and Ritzhaupt (2018)

Appendix C: C2 and C3 data collection

C2: Cycle 2 Template: Voluntary consent letter

LETTER OF CONSENT

(Date)

Dear Staff member

Elements of blended continuous professional development short course design for educators.

My name is Martin Mouton. I am a Masters student at the (Faculty) at the (University). I am conducting a study that is aimed at unearthing the elements which should be included in blended continuous professional development short course design. I hereby humbly request that you participate in this research and accompany me in the exploration of elements and considerations that lead to meaningful learning in a blended learning course.

I would like to involve you in this research through your participation in a focus group discussion. The researcher anticipates that focus group discussion and/or interviews will take no more than two hours. I will note observations during our discussion, which I will gladly share with you. The interview will be audio recorded and used for verbatim transcriptions. The results of the interviews will only be available to myself and my two supervisors, (name and surname) and (name and surname).

The results will be used to establish elements of blended short course design, for continuous professional development. The researcher will follow the principles of design-based research and the ADDIE Model of ID. The results may also be utilised by researchers at the University of Pretoria for dissemination in journal articles and conference proceedings. The results and findings of the research will inform educators as well as developers of training, support, planning and implementation of educational technology in teaching and learning.

The research will focus on the teachers' experience of course design in a blended learning environment. Enabling and disabling determinants of course design is welcomed as part of the research data, though the researcher will focus on enabling determinants.

I would also like to request your permission to use your data, confidentially and anonymously, for further research purposes, as the data sets are the intellectual property of the (higher education institution). Further research may include secondary data analysis and using the data for teaching purposes. The confidentiality and privacy applicable to this study will be binding on future research studies.

Should you agree to participate, please read the following:

- I consent that data from the survey, focus group, interview, observation and field notes can be used for research purposes in this Masters research project as well as for dissemination in research output as indicated in this letter.
- We would also like to request your permission to conduct the above-mentioned research at your department and use the data, confidentially and anonymously, for further research purposes, as the data sets are the intellectual property of the University of Pretoria. Further research may include secondary data analysis using the data for teaching purposes. The confidentiality and privacy applicable to this study will be binding on future research studies.
- Due to COVID-19 and to minimise the spread of infection, the research may be conducted online or through various other media platforms.
- Since your participation in the study is voluntary, please note that no participants will receive any monetary awards or awards in kind.

I acknowledge that:

- I have been informed that participation is voluntary, and I am free to withdraw from the project at any time without explanation or prejudice and to withdraw any unprocessed data previously supplied.
- I have been informed that the confidentiality of the information collected will be safeguarded.
- My educational environment as well as I will be referred to by pseudonyms that are randomly generated in any publications arising from the research. The episodic interview activation points will be provided in hard copy to you on the day of the interview. By signing the consent letter on the next page, you give your consent for your participation in the study, that you are assured of confidentiality and anonymity, and know that you can withdraw if you do not wish to participate any more, by informing the researcher.

I look forward to learning with you!

Warm Regards

(Research name and surname)

RESEARCH CONSENT

(Date)

I, _____, the undersigned hereby

Consent to the research as explained in the adjoining letter.

Do not consent to the research as explained in the adjoining letter.

I also understand that, although I have been invited to participate in this research, my participation is completely voluntary and that I can withdraw from this study at any point time without explanation or prejudice and that I can withdraw any unprocessed data that I have previously supplied.

I understand that my confidentiality will be maintained with pseudonyms that are randomly generated and that I will remain anonymous in all future disseminations of this research.

Research Participant

(Name and surname) (The researcher)

(Name and surname) (Supervisor)

C2. Cycle 2 Focus Group questions

C2: ETDP SETA

Data collection instrument 1: Focus Group Discussion

The purpose of *Data Collection instrument 1: Survey*, is to answer the first sub-research question, namely: What are the design elements of an existing blended CPD short course for educators?

At the end of C2, the researcher should be able to establish the second set of design elements (E2) by gathering information from course designers.

