Further education teachers adaptation to the introduction of AI in a UDL-empowered environment.

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Abstract

This study aims to explore how teachers in further education are adapting to the introduction of generative AI in their practice. Generative AI has quickly become a topic of discussion within academic circles. Focusing on generative AI's ability to relieve time pressures (Lameras, 2022) while others focus on the academic integrity issues that can arise (Pearce, 2024; Vashista et al., 2023). It has been proven that teachers can not reliably ascertain if work is created by AI or students (Fleckenstein et al., 2024). Exploring the use of generative AI in a teacher's practice is of paramount importance, as is evaluating ways in which generative AI can be used to enhance learning and implementing the new tool in a new and meaningful way. This study is conducted as a cross-sectional study following a qualitative IPA approach outlined by Smith et al. (2022). Data was collected through a semi-structured interview process with five participants. All participants participated voluntarily through interviews conducted online using the Teams software with auto transcription. Transcriptions were analysed in line with Smith et al. (2022) guidelines. Generative AI has been developing as a tool throughout the last few years, and so has the teacher's implementation of such. While the blanket use of generative AI is not recommended, the use of generative AI as an active roleplaying participant or feedback agent within the classroom with the teacher's guidance demonstrated a strong link between generative AI and creating engaging classroom activities. CPD in the area of generative AI is highlighted with teacher recommendations on how best to approach CPD.

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List of Abbreviations

AI = Artifisal Intelligence

CPD = Continuous Professional Development

FE = Further Education

FET = Further Education and Training

Gen AI = Generative AI

GDPR = General Data Protection Regulation

MCQ = Multiple Choice Question

MIMLO = Minimum intended module learning outcome

ICT = Information and communications Technology

IPA = Interpretive Phenomenological Approach

NCI = National College of Ireland

QQI = Quality and Qualifications Ireland

TEL = Technology Enhanced Learning

TPACK = Technological Pedagogical Content Knowledge

UDL = Universal Design for Learning

Declaration of Technology used during this project.

Microsoft Word

Microsoft Teams

One Drive

Draw.io (for Images and Graphics and visual representation of themes)

Grammarly (for spelling and grammar)

1. Chapter 1: Introduction

AI was first coined in 1956 by John McCarthy. 67 years later, AI has continued to develop with the creation of generative AI in recent years (Baidoo-Anu & Owusu Ansah, 2023). While AI has been used as a term to describe many technologies as described by Lameras (2022) AI is now a household term, with Siri and Alexa being the most prominent examples of AI. Generative AI is synonymous with ChatGPT (OpenAI, 2024). ChatGPT is not the only AI presented in this study. However, it is the one that is discussed the most by the literature. This paper will explore the experience of teachers in further education and their adaptation to the use of generative AI in their active practice.

This project hopes to expose critical areas of concern in relation to AI and the teacher's perspective, along with suggestions on how the introduction of generative AI can augment traditional theories and pedagogies of teaching. Some participants who took part in this research project are reluctant to embrace generative AI in their practice. Others are adapting and utilising AI in meaningful ways. Generative AI is not a one-size-fits-all approach to accommodate all learners within a classroom. It may, however, be another mode of action expression and representation that fits within a Universal Design for Learning framework (UDL) (CAST, 2024). Historically, UDL has faced challenges with teacher adoption, with some teachers viewing UDL as being for students with disabilities (Altowairiki, 2023), Altowairiki (2023) also highlights that it can be challenging to change the teacher's approach to teaching and learning in higher education. As such, the introduction of generative AI appears to follow a similar path, with some teachers adopting the new technology and others rejecting the possible benefits.

Generative AI within the classroom is not without issues, as outlined by QQI (2023) not all students may have access to the technology, Neumann et al. (2023) highlights the limited success of using software to detect AI-generated content. The introduction of generative AI has caused disruption. Qadir (2023) explained that this disruption is normal for the introduction of new technologies, Altowairiki (2023) highlights that teachers are responsible for investing in their teaching practice. As such, establishing a grounding which teachers can use to improve their teaching practice is of paramount importance. This represents one of the core driving factors of this research, improving teaching practice on an individual level.

1.1 Outline of research topic

Artificial Intelligence (AI) is a term first coined in 1956 (Slimi & Carballido, 2023) since 1956, there has been an explosion of technologies that fall under the umbrella of AI. Many types of software fall within the AI category from virtual learning environments (Lameras, 2022) to computer vision (Vashista et al., 2023). Evaluating the new version of AI, known as generative AI, can provide more insight into how FE teachers may be able to implement generative AI in a new and innovative (Jong, 2022) way.

Establishing the difference between the types of generative AI can assist in dispelling some of the mystique around the topic. Qadir (2023) explains that introducing new technologies can disrupt established practices. This disruption may not always represent a negative (Wong & Mahmud, 2023) highlight the forced change to online learning environments during the COVID-19 pandemic, resulting in new and adaptive teaching methods to be established and refined.

Generative AI may provide another opportunity to adapt and refine teaching methods once again. This time, however, it appears to be a choice. QQI (2023) state

that the individual is responsible for how they address and implement generative AI in their teaching methods and that this should be in alignment with the guidelines of the college in which they are working. Clark (2024) expresses the need for people who are involved with education to explore the area of generative AI more. Clark describes the introduction of generative AI as a way to reduce the workload of non-teaching tasks and as a way to support learning, adapting to each learner's individualised journey. Some teachers may not be confident in the use of technology or able to invest the time needed to ensure the correct and valid implementation of generative AI within their classrooms. Prensky (2001) explains the difference between digital natives and digital immigrants, a concept that is not limited to students but expands to all people, including teachers.

The adaption of teachers to new and emerging situations is part of their everyday. Learner uniqueness and UDL (CAST, 2024) helps guide this change and adaptation. The effective use of UDL is connected with the training received Bastoni et al. (2023) explains how teacher preparedness and job satisfaction are linked to one another and how this is facilitated through teacher training. While training is not the only factor in the effective use of UDL, with communities of practice and mindsets being a driving factor, at this stage in generative AI's availability, training could be the most fruitful way in which to encourage teacher engagement and reduction of apprehension around generative AI. The implementation of generative AI as a teaching tool is still in the early stages, and the ethical concerns of implementing generative AI still need to be fully explored. How AI can affect teaching and learning is still unknown. This project hopes to provide a grounding to establish how generative AI is being leveraged within a UDL-empowered environment and

provide to the ever-growing literature around generative AI and education. First, we need to know the effect of AI on teachers before the impact can be improved.

1.2 Theoretical and practice context of the study

1.2.1 Technology as part of education

This project was conducted in the east of Ireland at a college of further education. The college delivers multiple courses across many disciplines, ranging from traditional high arts to digital media creation, science, music, and maths. The college offers these classes to students who have completed their leaving certificate and/or are 18 years or older. The researcher for this project is a teacher at the college, teaching on digital media and business courses. The introduction of generative AI has created a new area for the researcher to explore in their core subjects, as generative AI has been used in the game industry with mixed reviews from the public. As such, students enter the classroom with the knowledge and understanding that generative AI can be used to create content for games. Therefore, it is of paramount importance for the researcher to understand generative AI better, what its limitations are in both the classroom and in media creation, and if there is a way to leverage the power of generative AI to make class content and assessment more assessable to students while ensuring deepening learning and assessment validity.

The theoretical foundation for this project aligns with two established frameworks that have been used in education and learning for quite some time. The first is UDL. UDL represents a framework that encourages the introduction of technology (Yuwono et al., 2023). This provides an area in which generative AI may be introduced into an established framework that is designed to work on an iterative

basis (Altowairiki, 2023). The second pillar of theoretical understanding that provides an avenue for the introduction of generative AI into education is TPACK (Koehler & Mishra, 2009). TPACK represents a combination of technological knowledge, content knowledge, and pedagogical knowledge, which all form the central concept of TPACK. These two pillars are simply frameworks that enable the use of technology within education. UDL and TPACK can align with the learning theory suggested in this paper, connectivism.

Connectivism (Martiniello et al., 2021) represents a new and emerging view on teaching and learning. While some researchers suggest that is an element of constructivism (Martiniello et al., 2021), others suggest connectivism is not a part of any pre-established learning theory (Hammad et al., 2020). Connectivism suggests that knowledge is spread across multiple artefacts of information. The learners reflect through conversations and interaction and by creating meaningful digital artefacts such as blogs, webcasts (Thota, 2015) generative AI may represent a new artefact with a more interactive element. The learners now need to use technology or communication skills to gather information and implement or assess the new information in relation to their pre-established understanding. This is a more significant shift from behaviourism's stimulus and response style of teaching and learning. This paper suggests that generative AI may represent a new way in which information can be gathered. This research can be used to expand the current understanding of generative AI and the effect that this is having on teachers, exploring how teachers are adapting to and utilising generative AI to make the teaching and learning experience better for all involved.

1.2.2 AI's impact on teaching and learning

The initial point at which generative AI became of interest to the public is disputed. Vashista et al. (2023) suggest that generative AI's popularity began in 2023, while Jong (2022) counters with 2020. The early introduction of generative AI may be in question. However, the early adopters of the new software are not with Pearce (2024), noting that 30% of university students have used ChatGPT. Pearce assures that this does not lead to an increased number of students cheating but simply an increase in the number of tools that can be used to do so. As academic integrity is often the main topic of conversation around the introduction of generative AI and learning, there needs to be more exploration of generative AI as a teaching tool.

Within this study, the focus is on generative AI post-2020, with most of the literature and feedback gathered focusing on ChatGPT (OpenAI, 2024). ChatGPT is software capable of simulating a conversation and answering questions through the implementation of a Natural Language Processing (NLP) system. This allows the effective mimicry of human writing patterns. The newest version of ChatGPT allows users to create more complex output, such as images and slide decks. This study focuses on generative AI that can create content that mimics user-generated content. This includes both NLP and The Generative Adversarial Network (GAN). These two generative AI are used for text and images, respectively and represent the most well-known generative AI archetypes.

Many researchers suggest using generative AI as a tool to improve planning and administrative tasks. Lameras (2022) suggests using generative AI to create personalised teaching and learning plans, rubrics, and reading lists, learning outcomes, Qadir (2023) suggests an artificial tutoring system. This tutoring system is

not fully adaptive and is often limited to responses to basic questions on course content. It is not as adaptive as a teacher. Jong (2022) explores the willingness of teachers to adopt generative AI into their classroom, with teachers leaning towards reluctance. The research completed by Jong is limited by location, and the information gathered was in response to a workshop, not active teaching and learning experience. Roy & Putatunda (2023) focus on using generative AI as a tool for teaching English to students. When asking teachers to reflect on in-class experiences of using generative AI, they responded positively to using generative AI again.

Research has been conducted in relation to generative AI. This research is limited in location and scope. While Roy & Putatunda (2023) got feedback from teachers, the information from the teachers was limited to one experience, and the phenomena were not fully explored in-depth. This project aims to get more in-depth experiential data from teachers who are situated within FE in Ireland. Gathering actionable information, thus improving the researcher's teaching practice as a whole.

1.3 Research Origin

1.3.1 The researcher

The positionality of the researcher is an essential aspect of the teaching paradigm chosen for any research and is expanded more in the methods section of the paper. D. Holmes & Gary (2020) explains the core areas that should be noted when discussing a researcher's positionality. The researcher for this project can be summarised as an early 30 Caucasian male, not a religious insider researcher with experience in game design, development and teaching.

1.3.2 The location

The project is located at an institute of further education in the east of Ireland; the institute has been an institute of further education for many years, offering over 50 courses to students. The students who attend the institute must have completed the leaving certificate QQI level 4 or equivalent, or they can enter some courses from previous experience for older students. This results in the student cohort for classes ranging from recent school leavers to mature students up skilling to return to the workforce. Teaching methods within the college range from practical classes to theory-based classes; the teacher handbook encourages a UDL approach.

1.3.3 The participants

Participants took part in this research of their own free will and come from four main subject areas; these areas are disclosed here and not tied to any particular participant to ensure anonymity. The subjects include but are not limited to Film, Game Design, Immersive Media, Business, Marketing, Arts and Design, and Animal Science. Most teachers have a mix of subjects within these fields and have a variety of experiences to call up.

1.3.4 Researchers experience of the situation

At the start of the academic year 2023-2024, a short, continuous professional development presentation was provided on the introduction of generative AI. This presentation used generative AI to create lesson plans; these plans were lacking in substance and provided little to work with. This caused many educators to begin talking about generative AI. At that point, it became clear that there was a divide in the skill set and understanding of generative AI, with the main focus of the conversion focusing on academic integrity. The researcher began this project as one

of the teachers who believed that generative AI presented a problem and would be a tool used against us. As they delved deeper and spoke more with people who were actively using generative AI, it became clear that the focus should not be on academic integrity but on how generative AI can be used to improve our current teaching practices. How can teachers use generative AI as a tool to work for them, not against them?

1.4 Justification for Research Study

UDL has been an active framework used in teaching for some time Altowairiki (2023), with SOLAS (2020) endeavouring to improve UDL integration into education throughout Ireland in recent years. This provides a grounding for the research study to address the introduction of generative AI. UDL is well documented and is constantly being updated to include new and emerging technologies. The effect of generative AI can be seen in connection with a long-established and well-documented framework showcasing early adoption and areas of concern.

The research in the literature around generative AI is more focused on using AI as a tool for tracking students and assessing student progress in their studies (Haddad & Ashqar, 2023; Lameras, 2022). This focus on tracking students raises ethical concerns and should be explored. However, this study focuses on the adoption of generative AI as a tool for teaching and assisting with administrative tasks. The second area of focus within the literature is the use of generative AI as a tool for lesson planning and automating some minor administrative tasks, freeing up a small amount of teacher time (Vashista et al., 2023; Wong & Mahmud, 2023). This exploration needs to be fully expanded on in relation to the teacher's involvement with generative AI. This study intends to shed some light on the impact of generative AI on teaching and learning from the teacher's perspective.

The main focus of this research project is exploring the different ways in which generative AI has affected teachers and establishing possible areas of integration into the current teaching and learning approach used by the researcher. Software such as generative AI presents a new and adaptive tool for teachers and can't be limited to basic administrative tasks.

1.5 Research Methodology

The research methodology will be outlined in more detail in the methods section of this paper. This chapter will provide a short description of the research methodology used, sample group, data collection process and data evaluation process.

The interpretative phenomenological approach was employed in this research project, following the guidance within the book by Smith et al. (2022). This methodology facilitates the data collection method of semi-structured interviews. This allows for an in-depth exploration of the phenomena and how teachers are adapting to the introduction of generative AI within their teaching and practice.

The data analysis takes place following the steps outlined by Smith et al. (2022). This includes exploratory notes, in-depth notes, experiential statements, experiential themes and group experiential themes. The methodology chapter will also explore the ethical requirements for the project and how the ethics approval process took place.

1.6 Research Aim and Objectives

Thomas & Hodges (2010) explains that an essential task in any research project is to establish the core objectives or questions and outline the central goal of the project. Research aim refers to the central core goal of the project, while

objectives are sub-goals used in order to achieve the primary goal. The research aims and objectives for this project were established as part of the ethics submission and viva checkpoint process within NCI.

1.6.1 Research Aim

(1) To establish how teachers in FE are adapting to the introduction of AI into the classroom, exploring a link, if any, between UDL and AI.

1.6.2 Objectives

(1) Explore how FE teachers are using AI in education.

(2) Discuss how FE teachers view the use of AI in education.

(3) Determine if generative AI is being used to support a UDL framework.

The project aim and objective can be summarised in the following question. "How are FE teachers in Ireland adapting to the introduction of generative AI in a UDL-enhanced classroom?".

1.7 Thesis Structure

The structure of this thesis will follow the outline provided by NCI in the dissertation guidelines. The first section is the introduction, which establishes an outline of the research project and its background. The educational context of the research will be examined along with the researcher's position—a justification for the research study and accompanying research methodology. The aims and objectives of the research project will be stated.

Chapter two will explore the literature establishing core elements of concern related to the introduction of generative AI to the field of education. Three core principles will be explored, including TPACK (Koehler & Mishra, 2009), UDL(CAST,

2024), and connectivism (Mattar, 2018), all of which should be considered when introducing technology to a classroom.

Chapter three will explore the research method used in this research, following the guidance of Saunders (2009) who explains that a research approach consists of several aspects, including philosophy, approach to development, methodological choice, strategies, time horizon, techniques and procedures. This research project represents a cross-sectional study exploring a college in the early days of generative AI's public availability. Employing the interpretivism philosophy, which represents an inductive research approach where the researcher uses data to find patterns and relationships with theory. Implementing a monomethod qualitative semi-structured interview method. An exploration of the sample group, along with the process in which the data-gathering took place, exposes the limitations of the project and some of the efforts used to ensure validity.

Chapter four will explore the findings of the research, focusing on four key areas: establishing a UDL environment, generative AI and teacher preparation, generative AI as a teaching and learning tool, and CPD, and a hidden issue.

Chapter five will recap the key points exposed in the literature, reestablishing the methods used to perform the research and data analysis of this paper. Expressing how this research can affect the researcher in their current educational practices while also providing ways in which this research may add to the established theory and understanding of generative AI. Finally, suggesting the ways in which this research can help improve the implementation of CPD and areas for further research.

This chapter of the paper has highlighted the background and rationale for the research project. Expressing the need to discover more about how teachers in FE

are adapting to the introduction of generative AI within teaching and learning. Expressing the current limitations of the literature around generative AI and how this literature mainly focuses on the development of lesson plans (Vashista et al., 2023) and the limited nature of the explorations of generative AI in the classroom (Roy & Putatunda, 2023).

2. Chapter 2: Literature Review

Generative AI represents a new challenge for educators. Establishing the historical connection between education and teaching and learning frameworks can provide insight into past challenges that can serve as a source of guidance in the generative AI era. This literature review will first explore three key areas: the first is generative AI, followed by teaching and learning frameworks, including TPACK (Koehler & Mishra, 2009) and UDL (CAST, 2024). The final core concept explored is connectivism (Mattar, 2018), which provides a learning theory that encourages the use of technology and leverages digital tools to improve teaching and learning.

A short section condenses the connections between UDL (CAST, 2024), TPACK, and connectivism and discusses how AI can be used as a tool to enhance areas of the UDL core principles. This is followed by an exploration of the policies and guidelines provided at multiple levels, both internally and externally, in relation to the location of the study.

Finally, the core question driving the research for this paper is established: "How are FE teachers in Ireland adapting to the introduction of generative AI in a UDL-enhanced classroom? ". Followed by two more questions developed to gather and observe the lived experiences of teachers within the further education setting and how they are experiencing the challenge of generative AI.

2.1 Challenger AI appears

The challenge of generative AI to the world of education can not be understated, as with all new technologies, there is a limited understanding of the software and its development. This section is designed to provide educators with an overview of AI's history and the recent developments that they should be aware of.

Artificial intelligence in education is not a new phenomenon. Lameras (2022), Qadir (2023), Vashista et al. (2023), and Taneri (2020) present a multitude of AI software that has been used in education. This software includes but is not limited to Chatbots, Computer vision, predictive analytics, ChatGPT, and intelligent tutoring systems. The AI software acknowledged showcased a myriad of different purposes. Ranging from virtual learning environments (Lameras, 2022) to computer vision (Vashista et al., 2023), the integration of AI into the classroom continues to advance with new AI, such as generative AI.

John McCarthy coined "AI" at the Dartmouth Artificial Intelligence conference 1956. AI has become an umbrella term for many types of software, from Facebook to ChatGPT (Slimi & Carballido, 2023). Popenici and Kerr (2017) re-introduced a proposed solution by Alan Turing to determine when a computer program is intelligent. Popenici and Kerr simplified the concept to when people can no longer tell if they are communicating with a human or a computer. This, however, does not consider the advanced systems that have been developed since the 1950's. At its core, AI is a collection of computer algorithms with access to large amounts of data.

Baidoo-Anu and Owusu Ansah (2023) explained that there are two types of generative AI. The two models differ in their approach to accessing and generating data. The Generative Adversarial Network (GAN) is the most implemented. The GAN system works by using two neural networks. The first is the generator, which generates content. The second is the discriminator, which compares the generated content to known human-created content. The process is complete when the discriminator can no longer distinguish between human-created and AI-generated content. This result is then output to the user. Generative Pre-trained -Transformer (GPT) uses publicly available digital content. This content is processed through a

Natural Language Processing (NLP) system. The process allows the GPT system to produce human-like text. While the two systems represent two content creation methods, generative artificial intelligence (Gen AI) provides an umbrella term that encompasses both aspects of these new technologies. The induction of new technology is always accompanied by new and old challenges.

Qadir (2023) states that introducing new technologies disrupts established practices, resulting in the need to compare the possible positive and negative impacts on said practices. Baidoo-Anu and Owusu Ansah (2023) explain that there are limitations to generative AI. However, AI will continue to reshape the educational landscape. Other non-technological circumstances have caused shifts in the education landscape in recent years. The most prominent of these circumstances is the Covid-19 pandemic (Wong & Mahmud, 2023). Wong and Mahmud (2023) explained that educators moved to online learning environments during the pandemic. This provides an example of disequilibrium within the education landscape. The COVID-19 pandemic inspired innovation within the educational field. Roy & Putatunda (2023) recognized the change caused by Covid-19. Roy and Putatunda highlighted the effectiveness of educators adapting to the evolving situation and technology's role in this paradigm shift. During COVID-19, teachers and educators adjusted to online learning environments while finding and curating new digital tools to engage learners effectively in online teaching. Emerging into the public domain at the end of the COVID-19 pandemic, generative AI was set to cause more disruption to both new and old established practices.

Vashista et al. (2023) established the timeline of the current version of generative AI, suggesting that its current popularity began in early 2023. This is challenged by Jong (2022), who stated that AI's newfound popularity began in 2020.

These contrasting views could be because Jong (2022) focused on the educational lens shifting to AI in 2020, while the public domain popularity began in 2023.