PROTOCOL:

1. Discuss voluntary consent and consent letter.
2. Recording video and audio via OBS.
3. Recording with researcher and Participant 2's devices separately for backup.
4. Upload to YouTube/OTTERAI and export audio to text.
5. O-transcribe, insert text file, and upload audio and check for errors. Send result to P1 and P2 for checking.
6. Analysis of text: **pre-existing themes** and **emerging themes**

Introduction to the course:

1. Please give me an overview of the course. How did it happen that you designed and implemented this course?

Context Element 1: Educators

1. Please share what you found to be the most important considerations and elements which influenced your design and implementation decisions for your short learning program.

Context Element 2: Continuous Professional Development

1. How did your course facilitate Continuous Professional Development for your participants.
 - a. What was the participants' expectation, coming into the course?
 - b. How did you design and implement your course to meet the needs of the participants?

Context Element 3: Short course

1. What informed your decision about the duration of the course you designed in and implemented?
 - a. What was the duration of the course?

- b. What were the time-limitations for you as designers?
- c. What were the time-limitations for your participants?
- d. How did you overcome the time-limitations?

Focus area 1: Design Element - ADDIE Model

1. Describe the process you followed to systematically guide you from the day you started course preparation, to the final day of contact with your participants (upon conclusion of the course)?

ADDIE ANALYSIS:

1. What are the most important aspects of analysis when preparing for course design.

ADDIE DESIGN:

1. Describe what you keep in mind when planning a course (from a holistic perspective).
- Alignment
2. 9 Elements of Gagné Nine Events of Instruction
3. Describe what you need to keep in mind when planning individual lessons or engagements.

ADDIE DEVELOPMENT:

1. Other than yourselves, who else was involved in development of the engagements, content and supporting material?
2. How did you test the effectiveness of the design plan and individual lesson plans before official implementation with real participants?

ADDIE Implementation:

1. Describe what implementation of the course looked like in your course.
2. How did your process and preparation for implementation inform your implementation decisions?
3. How did you introduce your participants to new content and facilitate mastery?
4. How did you evaluate effectiveness of your implementation and design during implementation.
5. How did evaluation affect your implementation of future lessons?

ADDIE Evaluation:

1. How did you perform evaluation?
2. What was the purpose of performing evaluation in your course?
3. How did your evaluation results influence your design decisions for future iterations of the course, or similar courses?

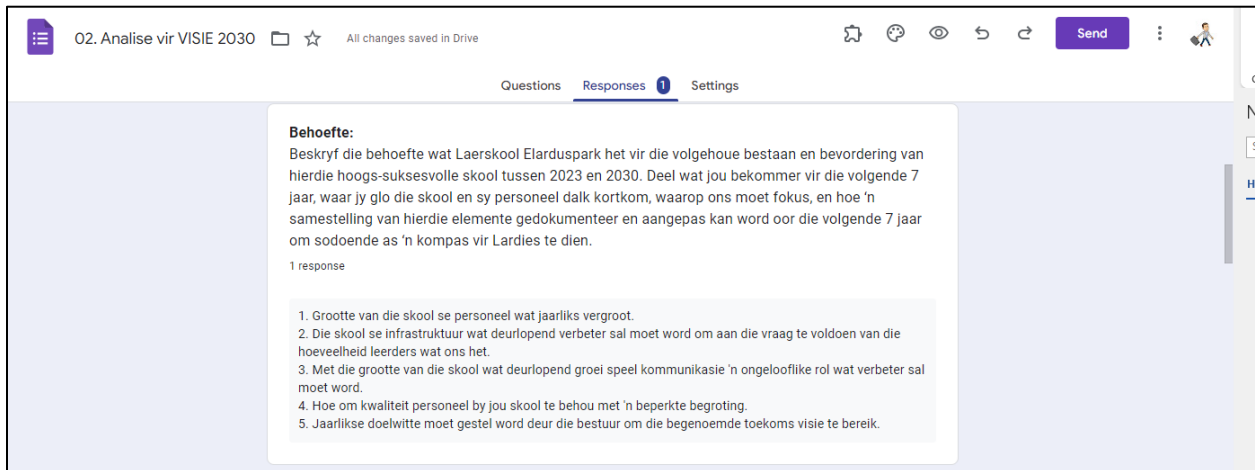
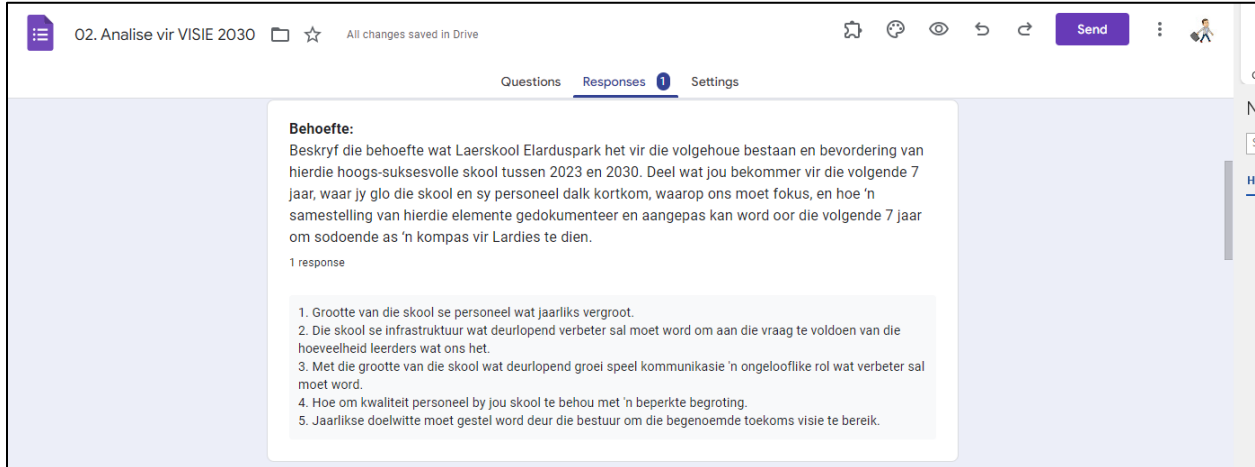
Focus area 2: Blended Learning