As Qadir (2023) expressed, technology can cause unrest with a pre-established norm. AI presents a new challenge for educators, challenging a recently regained equilibrium. The challenge of generative AI has been acknowledged by educators and students alike. Students and educators exhibit a mixture of acceptance, hesitation, and expectation when discussing generative AI. Haddad and Ashqar (2023) explained that students have a set expectation for the use of technology within the classroom. The expectation is that new technology will be part of the learning experience. Muniasamy and Alasiry (2020) reinforced this view, expanding the students' desire for technology by introducing eLearning, suggesting that content be offered in multiple formats and on various platforms. Modifying teaching techniques, curricula, and learning environments is a must for teachers to stay relevant (Vashista et al., 2023).

2.1.1 Use of AI in the classroom

The use of generative AI in education is not limited to the classroom O'Dea & O'Dea (2023) explore student dropout prediction, automated essay scoring and information support through chatbots as ways in which higher education is implementing generative AI. O'Dea & O'Dea (2023) also align generative AI to TPACK they state that the use of generative AI in higher education is not yet viable, and few cases of its practical use have been explored. The research by Roy & Putatunda (2023) explored case studies where students engaged with ChatGPT to practice asking questions or in the generative AI. This could be considered prompt creation, in collaboration with generative AI, to create poetry. This demonstrates a mixed understanding of how generative AI is currently being implemented within the

classroom. Vashista et al. (2023) and Qadir (2023) suggest ways in which generative AI can be used to make the classroom more interactive and give students more agency within the classroom using generative AI. Neumann et al. (2023) recommends using methods such as a flipped classroom to implement generative AI fully in the classroom. The researchers who recommend the use of generative AI in the classroom (Neumann et al., 2023; Qadir, 2023; Vashista et al., 2023) provide this recommendation in the absence of practical evidence, Roy & Putatunda (2023) have provided this evidence from three individual case studies. These papers provided limited insight into the teachers' perspective of generative AI and did not provide a view of the teachers through their professional lens.

Generative AI presents a new challenge, but teaching frameworks have historically incorporated technologies; a well-known framework that encourages the use of technology is UDL.

2.2 Teaching Frameworks

New technologies in isolation can not have a positive impact on teaching and learning; they must be embedded in existing frameworks that have been proven to work. These frameworks come in many formats, with UDL being a core framework encouraged by SOLAS (SOLAS, 2021).

The use of UDL in education has become somewhat of a buzzword in recent years, first introduced by CAST (CAST, 2024) in the 1990's (Rusconi & Squillaci, 2023). Altowairiki (2023) highlights that UDL has faced challenges and that UDL is often viewed as an approach for students with disabilities. Altowairiki (2023) explains that teachers are responsible for developing their teaching practices, exposing the need for teacher training as this improves the utilisation of UDL in the classroom.

Some teacher training has incorporated UDL as an essential component. The National College of Ireland is an example of this integration.

UDL has sparked a change in the educational landscape, shifting from a one-size-fits-all to a learner-centred approach (Yuwono et al., 2023). Through UDL, students interact with multiple modes of engagement (Altowairiki, 2023; Rusconi & Squillaci, 2023; Yuwono et al., 2023). UDL encourages students to engage content in a multitude of contexts. This reinforces learner uniqueness, allowing them to draw on their experience, culture, learning preferences, and non-academic activities (Altowairiki, 2023). Students who enter into FE have a range of experiences and different views on the world. Gould (2009) explains the andragogical approach to learning, where students require more agency within their learning, Gould (2009) highlights self-concept, experience, readiness to learn, orientation to learn, motivation and the need to know as core driving factors for adult learners. This recognition of prior experience is highlighted by Gould (2009) and Altowairiki (2023) demonstrating a clear link between the andragogical approach and UDL.

Gould (2009) explains that students can accumulate mixed and rich experiences that can set the foundation for new learning. The age ranges of classes in FE can be vast, and the understanding through both UDL and andragogy is to draw on the past experiences of students. This provides a critical recurring element that allows UDL to be so effective.

UDL centres around three core pillars. Multiple papers have outlined these pillars, which are currently displayed on the CAST website (CAST, 2023).

Provide multiple means of Engagement.

Engagement centres around the concept that what learners find engaging is different from one learner to another. Providing situations where content can be

delivered in multiple formats to harness the differences in student learning. Improving the learning experience for all involved (CAST, 2023).

Provide multiple means of Representation.

Representation is related to how content is presented to learners. Some learners will present with learning differences. 7.8% of undergraduate and 2.8% of postgraduate students have disabilities within the education system in Ireland (Ahead, 2022). Providing multiple means of representation ensures that content is accessible to all students. While it is considered precautionary, multiple means of representation make content more accessible to all students (CAST, 2023).

Provide multiple means of action and expression.

Providing means of action and expression can be simplified to provide different ways for students to provide evidence of learning. This can be the opportunity to choose between providing a vocal or written report or a more complex means of expression (CAST, 2023).

It is worth noting that UDL is an iterative process and needs multiple iterations to ensure it is as effective as possible (Altowairiki, 2023). Yuwono et al. (2023) stated that UDL uses new technological developments. Teachers have used multiple media formats, including graphics, video, audio, text, images, photos, and e-books. UDL has been proven successful in higher education (Altowairiki, 2023). While encouraging learners to develop their understanding of learning (Bastoni et al., 2023). They are drawing out the experiences that learners have from their lived experiences (Altowairiki, 2023). CAST has developed a framework where education and technology can work in harmony. As UDL represents an iterative process through which the introduction of new and emerging technologies is possible, generative AI could be the next leap in improving this framework. While UDL

represents a framework that is currently well known, multiple theories and frameworks have come before. Bates (2019) outlines many teaching theories in their book. One theory that could provide some insight into theory development is Gardner's theory of multiple intelligences. Bates (2019) describes this as providing students with content or tasks that are aligned with their learning preferences, including linguistic, logical-mathematical, musical, bodily-kinesthetic, visual-spatial, and interpersonal. Intrapersonal, naturalistic, and existential. While there may be no historical link between these two theories, Gardner's theories appear to be in alignment with multiple modes of expression and representation. The use of Gardner's theory of multiple intelligences and UDL both require reflection on the current practice by the educator.

Mohamed et al. (2022) assert that reflective practice is known as an important element of continuous professional development for teachers. Mohamed et al. explain that the practice of reflection needs to take on a problem-focused approach as this allows the educator to address the issues that arise. Upon reflection of these problems, action should be taken. Mohamed et al. (2022) exploration of reflective teaching practices and the iterative nature of UDL, as highlighted by Altowairiki (2023) highlights the needs for the teacher to be an active member within the UDL framework. These frameworks do not work in isolation and need to be used in parallel with established learning theory.

2.2.1 Learning Theory

Pedagogies represent active teaching and learning practices grounded in learning theory, such as constructivism. Learning theories have connections to empiricism and rationalism (Ertmer & Newby, 2013). Three foundational learning theories should be considered when discussing technology.

The first learning theory is behaviourism, representing early educators' first significant learning theories. It was established in 1919 by John B. Watson and popularised by Ivan Pavlov (Gould, 2009). In its simplest form, a student should be shown a flash card (stimulus), and the answer is a learned response. Think back to memorising your timetables in the '90s. This is a learned behaviour and response (Ertmer & Newby, 2013). This process does not focus on or consider student knowledge formation and considers learning a response to an outward stimulus. Following behaviourism, scholars began to explore what it truly means to know, resulting in advancements in learning theory.

Constructivism is an umbrella term encompassing several theories. Mattar (2018) states that constructivism includes situated cognition, activity theory, experiential learning, anchored instruction, authentic learning, and connectivism. The inclusion of connectivism in constructivism has been contested. Hammad et al. (2020) challenge the connection of connectivism to behaviourism, cognitivism, or constructivism, stating that connectivism does not add to the principles of these theories or expand on how people learn. Mattar (2018) describes the situation of knowledge distribution in the digital age. Learning is no longer an individual's ability to recall information. It now includes using multiple artefacts of knowledge distributed across people, experience, and technology to solve a situation, complete a task, or perform an action. This allows the learner to focus on implementing the theory more effectively and challenges the historical method of stimulus and response.

The connectivism approach to knowledge allows learners to gather and implement the theory in a setting that better suits them, reinforcing the UDL pillar of multiple means of action and expression. The essence of knowledge is distributed across various information nodes, strengthening the pillar of multiple means of

engagement and empowering learners to engage in content in a preferred format. While the pillar of multiple means of representation is more focused on content curation and ensuring that the content provided is suitable for all students, it has been and remains a focus for the teacher or educator. Accessing this knowledge may not always be an obvious process for the students. As such, scaffolding may provide more guidance to access both the knowledge and improve understanding.

Zhou et al. (2023) explain that scaffolding was first coined in 1976 by Wood et al. Wood et al. (1976) describes the development of scaffolding building on the work of co-author Jerome Burner, expanding on the theory outlining the expert-learner relationship where the expert provides support for elements which the learner is not yet able to complete. Scaffolding can be categorised into four main categories conceptual, metacognitive, strategic and procedural (Zhou et al., 2023). Chen & Law (2016) outline the difference between hard and soft scaffolding, Chen & Law describe the effects of hard and soft scaffolding. Their findings suggest that a mix of hard and soft scaffolding provides the benefits of both types and mitigates the negatives. Chen & Law (2016) describes hard scaffolding methods as question prompts, while soft scaffolding can include collaboration opportunities, allowing students to provide and receive explanations, co-construct ideas, and resolve conflicts and negotiations. Belland (2017) explains the importance of scaffolding, stating that this is support provided to students that can be provided by teachers, peers, or computer tools. The use of computer tools here may extend to the introduction of generative AI software. Belland (2017) continues to suggest that scaffolding can be used to assist students in designing content, solving or evaluating a problem and completing projects. When discussing scaffolding and dynamic assessment, Belland (2017) describes how the teacher can evaluate the student's

current level of understanding, draw the student's awareness of concepts in the tasks, and assess the student's ability to conduct the core task. Belland highlights that this can be done in collaboration with others. One way in which a teacher may help scaffold an assessment or class activity for a learner is through the introduction of technology once done so with consideration for a valid teaching framework.

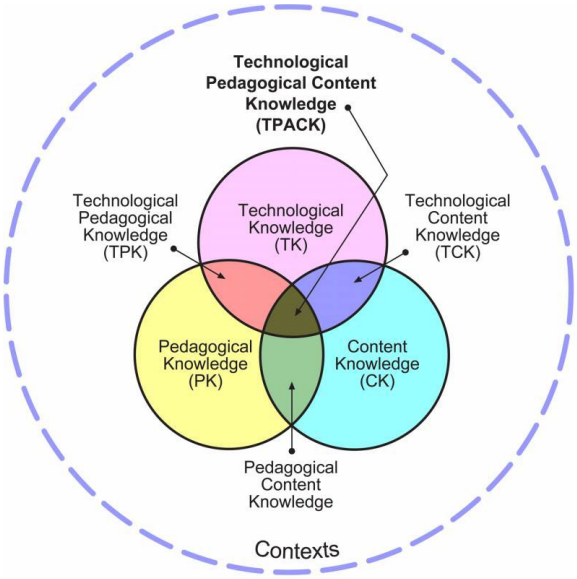
2.3 Considerations for introducing new technologies

Learning theory and the UDL framework represent only two areas, both focused and grounded in theory. A final element should be considered when introducing new technology into the classroom. The element of practice should be considered. The introduction of TEL and ICT in education has proven benefits, enabling students who may otherwise not be able to engage in class content to participate (Gravells, 2017, p. 322). Gravells (2017, p. 319) explains that TEL and ICT invoke many online resources and media to improve teaching and learning. Teachers must select valid software while using online material. McMahon and Walker (2019) recommend adopting the least dangerous assumption method when considering what classroom software or technology to use. They expand on this concept and explain that educators must use their best judgment when considering new technology. This, however, is not a sure-fire guarantee of success. As established by McMahon and Walker (2019), educators need to gain more knowledge of the multitude of software available on the market. Efforts need to be made by the teacher to improve the teacher's working knowledge of available software. Current literature has explored possible guidance in this area of confusion. One long-established framework that may work with generative AI and new advancements is TPACK.

TPACK, also known as Technological Pedagogical Content Knowledge, is a focused area of study that evaluates the connections between teaching, learning, pedagogical approach, and technology.

Number: Figure 1

Title: TPACK diagram



Note: Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? Contemporary Issues in Technology and Teacher Education (Vol. 9, Issue 1). http://www.tpck.org/.

Figure 1 depicts a Ven diagram outlining the intersections of the core principles found within TPACK (Koehler & Mishra, 2009), showcasing the importance of technological, pedagogical and content knowledge. In the case of TPACK, generative AI could represent a tool used in technological knowledge and a new mode of delivery for content knowledge. AI can be firmly placed in the centre of Figure 1's diagram. It is essential to note the interrelationship of all areas of the diagram. A single circle represents a different element of TPACK, such as Pedagogical knowledge (PK), Content Knowledge (CK) and technological knowledge (TK). The overlap between these areas represents a more in-depth understanding,

with the centre representing TPACKs full benefit. Further education teachers should be aware of all three sections, PK, CK, and TK, with the goal of combining all of them in a meaningful way in order to utilise emerging and existing technology within teaching and learning.

The use of TPACK as a primary contributing factor for generative AI introduction has been challenged in the past. In a similar study, Song et al. (2024) considered the five big ideas a more appropriate framework for generative AI amalgamation. In their paper, Song et al. acknowledged that TPACK was comparable to the five big ideas and appeared just as prominently in existing literature. This study aims to understand the current situation of generative AI amalgamation among further education teachers. Song et al.'s (2024) research was based heavily on literature. This study aims to take a more direct approach and involve active teachers. This aim is backed up by many scholars requesting more information to be gathered in this area (Moya & Eaton, 2023; Song et al., 2024).

This section of the literature review has evaluated the core principles that should be considered when involving a new technology within teaching and learning. McMahon & Walker's (2019) statement that teachers should focus on doing the least harm, combined with TPACK (Koehler & Mishra, 2009) framework for choosing and implementing technology as part of the teaching and learning process embedded with the UDL framework all align together to create a system where technology, teaching, and learning can work in harmony.

Exploring the use of frameworks that provide a grounding for the use of AI leaves one question that this dissertation aims to explore: How are FE teachers in Ireland adapting to the introduction of generative AI in a UDL-enhanced classroom?". The implementation of technology within the classroom as part of these frameworks

also needs to consider the level at which the module is being delivered. Multiple guidelines and methods can be utilised to facilitate student learning.

2.3.1 Counter to AI

For a potential answer to this, Bloom's level of cognitive domain may provide a level of guidance. Bates (2019) describes Bloom's taxonomy as having six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. Each level represents a higher order of understanding and, thus, a deeper understanding of theory.

Bloom's taxonomy may provide an extra benefit that may not be initially apparent. This is highlighted by Elsayed (2023), who conducted a study framing questions using Bloom's taxonomy as a base and then entered these questions into generative AI software. The use of Bloom's taxonomy reduced usable and creditable responses from the AI software. Influencing the effectiveness of the AI's response depends on the question and chosen words used within Bloom's taxonomy. This links Bloom's taxonomy and the AI response quality. Elsayed (2023) recommends more training in creating questions and assessments with Bloom's taxonomy. This shows the importance of well-established learning theory. Assessment creation can be a topic that some teachers find difficult. When considering the level at which the assessment is set, it is important to have a guiding framework. As such, throughout the many levels of education, Bloom's taxonomy is often used when considering MIMLOs and, as a result, in assessment design. Bates (2019) suggests the classroom use of blooms in the following format: align the tasks to the level at which you are teaching, ensure that the teaching method aligns with the MIMLO, and ensure that the task is set at the level of student understanding. In the world of generative AI, this is more important than ever, as unveiled by Elsayed (2023).

Generative AI's alignment with Bloom's taxonomy can reduce the effectiveness of AI in generating responses to assessment questions. While the foundations of how one might add technology into the classroom are well established, generative AI is a new technology that emerged from AI and has a historical development of its own.

2.4 Documented concerns

As with any new and emerging technologies, there are concerns about using generative AI in education. As stated by W. Holmes et al. (2022) the use of AI as a method for teaching employs a naive approach to teaching and learning. W. Holmes et al. (2022) explain that the use of AI is often pre-detriment and guides the learners towards a fixed goal of what learning looks like, not allowing them to make their journey. This is a concern as the use of AI in this format links back to behaviourism, ignoring years of development within pedagogical approaches (W. Holmes et al., 2022). W. Holmes et al. (2022) highlight the many possible false claims that AI brings to education and explain that AI has been marketed as a way to personalise education. However, the method of doing so is limited and unsuccessful. Concerns are not limited to false promises of customised learning.

One of the most prominent concerns centres around plagiarism detectors. Neumann et al. (2023) state that plagiarism detection tools are only 66% effective, while human readers are 67% effective at detecting AI-generated work. While the detection rate is less than optimal, Neumann et al. pointed out that ChatGPT has a unique output or fingerprint that can be easily identified. This unique fingerprint is perhaps the first concern academics should have when discussing ChatGPT. ChatGPT is not an academic software. Hinman (2023) explained that ChatGPT can fabricate information. When asked to provide references for academic-based questions, ChatGPT provided a list of website links, but all links were fake. This

results in issues regarding the ethical use of AI in terms of academic integrity. The ability for a person to distinguish between AI-generated content and human-generated content is explored more by Fleckenstein et al. (2024) who discovers that teachers are more confident in their ability to detect AI-generated content than their actual ability to do so. This may represent an inherent bias of teachers as a group whose hubris may be a limiting factor. There may be tell-tale signs of generative AI use, but if teachers are not aware of their own bias toward the content, they may fall foul of it.

Ethical guidance is paramount when considering plagiarism within the academic community. However, other areas of suggested AI integration require a more in-depth evaluation. While this study is focused on how teachers are adapting to using AI. It would be remiss not to highlight the possible application suggested by many research papers and express the need for ethical considerations. Lan & Chen (2024) highlight teachers' concerns that students will use AI for homework, the difficulty in discerning student vs. generated AI content, and the lack of understanding of how generative AI can be used as a teaching tool. Lan & Chen (2024) explore the issues related to student use of AI as follows: using generative AI as a search engine, excessive reliance on generation AI for completing learning tasks, and lack of understanding of using AI as a feedback system. Lan & Chen (2024) employ the use of cleaver prompts in order to use generative AI to facilitate learning through curated interactive sessions led by a teacher.

Many papers suggest and provide insight into AI use as an academic tracking software. Lameras (2022) indicates that AIED's true offering to improving education would be analysing student learning and providing possible solutions to learning problems. Haddad & Ashqar (2023) posit that tracking students' facial expressions to

establish how engaged in learning they are, providing teacher feedback on students' assignment answers, and automatically providing students with extra resources based on their work and learning preferences would represent good AI integration in education. Sayed Al Mnhrawi and Alreshidi (2023) recommend analysing students' cognitive behavior. Slimi & Carballido (2023) state that AI's ability to predict students at risk of failing and data mining is improved over traditional methods and should be considered. These uses of AI in isolation appear to showcase possible benefits. It is paramount that the ethics of tracking students and their data in a software environment that may not be fully isolated to the educational institution or governing body be fully considered. At a minimum, the GDPR ramifications should be considered. As stated, this is not the focus of this paper. However, this remains an issue and should be analysed by another researcher in more depth.

2.5 Generative AI, UDL, TPACK and Connectivism.

The literature to this point has explored concepts in isolation, establishing the historical implementations of each theory of UDL (CAST, 2024), TPACK (Koehler & Mishra, 2009) and Connectivism (Mattar, 2018). Connectivism established that information is distributed across multiple artefacts. (Mattar, 2018). This distributed information can be presented in digital and traditional sources. Generative AI represents a digital source of information. It is the teacher's knowledge of technology (TK), content knowledge (CK) and Pedagogical knowledge (PK) that informs the guidance they give students on which artefact they engage with that may best assist the student. A teacher without a solid technological knowledge foundation may not suggest software or generative AI that would be of benefit. Strong knowledge of where to find information connectivity and what software and methods to use TPACK

underpin the introduction of generative AI. However, these alone do not provide the full range of understanding when introducing new content to a class group.

UDL is the final element needed to tie these elements together; at its core, ULD focuses on the needs of the learner. Altowairiki (2023) brings to light the need for technology in UDL, exploring the historical use of technology within UDL. UDL is not without its challenges. UDL moves away from a one-size-fits-all approach to teaching and learning. Focusing on the way in which different learners engage with content and reproduce their understanding for assessment. This can be a challenge for first-time teachers, implementing a multimodal approach for multiple learners, AI, according to Vashista et al. (2023) can be used to create lesson plans for individual learners that could elevate this stress for first-time teachers. Altowairiki (2023) describes a lack of UDL understanding as a limiting factor in UDL implementation. Generative AI may provide feedback to teachers based on situational information to guide teachers, as suggested by Pearce (2024) where AI can provide feedback to teachers, allowing them to update the teaching content. All these elements are important and contribute to the understanding of the whole situation at play when it comes to the introduction of generative AI.

Number: Figure 2

Name: Possible Benefits of AI in connection with UDL

Engagement	Representation	Action and Expression
Students can use AI as a collaborative agent (Pearce, 2024) (Slime and Carballo, 2023)	AI can be used as a scaffolding tool (Pearce, 2024)	AI can be used as an assistive technology to assist students (CAST, 2024)
AI can be used to present information in multiple ways, making it more accessible (Baidoo-Anu and Ansah, 2023)	AI can be used to encourage and build understanding (Taneri, 2020)	
AI can be used as a learning assistant (Moya and Eation, 2023)	AI can customize content to learner needs. (Muniasamy and Alasiry, 2020)	

In a purely theoretical setting, this literature review would provide a solid understanding of the situation and the crucial theories to this point. However, educational practice takes place in an educational setting with governing bodies that have their own rules and regulations in regard to technology and teaching methods. The policies can come from multiple levels in further education settings within Ireland; SOALS, QQI, EU regulations and international policies all play a part in the introduction of new tools and, as such, should be explored.

2.6 Polices explored.

The ethical impact of AI has not yet been thoroughly evaluated, as the technology is constantly developing, and not all eventualities can be considered. Several researchers have assessed the current policies regarding AI. Nguyen et al. (2023) evaluated multiple regulations designed to address the impact of AI in education. Nguyen et al.'s exploration is limited to a policy analysis of several governmental institutions, each representing a different global body. This analysis revealed seven principles that expose a commonality among all international bodies. Governance and stewardship, transparency and accountability, Sustainability and

proportionality, privacy, security and safety, inclusiveness, and human-centred AIED are the principles established (Nguyen et al., 2023).