1. Why did you opt for a blended learning program instead of a fully online or fully F2F course?
2. How did course participants benefit from the decision to present the course in a **blended format**?
3. Which ICT tools and programs were most important to the success of the course and why?
 - a. What was the role of the LMS specifically to the success of the course.
 - b. Check role of WhatsApp group.
 - c. Check role of access to hardware and internet connectivity.
4. In your view, how did human interaction, through course presenters, group facilitators, and peer-interaction contribute to the success of the course?
 - a. Orientation to course in person
 - b. Peer-support

C3. Cycle 3 pre-course analysis survey

Appendix Figure 3 presents an example of the pre-course analysis survey response by the Deputy Principal of the school. The survey addressed the needs; outcomes; timeline; delivery method and to identify ten course participants. Responses from the pre-course analysis survey were used to inform design decisions in C3.

Appendix Figure 3
Pre-course analysis survey



C3. Research questionnaire.

Research Questionnaire 1

Course Design: VISIE 2030

Research Title:

Elements of blended continuous professional development short course design for educators

Data collection instrument 1: Questionnaire

C3: Laerskool Elarduspark

The purpose of Data Collection instrument 1: Questionnaire, is to answer the third sub-research question, namely: ***What are the design elements of a newly developed blended CPD short course for educators, based on educators' experience of course design?***

At the end of C3, the researcher should be able to establish the third set of design elements (E3) by gathering information from course participants. The researcher will combine the findings from Cycles 1, 2 and 3 to answer the main research question: ***What elements should be included during blended CPD short course design for educators?***

This questionnaire is made up of 40 questions. Microsoft suggests that it should take approximately 20 minutes to complete. Please answer all questions as thoroughly as you can to ensure rich data is generated. You can answer in English or Afrikaans.

7. I understand that my participation in this questionnaire is voluntary. *Voluntary participation means that participants exercise free will in their decision to partake in the research activity (Given, 2008; Lavrakas, 2008). Participants are not coerced; not unduly influenced and have foreknowledge of the risks and benefits of participation (Lavrakas, 2008).*

YES

8. I understand that my inputs as result of my participation in this questionnaire will be anonymously used when findings and results are written up in the dissertation. *Anonymity refers to the state of being unknown and unidentifiable (Given, 2008; Lavrakas, 2008). Anonymity is achieved by de-identifying participants and any unique characteristics from publicly available data (Lavrakas, 2008). The study offers partial anonymity through the use pseudonyms (Given, 2008).*

YES

9. I understand that my input as a result of my participation in this questionnaire will be treated with confidentiality.