Students and teachers alike have concerns when considering AIED. Some ethical concerns are highlighted by W. Holmes et al. (2023) whose research establishes a baseline that can be used for comparison. W. Holmes et al. (2023)conducted a study with teachers and students, revealing student concerns related to the use of student data with AI, the impact that AI can have on the socio-economic background of students and or the perception of such, and the impact that AI may have on academic standards. Teachers' focus appeared to be related to student data and the need for training in AI tools. However, they seemed hopeful of AI's benefits in automating “boring” tasks (W. Holmes et al., 2023). Vashista et al. (2023) confirm the teacher's desire for training in the field of AI, suggesting that this training should be considered part of their professional development. QQI (2020) states that professional development in technology is the responsibility of each educator. This highlights the need for training in the area of AI, focusing on the concerns of the students, such as data protection, while also providing improvements for teachers by informing them how to use AI as a tool to assist with administrative tasks.

Training has increased teacher preparedness and job satisfaction (Bastoni et al., 2023). Teacher training is part of many educators' journeys, including those who wish to teach in further education in Ireland. Institutions such as the National College of Ireland provide training courses with modules focusing on diversity and inclusion and teaching methods expressing the importance of UDL. Rusconi and Squillaci (2023) state that completing a course in UDL increases a teacher's ability to put the framework into practice. The desire for training in AI expressed by Vashista et al.

(2023) and the research performed by W. Holmes et al. (2023) reinforce the teacher's willingness for training, which suggests an opportunity to empower teachers to use AI. Compounded by Bastoni et al. (2023) suggestion that training improves teacher satisfaction along with Rusconi & Squillaci's (2023) claims that UDL training empowers teachers to implement UDL meaningfully in the classroom. AI training may become as impactful as UDL training for education.

The question now becomes what principles teachers are responsible for or if they have considered these principles established by Nguyen et al. (2023). Addressing ethical implications in isolation does not view the whole picture W. Holmes et al. (2023). Consideration must also be given to the moral impact on teaching itself. Pedagogy, the teacher/student relationship, diversity, equity, inclusion, and validity are all areas that must be considered when evaluating the ethical implications of AI and teaching.

QQI (2023) guides educators in Ireland. This guidance is limited compared to the abovementioned principles by Nguyen et al. (2023). QQI (2023) suggests that educators should be aware of ethical considerations related to AI and the limited access some people may have to the technology. QQI continues to recommend testing and evaluating AI in context-specific situations and enforces the need to ensure academic integrity. The final guideline for educators is to follow the local guidelines provided at an institutional level. This sets the lion's share of the responsibility on the educator and their interpretation of the guidelines. While some guidance elements are provided, there are contrasting views on who should establish these policies and how far-reaching they should be.

Lameras (2022) recommends creating guidelines for what AI teachers can use in an educational setting. While developing guidelines, Lameras (2022)

recommends focusing on specific instances of teaching and learning. Vashista et al. (2023) reaffirm Lameras's (2022) suggestion but expand the concept by suggesting that the administration create guidance on generative AI that should be more wide-ranging. Vashista et al. (2023) advocate for macro governance in contrast to Lameras' micro guidelines suggestion. Slimi and Carballido (2023) stated that regulations must be established to ensure the ethical use of AI. Within this context, regulations should be more stringent than guidelines.

QQI (2023) assigns teachers and institutions the responsibility of establishing rules. The contrasting views on micro vs. macro guidelines and the call for more stringent regulations indicate that the area where reliable guidelines can be generated has yet to be fully established. The views of active teachers in further education may provide more insight into what type of guidance would benefit the everyday professional.

As the study will take place in an FE college in the east of Ireland, exploring public-facing policy documents on the use of AI is essential. The institute's AI policy can be found on the college website. Located in the student dropdown menu, this may suggest that the AI policy is limited to the use of AI by students. The website outlines guidelines for student AI use within the institute. This guidance clearly states that the guidelines were gathered and created with heavy influence from "Generative AI: Guidelines for Educators." published by QQI (2023). Two critical sections of the guidance provided to students by the college recommend that students seek advice from teachers on the use of Generative AI, compounding this need by reinforcing that students' work is credited for work they as a student completes, not work obtained from programs that employ the use of generative AI. All students are required to sign an authorship statement when they submit work, and the guidance

highlights that one section of the authorship statement has a section related to submitting generative AI work as one's own and that falsely claiming AI work as one's own can have repercussions. Policies within institutions are not limited to the use of AI. The policies that the college follows are not limited to QQI's AI guidelines. SOLAS guidelines and goals represent another governing body that influences the area.

SOLAS (2020) released a national further education and training strategy stating a shift to a UDL approach to teaching and learning. This UDL approach is recommended to ensure consistent learner support and apply good and inclusive practices across all areas. (SOLAS, 2021) provided guidelines for further education and training within Ireland on implementing UDL. Firstly, expressing the uniqueness of FET learners, a core tenant of UDL SOLAS, quickly aligns FET and UDL paradigms. Throughout this document, SOLAS explores the pillars of UDL and how they can be reinforced. These pillars are explored in the UDL section of the literature review. The college's teacher handbook has a short section highlighting the commitment to a UDL approach within the institution. This places the college in a situation where both UDL and AI guidelines are provided to staff from the governmental and local levels. This offers the opportunity to gain insight into the problem and generate a snapshot of the overlap between AI and UDL at this early stage in generative AI's development.

First established in Dartmouth in 1951 (Slimi & Carballido, 2023), AI has advanced and developed in many directions and is present in many applications. The effects of AI are far-reaching and have touched many aspects of our lives; education is by far no exception. Educators first faced a forced movement to e-learning (Wong & Mahmud, 2023), followed by a swift change in generative AI

accessible to teachers and students. Baidoo-Anu & Owusu Ansah (2023) explain that generative AI comes in two categories: generative adversarial network or natural language processing. While introducing new technology can cause unrest within established paradigms (Qadir, 2023), evaluating AI's positive and negative effects on teachers and students alike is necessary. The effectiveness of AI has yet to be thoroughly evaluated, as Neumann et al. (2023) state that plagiarism detection tools are only 66% effective when attempting to detect AI-generated content. However, this may be mitigated by Hinman (2023), who proved that chart GPT's ability to provide a valid bibliography is almost nonexistent. With this new introduction of AI that can generate content almost indistinguishable from that created by humans, it is paramount to consider the ethical ramifications of such software concerning education.

There have been many suggested uses of AI in the classroom. However, many of these suggested uses focus on classroom management and student monitoring: the results (Lameras, 2022), engagement, or recording an analysis of student facial expression (Haddad & Ashqar, 2023). AI policies have been explored and evaluated on their content related to teacher engagement with AI. From this analysis within the context of Ireland, most of the responsibility appears to be placed on the educator. These policies emphasize the need to ensure academic integrity; however, they provide little to no context on how this can be done in an AI-empowered world and encourage teachers to explore and evaluate AI relevant to their field of study (QQI, 2023). AI-empowered learning cannot stand alone and must be placed within a framework that has been established and can work well with this new technology.

One such framework that may be used is the universal design for learning framework or UDL (CAST, 2024). UDL has historically used new technologies to empower learners, encouraging them to engage with content in new and meaningful ways to leverage their uniqueness as learners, validating and empowering their past experiences. UDL is not a pedagogy of teaching and learning. Learning theories have been explored, and their connection to connectivism. Connectivism represents a point where technology-enhanced learning can be fully realized. This means that knowledge is no longer singular to the person but spreads across multiple information artifacts (Mattar, 2018). Gathering information no longer requires instant recall from a single person; learning, in this case, is no longer stimulus and response behavior but the ability to navigate information nodes to achieve the end goal.

Finally, this chapter explored the known use of AI in classrooms. This mainly focused on teacher preparation (Muniasamy & Alasiry, 2020) with limited application in the classroom as a teaching method (Roy & Putatunda, 2023). However, researchers have speculated on the possible benefits of AI as an enhancement to teaching within the classroom (Qadir, 2023). It is important to note that for this research, the focus on AI is on teachers and students facing AI. At the same time, institutions facing AI represent a massive area of research. That should be researched in another study dedicated to the impact of such high-level AI on an educational institution.

2.7 Emerging questions

This literature review has evaluated the historical context of AI, the different types of generative AI available, how teachers are currently using AI, the policies related to educators on the acceptable use of AI, and finally highlighted some ethical concerns and considerations required for the use of AI in teaching and learning. At

this point, it is clear to see how the overarching question of "How are FE teachers in Ireland adapting to the introduction of generative AI in a UDL-enhanced classroom?". It can provide the context for the current situation concerning AI and add to the discussion on the effective use of AI in the classroom.

Two sub-questions have been established based on the literature to answer this question. The first sub-question clarifies the differing views of teachers presented by Roy and Putatunda (2023) and Jong (2022). As such, the first sub-question:

"How do FE teachers in Ireland view the introduction of generative AI in a UDL-enhanced classroom?".

The second question focuses on meaningfully implementing AI in the classroom, focusing on a UDL framework. The question emerges:

"How are teachers using AI in a UDL-empowered classroom?

3. Chapter 3: Methodologies

This chapter of the paper will explore the research philosophy held by the researcher, establish their worldview, and explore the ontology, axiology, and epistemology related to the research approach chosen. As highlighted by Saunders (2009) three aspects of a research project influence the approach chosen. These aspects account for much of the discussion in this chapter. A short exploration of the researcher's unique background in teaching and games development can provide an understanding of the lens through which the researcher will evaluate and perform the research for this project.

After establishing the research methodology that was be chosen, an exploration of the sample group, how this group was contacted, and the criteria for being a member of this group will be explored, followed by a short biography of each member of the group. A description of the actions that the participants took in order to take part in the project. Followed by an acknowledgement of the process used to implement the research methodology chosen.

Including the ethical approval process within NCI in preparation for the interview question creation, pilot interviews, and the manner in which the interviews took place. The process outlined by Smith et al. (2022) will be explored when evaluating the transcripts from stage 1 to stage 7, as outlined in their book. This chapter will conclude by considering how to ensure research quality was approached, including reflexive journaling and member checking. This IPA study was guided by the following research question "How are FE teachers in Ireland adapting to the introduction of generative AI in a UDL-enhanced classroom?"

3.1 Research Philosophy

The research for this project took the form of an interpretive phenomenology approach (IPA). IPA represents a research method in which the lived experience of the participants can be explored in depth. Aiming to expose the true impact that the introduction of generative AI has on teachers within FE.

The IPA approach is outlined in detail with a step-by-step process by Smith et al. (2022). In the step-by-step process of the approach, seven key steps can be followed. This approach was chosen after much deliberation and reflection on the three main factors highlighted by Saunders (2009) that contributed to the choice of a research approach. These include (1) worldview, designs, and research methods, (2) the experience of the researcher, and (3) the discipline in which the research takes place. A short explanation of the researcher's experience will be exposed in this chapter to highlight their viewpoint in making these choices.