Confidentiality is associated with privacy, intimacy, trust and the protection of data and the identities of participants (Given, 2008; Lavrakas, 2008).

YES

10. I understand that I participate in this questionnaire from the position of informed consent. *Informed consent requires provision of adequate information about the study, prior to commencement (Given, 2008). Participants must be informed of the purpose, duration, expectation, risks and discomforts, benefits, extent of confidentiality and an awareness of the freedom associated with voluntary participation in the study (Lavrakas, 2008).*

YES

Section 2: Participant personal information

Please provide the researcher with basic personal information. This information is gathered solely for the purpose of asking questions, obtaining clarity on responses and engagement post-completion (if required).

2. Participant name and surname
3. Participant role at (the school)
 - a. Teacher.
 - b. Leadership role: Grade head.
 - c. Leadership role: Head of Department.
 - d. Leadership role: Vice-principle.
 - e. Leadership role: Principle.

Section 3: Context 1: Educators

1. What is the biggest limiting factor for continuous teacher training and development in your school?
2. Do you experience that your staff's proficiency levels differ significantly? How do these differences in skillsets benefit or disadvantage your school?
3. Do you prefer courses which encourage application to your school context or theoretical programs which address broad educational topics? Why do you prefer these?

Section 4: Context Element 2: Continuous Professional Development

1. Why is it important that your teachers participate in continuous training and development as life-long learners?
2. Do you feel like short courses for CPD should be delivered in-person, fully online or through a combination of the two methods (blended)?
 - a. Fully in-person.
 - b. Fully online.
 - c. A combination of in-person and online training.
3. Please share why you prefer this delivery method.
4. Would you prefer for your teachers to participate in a once-off training program, once per year, or a series of related training programs which follow on and build on each other spread across the year?
 - a. Once-off training program, once per year.
 - b. A series of related training programs which follow on and build on each other spread across the year?
5. Why do you prefer this approach?

Section 5: Context Element 3: Short course

1. What is the ideal duration of a short learning program for continuous professional development at your school? Why do you say so?
2. What is the most important and urgent area of development for your teaching staff over the next 12 months?

Section 6: ADDIE Analysis

1. ADDIE Analysis CONSIDERATIONS

Please tick the considerations that designers should keep in mind before presenting a course at your school. You can select yes if you feel a designer must consider this, and no, if you feel the designer need not consider this.

- a. Who will participate in the course.
- b. What is the course about.
- c. Why would people participate in this course.
- d. When will the course take place.
- e. Where will the course take place.
- f. At times, a problem or need at our institution is such that we need someone to do a deeper analysis of our teaching staff, tasks, and processes to identify problems that we cannot fully address ourselves.

2. Elements of ADDIE Analysis

Please tick the elements that designers should keep in mind before presenting a course at your school. You can select yes if you feel a designer must consider this, and no, if you feel the designer need not consider this.

- a. Needs of the school and participants
- b. Outcomes to be attained from implementation of the programme.
- c. Population (an understanding of the context and characteristics of the staff members who will be participating in the course)
- d. Budget
- e. Time constraints
- f. Other (please specify)

3. Is there anything else you would want the designer to keep in mind when designing a training program for your teachers?
4. Project proposal

Before a short course is presented at our school, we would expect the designer and facilitator to have a clear understanding of the following:

 - a. The characteristics and needs of our staff members.
 - b. Have a set of established learning outcomes, which he/she wants to achieve by presenting the course.
 - c. Have a clear idea of if, and how they are going to assess whether the teachers learned something from participation in the course.
 - d. Have activities in place to draw teacher participation in the short course.
 - e. Delivery method (online, in-person, blended).
 - f. Other (please specify).

Section 7: ADDIE Design

1. Design considerations.

Please select all the statements which you agree with.

- a. Our teachers benefit when a training program is broken up into separate modules/units, rather than one long presentation which covers all training topics for the year at once.
 - b. Our teachers prefer training courses which include a variety of media types, such as pictures, audio, video, and text.
 - c. The designer should design the course, knowing whether the course will be presented in person, online or as a combination of the two methods.
 - d. We prefer that the person who will physically facilitate the training is involved in the design process.
2. Is there anything else you would want the designer to consider when designing a training program for your teachers?