IPA is a research methodology with a long history. IPA is a phenomenology approach to research focusing on the experience of the research participants. IPA consists of three main concepts: (1) phenomenology, (2) Hermeneutics and (3) Ideography (Smith et al., 2022). Researchers and philosophers such as Husserl, Heidegger, Merleau-Ponty, and Sartre have contributed to the development of this research method in relation to phenomenology, focusing on how someone experiences something. Each brings new insight into the approach (Smith et al., 2022). Smith et al. (2022) explains that three primary principles, Schleiermacher, Heidegger and Gadamer, all played a part in developing hermeneutics; Hermeneutics relates to the interpretation and how something is interpreted. Developed from this is the concept that something can have two meanings: a visible meaning and a hidden meaning. This research of this study is a critical part of

choosing this method as it allows the researcher to look deeper than maybe even the participant intended. The final essential element of IPA is ideography. This relates to encouraging a focused approach to a specific situation or phenomenon.

3.2 Ontology and Epistemology

This project falls into the more focused approach to gathering new knowledge. Ontology is related to the assumption about reality or how a person views and interprets reality (Saunders, 2009). Saunders (2009) explains that epistemology relates to the assumptions about knowledge and what is valid knowledge and what is not, and finally, axiology is concerned with ethics and values within the research approach. This research project represents a cross-sectional study exploring a college of further education in the early days of generative AI's public availability.

Smith et al. (2022, p. 1) explains that the IPA researcher could be engaged with a double hermeneutic as the researcher tries to interpret the participant's interpretation through the researcher's own interpretation of the participant's responses. This demonstrates multiple possible conflicting realities of the situation. Phenomenology focuses on what it is to be human, providing methods to explore and understand lived experience (Smith et al., 2022, p. 7). This means that reality is interpreted by the person who has the experience, thus establishing the Ontology of the IPA approach. At the same time, the double hermeneutic view of this research paradigm provides a clear grounding for the epistemology found within IPA, where realities need to be interpreted. This interpretation of others' realities is also present in UDL.

Altowairiki (2023) describes UDL implementation as an iterative process. This process shows the critical reflective nature of the UDL from the teacher's perspective. This reflection can be explored in more depth in relation to the

introduction of AI. Stated by Galkienė & Monkevičienėė (2021) UDL as a framework began in the 1990s, and while first implemented in the USA, it has quickly gained traction in Europe. Through this time there have been multiple iterations of UDL implementation, in which the teacher must engage in critical reflection (Noffke & Brennan, 2005) in order to gain a better interpretation of the student's reality. The choice of IPA as a research method leverages this pre-established reflection that teachers are already engaged in allowing for deeper insight into their true realities.

Interpretivism represents a complex worldview where reality is socially constructed and viewed by many observers. The perception and interpretation of individual realities can expose rich knowledge interpreted through the researcher's understanding of the participant's reality. Saunders (2009) states that the interpretivism paradigm often uses a small sample size and in-depth investigations through qualitative methods. This is reinforced by Smith et al. (2022) who suggests multiple interview methods and provides an outline of how to conduct these interviews. Following the guidelines proposed by Smith et al. (2022) the participants that could participate in the research were established through the criteria listed, which is expanded on in the sample group subsection of this chapter.

3.3 Positionality

D. Holmes & Gary (2020) suggests that an excellent positional statement should include the following information: researchers' lenses, potential influences, the researcher's chosen position regarding participants, the study content, and how, and when this might influence the research process. The researcher is in their 30's, Caucasian male, and not religious. The researcher is an active teacher within the college where the participants also work. An insider researcher D. Holmes & Gary (2020) warns that an insider researcher can be seen as positive and negative, with

some suggesting that it can allow the researcher to see past the colloquial language used and allow the researcher to evaluate the authentic voice of the research participants. This does not remove the need to be aware of preferences or biases that are present within insider research.

The researcher comes from a game design and teacher background that focuses on player agency and individual experiences as part of a whole. The researcher is also a recent addition to the AI focus group within the institution and is actively engaged in technology and experience design-focused subjects. As such, the researchers would describe themselves as digital native (Prensky, 2001). It should also be noted at this point that the researcher has dyslexia. The note of dyslexia is for two main reasons. The first is representation in academic work, and the second is the core way in which the researcher interacts with the written word, which is different from others. Make by Dyslexia (2018) highlight the ways in which dyslexic individuals may interact and process the world around then in different ways. Make by Dyslexia, explain that dyslexia is described as a difference in thinking in which dyslexic individuals work differently. The use of IPA has affected the participant choice for this paper through two core aspects. The choice of participants was made to get as many views of the same phenomenon as possible, focusing on different disciplines that have varying levels of interaction with new and emerging software. Each person's experience is inherently different through their active daily lived experience.

3.4 Sample group

The sample group for this experiment was purposively selected. A purposively selected sample group is chosen by the researcher and requires a level of judgment on the researcher's side (Lærd Dissertation, 2024). The sample participants are

chosen to ensure that all participants have similar traits in terms of occupation. This is considered expert sampling (Lærd Dissertation, 2024). Smith et al. (2022) suggest a sample size of 5 for a master's research project. Smith et al. (2022) highlight that in an IPA study, the sample group should be one that can provide access to a perspective on the specific phenomena. In this case, those would be active teachers within FE and an environment where AI may be present.

Due to the short time that AI has been an active topic of discussion, as highlighted by Jong (2022) and Taneri (2020), With generative AI, the condition of over two years of experience has been added to ensure active engagement with teaching during the rise of AI. The final condition is that they must be a registered teacher by the Teaching Council of Ireland. This is a requirement to teach in Ireland and, as such, is considered an essential requirement.

Due to the focus of this research project centring around teachers in further education use of AI in connection with UDL, the following criteria were established:

(1) Be an educator who is actively involved in teaching in further education.

(2) Over two years of experience teaching in further education.

(3) Be actively fully registered with the Teaching Council of Ireland.

These criteria can be easily conformed to in multiple ways. All participants work within the same college of further education, completing criteria 1 and 3, as these are requirements for working as educators in this institution. The number of active years in teaching was established for each individual based on their Teaching Council registration. As the criteria for Teaching Council registration has changed over the years, these are estimates of their numbers and may not truly reflect their total teaching experience.

All participants were given false names from a well-known game in the Final Fantasy series. Below is a short description of each participant; however, precise details, such as subjects, are not presented here to ensure anonymity.

Pseudonym	Background of Participant
Cid (Pilot interview):	Cid participated in the interview process as the pilot and assisted with solving and clearing up any issues with questions and delivery. While not part of the data analysis for this project, they provided much-needed assistance.
Vincent:	Vincent teaches many practical classes using hardware and software and has over 15 years of teaching experience. Demonstrable skills in many digital fields and digital techniques. They have strong digital skills, knowledge and adaptability.
Elena:	Over 15 years of experience in practical, hands-on subjects. Strong knowledge of teaching and learning theory. Self identifies as not tech savvy.
Cissnei:	With over ten years of experience, Cissnei has a strong foundation in what could be considered more traditional research methods, focusing on scientific rigour and case studies.
Reeve:	3+ years of experience with a strong understanding of technology and its implementation within core subjects.
Don:	10+ years of experience. Deep knowledge of subject-specific software and theory, focusing on practical and

	repeatable class tasks and methods in classes, with a love for traditional techniques and effects.

Participants were selected due to their diverse understanding and interactions with technology and subject matter to gain a more holistic understanding of the situation within the institution. Participants were first contacted via e-mail from the student e-mail address provided by NCI. If they expressed a desire to participate in the study, they were provided with two documents: (1) the plain language statement (appendix 1) and (2) the consent form (appendix 2). In total, seven possible participants were contacted, six completed consent forms, and five took part in the interview process. This excludes Cid. The potential participant who did not participate in the study failed to attend the interview and was provided another opportunity to participate but declined.

All participants were provided with a set of dates that they could choose between for the interview to take place online. This was done on a first-come, first-serve basis.

3.5 Research Methods.

The research methods chosen for this project under the supervision of NCI require adherence to eight fundamental principles. These are outlined as follows, along with how the researcher intends to adhere to these principles.

Democratic values: All participants will be treated with respect during the process and after that, regardless of diversity or differing needs.

Justice and equality: A holistic approach to research with regard to literature and participants will be adhered to throughout the process, providing an equal and just foundation for this project.

The child, the family, and society: There are no limiting factors within this study that exclude participants by any discriminatory factors; only the required qualifications and relevance in job experience are listed in the sample group sub-section.

Integrity, transparency, and respectful interactions: All anonymised data gathered will be provided for evaluation, along with the research journal, which can provide an audit trail for the study.

Knowing from multiple perspectives: Multiple participants with multiple views and levels of influence within the institution provide their views.

Quality and rigour: The quality and rigour of this study will be enhanced by the use of a research journal that provides an audit trail of participant participation and validation of anonymised data for evaluation.

Academic scholarship: All sources of information will be acknowledged, including outside sources of assistance, and any other guidance provided while conducting this study will be acknowledged.

The social contribution: The lasting effects of this study are to improve the current understanding of AI and education and provide a better foundation to improve pedagogical approaches in a technology-enhanced world.

3.6 Preparation for interviews

3.6.1 Initial preparation

Preparation for the interview process took several steps. The first step in the preparation contributed to the literature review of this paper, with much of the literature informing the generation of the questions. Generative AI represents a new and evolving technology with many avenues of exploration. This paper focuses on

how teachers adapt to the introduction of Gen AI or how they do not. Smith et al. (2022) state that the questions do not need to be directly connected to the literature and can address a gap. To this end, the literature was explored in detail. Many areas of the literature address how teachers use technology to aid in everyday planning or how they are using AI to alleviate the administrative tasks of the teacher. Some papers explore using AI as a teaching tool, such as the study completed by Roy & Putatunda (2023) from this, the first core question emerged: "Can you walk me through an average lesson in your core subject?". This provides an open-ended question where the participants can answer and provide information where they feel it is most important.

The second core question related to class planning and preparation, Lameras (2022), Wong & Mahmud (2023) and Baidoo-Anu & Owusu Ansah (2023) all suggest ways AI can help improve lesson planning, thus constructing the question, "Can you walk me through your process when planning a class (Have/Do you utilise AI in this process?". This can help establish alignment with the current literature.

These two questions provide an open-ended opportunity for the participants to answer and explore, encouraging them to answer the other questions created in a meaningful context. Questions continued to be created around the literature, exploring the connection between UDL within each teacher's classroom and their views on the current guidance about AI and how this can be improved.

Once the initial ten questions were established, they were provided to the supervisor for evaluation. The questions were then updated with the feedback provided by the supervisor to remove or change some wording to ensure they could not be misunderstood as much as possible. The pilot interview with Cid followed this stage.

3.6.2 Pilot Interview

The pilot interview provided an opportunity to gain more insight into the questions and their effectiveness. This interview was conducted with a teacher who also presented as a critical friend for the interview and pre-interview stage during planning. This person has been referred to as Cid. Cid followed all the steps an active participant would follow, including signing and reading the consent and plain language documents. During this process, two minor errors in the plain language statement came to light, including the headings' numbering and spelling in one of the signature sections.

The pilot interview took place over teams and consisted of 10 questions, with two questions added in situ based on Cid's responses. These questions were "How has your view of AI evolved in the last 1-2 years?" and "How have your interactions with AI changed in the previous 1-2 years?" both open questions related to experience yet can provide deeper insights into the participants understanding of AI.