3. Element 1: ADDIE Design Plan

Look at the statements below. Select all the statements regarding elements which you feel should be very clearly understood and decided upon when designing a course?

- a. Rationale: A course should include a clear reason for implementing the course
- b. Population profile: The designer should have a clear understanding of who will be participating in the course and should then design the course with the specific population profile in mind.
- c. Course description: It will benefit the participants if the course includes a clear course description, describing what the course or training session is about.
- d. Objectives: The course participants should know exactly which skills and knowledge they should master by participating and completing the course.
- e. Teaching strategy: We expect the designer to plan his teaching approach and to communicate clearly what he expects from our teachers.
- f. Evaluation strategy: We expect the designer to plan his evaluation approach and to communicate clearly how learning and mastery will be evaluated.
- g. Prerequisites: We expect that the course would make use of competent facilitators, and that the course will be designed with a specific group of people in mind (e.g., primary school educators; mathematics educators; senior phase educators; female educators etc.)
- h. Deliverables: We expect a designer to prepare and have a set of documents at hand if he/she expects us to complete written activities or work through theoretical coursework (e.g., a PowerPoint presentation).

4. Element 2: Lesson Plan

Please tick the main events you would want the designer to prepare when designing individual lessons.

- a. Phase 1: Prepare participants for learning by gaining attention, stating objectives for the lesson and recalling prerequisite information.
- b. Phase 2: Deliver and practice new information, including presentation of new content, guidance by the facilitator and an opportunity for participants to share their knowledge and experience, while asking for feedback from the facilitator.
- c. Phase 3: Mastery evaluation and wrap-up through assessment, real-world application, and a closure.
- d. Other (please specify)

5. Element 2: Teaching strategy

Please select your preference regarding delivery and practice of new information in individual lessons/sessions.

- a. I prefer that the facilitator as a subject matter expert come to our school and share new information with us, while the participants sit and observe the presentation passively.
- b. I prefer that the facilitator takes the lead when presenting new information, but that the facilitator gradually shifts the responsibility for learning and personal application from himself to our teacher.
- c. I prefer that the facilitator challenges the teacher to learn through trial and error, sharing their thoughts, asking questions and depending on one another for support and feedback. For this approach, the facilitator is not a presenter, but a facilitator, guiding our teachers when they get stuck, but putting most responsibility for their learning on themselves.

Section 8: ADDIE Development

4. Consideration: Course content and supporting material.

Reorganise the following content types based on the content types you enjoy most when a course is being presented at your school.

- a. Text in the form of textbooks, printouts.
- b. Audio in the form of recordings of presentations, music.
- c. Video.
- d. Pictures.
- e. Facilitator-led verbal training.
- f. A combination of various text, audio, video, picture, and facilitator led training.
- g. Use of a Learning Management System such as Google Classroom as the primary place of instruction.

5. I prefer training which is presented:

- a. Internally by one of our staff members.
- b. By external subject matter experts.
- c. A combination of our staff members and external subject matter experts.

6. Why do you prefer this method of presentation?
7. Why do you think it is important for a designer and facilitator to test and implement a course before truly implementing it in your school?

Section 9: ADDIE Implementation

1. Preparation for learning: When implementing a course, what is an effective way to gain attention?
2. Preparation for learning: Why is it important for the facilitator to state objectives?
3. Preparation for learning: How can a designer/facilitator recall prerequisite information?
4. Delivery and practice of new information: What did you enjoy about the way new information was presented in this course?
5. Delivery and practice of new information: How did the feedback you received from peers and facilitators help you to complete the activities and final evaluation?
6. Delivery and practice of new information: Rank the teaching strategies for adult learners from the approach you would prefer most (top) to least (bottom).
 - a. Facilitator led training and discussion.
 - b. Experiential learning (learning by doing).
 - c. Learning by assessment.

Section 10: ADDIE Evaluation

1. How do you currently know whether your educators learned something from a CPD program at your school? How is evaluation done and mastery of skills and abilities demonstrated?
2. How would the implementation of activities and evaluation tasks which address real-world problems in your school benefit the school and educators?

Section 11: Blended learning

1. How does the utilisation of technology in teacher training benefit teacher CPD?
2. How does human connection (peer-to-peer and peer-to-facilitator) benefit teacher CPD?
3. How can technology integration in teacher training unlock new opportunities for teacher training and development?