The interview with Cid took approximately 50 minutes. This took the form of a semi-structured interview where the use of probing questions is possible to gain more insight into a participant's experience, as suggested by Smith et al. (2022). After the interview, the updated questions and new understanding of the situation were relayed to the supervisor to ensure all changes and updates were within the project's scope.

3.6.3 Conducting Interviews

As with the pilot interview, all interviews for this research were conducted on Microsoft Teams. This has two primary purposes. The first is that the interview could be conducted with anyone who had access to the software at any time, removing

time of the day and location as a limitation on gathering data. The second is the in-build transcript and recording of meetings stored on a secure server, limiting access to only those who should have access to the interviews. The interviews followed the semi-structured approach suggested by Smith et al. (2022). This allowed the participants to engage with the questions comfortably, enabling the interviewer to use probing questions to gain clarification or delve deeper into a topic that may have been missed.

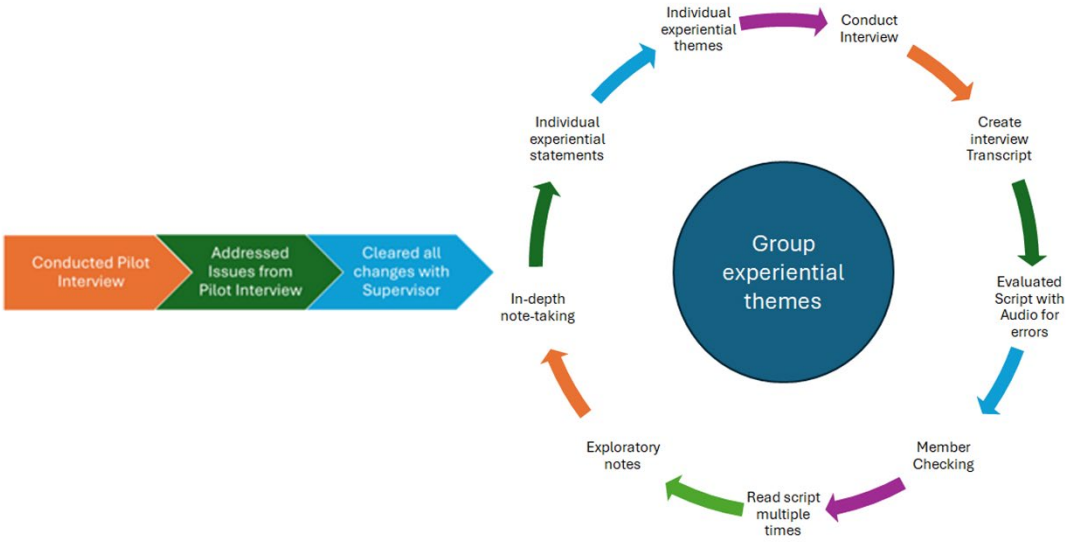
At the start of each interview, consent was again confirmed for each participant, and an overview of the expected time limitations of the interview and post-interview process was provided. Participants were reminded that the session was recorded, and confirmation that they consented to the recording was again established.

An interview guide was created to ensure all participants would be asked the same questions. However, the context of these questions can change depending on the participants' previous responses. As such, the framing and refocusing of these questions took several variations throughout the process, requiring the participants to reflect on their own experiences. Throughout the process, participants often tried to engage in dialogue and posed questions towards the interviewer. This was responded to with an offer to answer any questions of the interviewer's view or thoughts on the topic after the interview was complete to ensure the integrity of the interview was maintained and was in line with the guidelines set out by (Smith et al., 2022).

3.6.4 Data Analysis

Number: Figure 3

Name: Steps of Analysis



The evaluation of the transcripts took multiple steps, with extensive periods between stages to allow the researcher to comprehend the transcripts fully.

Stage 1 involved reading the transcripts multiple times, as suggested by Smith et al. (2022). Reading the transcripts in the beginning stages involved listening to the recording and looking for mistakes in the auto-completed transcription. While no significant errors were noted, Teams often miss-represents filler words such as "um, and, eh, etc"., resulting in some minor alterations needing to be made as Smith et al. (2022) state that the transcript should be done verbatim, and this was ensured at this stage.

Once the transcription was completed and minor errors were fixed to the best of the researcher's ability, any identifying information was removed to ensure anonymity. This anonymised transcript was then returned to the participant to ensure it was anonymised and represented what they had intended during the interview. No

further transcript evaluation was conducted until a participant confirmed the transcript was correct and consented to continue the analysis. Once the Participant confirmed that the transcription was complete, anonymised, and acceptable, the process of reading and rereading began. After several iterations of reading the transcription, exploratory noting took place.

Exploratory noting involves reviewing the transcription and noting the most prominent emerging themes. (Smith et al., 2022). This was done simply via pen and paper with the printed transcript; each line was numbered, margins were set to wide, and line spacing was 1.5 to ensure easy notetaking (Appendix 6).

After exploratory notetaking, more in-depth notetaking of the transcript took place, still part of stage two; however, the level of detail increased to evaluate a deeper understanding of the intended information within the transcript. This notetaking formed the basis for the next stage of analysis(Appendix 7). Smith et al. (2022) recommend following the steps within their book. To this end, the next research stage followed the guidance on experiential statements (Appendix 8). They focused on the core meaning emerging from exploratory notes grounded in the transcripts. Exploratory notes were evaluated and turned into valid experiential statements that could be evaluated for common themes.

These experiential statements were printed and colour-coded to visually represent the different participants' views easily. These statements were also printed in an individual document where they could be analysed in isolation, looking for themes and sub-themes within each statement contributing to the overall understanding of the data.

The colour-coded experiential statements were then stuck to a whiteboard and separated into groups (Appendix 8). These groups were then connected through

lines created by whiteboard markers, creating personal experiential themes (Smith et al., 2022). This was done for each participant in isolation, evaluating their personal statements' interpretation meaning and grouping them into valid personal themes. This can be seen in Appendix 5.

Once the experiential statements for each person were complete, they were grouped into experiential themes and cross-compared to one another as a group. First, the more prominent theme would connect the minor themes for each individual. This was done much like establishing the experiential statements and their themes for the individual using a whiteboard, a marker, and the blue tack. This allowed the researcher to establish the commonalities among all participants and the divergence among participants. Some minor themes could not be categorised individually into more prominent experiential statements throughout this process. However, they could be categorised into a category at the group level. While the focus of these themes is not the purpose of this research, the appearance of such a convergence in each participant, which shows a common thread among all participants, could be an exciting area for further research should a researcher choose to explore this area. This was all done in alignment with Smith et al. (2022) guidelines as outlined in their book.

The findings of this research will be explored in detail in the findings section of this paper. Throughout this paper, the participants participated of their own free will. They were given multiple opportunities to address any issues they found within the transcript, and further ethical concerns or limitations are listed in the following subsection of this paper.

3.7 How themes were established

When evaluating the experimental statements established during the data evaluation stage, three main areas became apparent; the first was statements related to UDL and improving the classroom environment for students. This data forms the grounding for the assumption that these teachers are, in fact, using UDL in their classrooms. These statements contributed to the "grounded in UDL" theme, which includes multiple modes of engagements, multiple modes of representation, multiple modes of action and expression (CAST, 2024) and how the teachers are using reflective practice.

Following this, the main focus was on the experience related to AI, which falls into two main sections: positive statements about generative AI and explaining how generative AI can be used positively to help and assist learners. This was contrasted by how generative AI can be used negatively, making current assessments no longer fit for purpose. This formed the main focus of themes 2 and 3, which were called "Concerns around AI and authenticity of work" and "AI as a teaching and support tool."

Finally, theme 4 relates to the concerns that teachers presented, not about how they can use generative AI to teach but how they will be introduced to generative AI as part of continuous personal development. Bringing to light the experience of these teachers in similar situations and how they believe the mistakes of the past can be avoided. These concerns and historical mistakes in similar areas informed the creation of the final theme, "CPD and Issue in Disguise."

3.8 Ethical Implications

Ethical approval is a core element of conducting a study at the master's level. As such, ethical approval was sought to proceed with the study. The National College of Ireland is the body that granted ethical approval for this research. The process involved submitting an ethics proposal to the ethics board, where the proposal was evaluated, and any issues were remedied. The issues for this project were limited to spelling, word order and clarification of research paradigms. Ethical approval was granted on 12/02/2024, and the pilot interview took place on 04/04/2024.

All participants who took part in the study did so on a voluntary basis. They provided written consent before the interviews, verbal consent at the time of the interview, and written consent after the interview transcription was anonymised and returned for evaluation. Participants ensured that the transcription correctly represented the views of the participant at the time of the interview. One interview transcription required an alteration to redact some information. The redacted information was not critical to the research and provided no issues at the time of analysis.

Throughout this project, GDPR guidelines have been upheld. The research guidelines outlined by the National College of Ireland have also been adhered to. At no point during the research was any protected group member contacted or participated in the study. All information related to the study that was provided to the participants was first approved by the ethics board.

All data gathered for the project was stored on the OneDrive service provided by Microsoft, available through NCI. This is in accordance with the NCI ethical guidelines for research. Only the researcher has access to files in which any

identifying names or identifiers could be provided. These were then deleted after one month, leaving only the anonymised transcriptions remaining.

3.9 Quality Considerations

Riggs & Treharne (2015) highlights the importance of quality in research, stating that there are five core pillars to ensuring quality within a research project. These include credibility, transferability, dependability, confirmability and authenticity. Birt et al. (2016) state that it is essential to have transparency when implementing member checking, establishing the actual reason why it is being implemented in this case and ensuring that it aligns with the epistemological stance of the research paradigm. As this is an IPA research project, member checking was done to ensure that the data truly represents the participants' views. Member checking was also done to ensure anonymity and compliance with GDPR.

Each core pillar is highlighted by Riggs Treharne (2015), however, some of these pillars are not openly discussed in this chapter. They are presented throughout the process and transparency of the research approach used for this project. However, all efforts have been made to ensure that these pillars are upheld and that this research can provide insight into the current situation regarding generative AI in FE.

3.10 Limitations

The limitations found in this project come from multiple different aspects of the topic being researched. As highlighted by many researchers, generative AI is in its infancy within the field, and as such, the information provided here can be quickly outdated. The information gathered also represents a tiny sample group of only five members, as suggested by Smith et al. (2022) while this in itself is not enough to

establish an overarching understanding of teachers' attitudes towards AI in general, it may contribute to the literature in a way in time that provides a demonstratable, valid, and reliable contribution to the literature as a whole, allowing further research to be developed in this area.

The project is completed by a single person, and with a more extensive team of researchers, more data could be gathered and analysed. The cross-sectional nature of the study results in no long-term data being gathered to track the ongoing adaptation of AI.

This chapter of the paper has explored many of the aspects that should be considered when exploring a research paradigm and methodology for conducting a research project. The research project has been conducted in accordance with an IPA approach to research as outlined by (Smith et al., 2022). Information was provided on the researcher's stance and worldview, all suggested by D. Holmes & Gary (2020) Providing more information on fully establishing the lens through which the researcher will conduct their data analysis and data gathering processes.

An evaluation took place of the process for gaining ethical approval from NCI, the process in which they prepared for the interviews through a pilot interview process, evaluation of the interview process itself and what was provided to the participants regarding their continued consent. An explanation of the data analysis process from exploratory notes to deep analysis of experiential statements, experiential themes, group themes, and divergent themes and how they were established. A short exploration of quality considerations and how the use of member-checking (Birt et al., 2016) and a journal (Riggs & Treharne, 2015) helped the researcher to ensure integrity and academic rigour. An acknowledgement of the

limitations within the project is highlighted, along with the hopes that these limitations may, in time, help this paper to become part of the literature in this area.

4. Findings and discussion

This chapter of the paper will present the findings of the research conducted as outlined in the methodology chapter. The data presented in this chapter of the paper represents the experience of the participants through the researcher's interpretation of the information provided at the interview stage. Participants had the opportunity to have any information that does not reflect their true experience removed from the transcript. These experiences were examined in relation to the question of "How FE teachers are adapting to the use of AI in a UDL-empowered environment" focusing purely on the experience and providing effect from the teacher's perspective.

Through multiple steps of analysis, the following key findings constitute the most important, surprising, and relevant information for this project. The first subsection will explore the teacher's alignment with UDL (CAST, 2023) within their practice.

Number: Figure 4

Name: Group experiential themes discovered

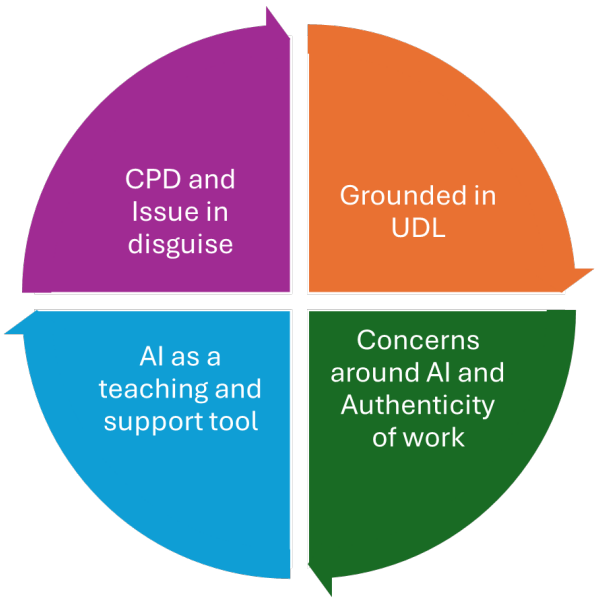


Figure 4 depicts the four core themes of the data analysis. Theme 1 focuses on the grounding of the project, showcasing the teacher's commitment to UDL and how the teachers are implementing UDL in their classrooms. Theme two focuses on the current concerns around generative AI and how the teachers feel this can/is affecting them in their professional capacity. Theme three explores AI as a teaching and scaffolding tool, exposing the ways in which some of these teachers are leveraging the use of generative AI to improve the teaching and learning experience for all involved. The final theme, four, focuses on the issues that have historically affected CPD and ways that the teachers feel this could be improved in the future.

4.1 Theme 1: Grounded in UDL

This theme relates to the teacher's alignment with UDL and elements of their teaching practice that follow the principles of UDL in a meaningful way.

One of the core assumptions within this project is that the teachers are, in fact, implementing UDL principles within the institution. This was explored through the use of open-ended questions that encouraged teachers to bring forward their teaching methods and pedagogies.

Vincent implements a flipped classroom where they "forward the theory" to the students in advance and "put theory into action" during class time. Providing students with" video resources…that would generally accompany my class", providing a simple reference point. Vincent builds multiple modes of expression into their assessments, stating, "I build into the project that I am delivering as many options as possible for the student". Highlighting two of the main concepts of UDL, multiple modes of expression and multiple modes of representation, as highlighted by CAST (2023).

Elena's approach to UDL is more reflective and focused on engagement within the classroom. They highlight the principle of multiple modes of engagement as a guiding principle. While also giving the students agency within the classroom, "the idea of students being very clear about what they're doing and why they're doing it". Building lessons "based on conversations that I have with them (students) … so I can figure out how/what I do next with them". Scaffolding is implemented through the use of "templates…very clear guidelines on what is expected of them… how long to spend on an activity or an exercise…how many words to put into something" with the end goal to "support them with managing their own learning". This scaffolding method would align more with hard scaffolding (Chen & Law, 2016), where the guidance is rigid and unchanging. The UDL methods implemented by Elena also highlight the cross-theory capabilities of UDL with elements of andragogy, where the learners should have a clear understanding of the reasons behind the lessons (Gould, 2009) and the tasks being presented.

Cissnei utilises a central hub approach to storing and sharing data with their students through the use of Notebook through Microsoft Teams. Through this central hub, they often provide podcasts "for the students." Assessments have been accepted as audio format files "I've taken assessments as audio recordings"; however, this was an exception due to student circumstances. "Notes are available a day early" so students can have "their version" and "annotate them." UDL, in this case, has some level of multiple modes of representation and a willingness to implement multiple modes of expression when needed by the student.

Reeve employs multiple modes of representation through "different approaches, delivering your material in lots of different ways." Multiple modes of expression enhance this, as students can submit work in multiple formats. This can

help with "some people struggle with words, so you have to, you know, give people an opportunity where they can speak." assessments can be submitted through video. They demonstrated UDL principles once again through classroom involvement.

The final teacher who took part in the study is Don, whose implementation of UDL is focused on good implementation of practical skills within the subject area. "So, I'll give an example of a technique… we'll see it in practice in an established produced work… I'll demonstrate the technique to achieve the final result." In this one example from class, we can quickly establish the link to multiple modes of representation and implement a simple yet effective implementation of UDL.

The examples provided within this subsection highlight the diverse use of UDL in many teachers' practices. Showcasing varying commitments to the three principles of engagement, representation and action and expression (CAST, 2023). UDL is an ongoing process of improving over time. They are enhancing their classes and student accessibility in relation to class content and assessments. This results in a student-centred approach, as explored in the following subsection of this chapter. UDL is an iterative framework and improves over time (Altowairiki, 2023) as such, it should be noted that these are only some examples of how UDL is being implemented within these teachers' classrooms and do not constitute an exhaustive list of UDL implementation. This provides evidence that UDL methods are being implemented within the FE teaching practices, setting a solid grounding for the introduction of generative AI as an additional teaching tool. Through the multiple iterations of UDL, the core principles can be lost. Don warns against the use of UDL as an agent to pass students for set disciplines that demonstrate knowledge in a non-industry manner "There is a point where I'm putting people into an industry that I know, and they can't use (insert mode of expression) here.". In cases such as this, it

is of particular importance that teachers curate acceptable formats of expression in a way that benefits the student. Don again asserts that "there are things that are expected in industry". As such, the use of UDL can not be done in itself without critical reflection and curation. Generative AI may be able to assist in this area through the use of scaffolding methods. Researchers (Lameras, 2022; Pearce, 2024) have suggested the use of generative AI as a feedback mechanism. It may assist students who find it challenging to ask for assistance or clarification from their teachers.

Of the teachers interviewed, all teachers highlighted the need to curate content to the student's ability within the classroom, with Cissnei explaining that two groups of students who are taking the same module at separate times can be at vastly different points in the module and have different learning preferences. This, while an important factor, is not the only area of concern.

Reeves brings to light the differences found within class groups "In FE, we have a very diverse range of students" exploring the limitations found with accessibility for students "I am also aware that there is a huge gap between some of the students and their accessibility to AI and that technology… I want to make sure I can level the playing field." This is contrasted by Vincent, who encourages students to use AI such as ChatGPT via their phone "All the student needs are a phone…So the students already have that tool… every student has a smartphone". The issue may not, in fact, be the access to a phone but the access to the internet while at home, as explained by Reeves "Some students don't have access to the internet at home". According to the Central Statistics Office (2024) almost all households with children have access to the internet. However, there is still a small number who do not. This also does not consider the current student body who may be living in

temporary accommodation. While this is a major concern highlighted by QQI (2023) this does not represent the final consideration when curating content to students. The overall context of the course must be considered.

The module does not represent the whole context in which the lessons are being taught. Elena explains, "drawing for game designers would be very different to preparing a class of drawing with furniture designers." This highlights the need to curate content for class groups not only based on the module but also on the context in which the module is being taught. This is then in connection with other considerations, as explained by Vincent "in reality, you're responding to the capabilities of the class and also the time constraints that are on you". Many teachers, including Vincent, Reeves, Don and Cissnei, express the issue of time constraints. These demonstrate the limitations found within class planning in relation to the student and the context of the subject area. However, one more important consideration came to light.

The final end goal of the student may not be academic success or career progress in the traditional sense. Don highlights that the end goal of the student may not be what we, as teachers, expect it to be. "If our students are going to do three years of study and then become Youtubers, they probably have just lost themselves three years" Should they want to do this, there is no issue, but our "aim is a little higher at the moment".

This theme has highlighted many of the challenges that arise within the teachers' day-to-day classrooms and classroom planning concerns that they need to be aware of. With the diverse student groups, linking modules and content in a way that makes sense and navigating the goals of the students and the limitations they face. The ever-challenging environment that is teaching requires teachers to take on

a reflective approach to the process to evaluate how their adaptation is affecting the learning experience. This theme has highlighted the need for awareness of student difficulties when considering the use of AI within the classroom, QQI (2023) has highlighted this in their policy documents relating to generative AI. This awareness of student diversity of needs is also embedded in UDL, once again reinforcing the use of UDL by these teachers.

This serves as a reminder for all teaching practitioners that access to technology within our classrooms does not represent the technology accessible to students at home, and this should inform our design of assessment and revision methods.

They showed that the teachers are engaged in reflective teaching strategies (Mohamed et al., 2022; Richards, 1995) to demonstrate a willingness to adapt to new situations that arise and their commitment to improving the learning experience for the learner.

All the teachers who took part in this study engaged in reflective practice to some extent. However, three of the participants showcased a more active and intentional reflective approach. These include Cissnei, Ellena, and Vincent.

Cissnei has multiple aspects of reflection that are implemented at various stages throughout the year. These include an online central hub "I have a class notebook…That's kind of the baseline, and then I've populated it with new articles", ensuring the content is always relevant to the class groups and creating a digital record of alterations to class content. If the class did not go as intended, Cissnei would return to this notebook and look for areas to improve "straight after, I will try and go back and put something in for next year", demonstrating an immediate reflective action within their practice. This is contrasted by Ellena, whose reflective

approach incorporates the views and input from students in a more direct format, providing students with the opportunity to ask questions in an anonymous format "I give them two post its…on the second they write down a question I (the student) still have". Ellena then addresses these questions and adapts their lessons in response to the questions in the post its notes. When focusing on AI, Ellena said, "I'm having conversations with other people in the staff room, and that'll be something that I'll do more over the coming weeks." Highlighting the willingness from both teachers to adapt and pre-empt the situations that can arise.

Vincent follows an approach similar to Ellena. Vincent stated, "I would ask the students, can I deliver this in a different way for you?" Vincent also records videos of theory and class content as outlined in their UDL implementation, allowing them to address their delivery of content through an active approach. Unlike their fellow teachers, Vincent has asked for feedback on how to improve classes from generative AI, stating

> "Sometimes, if I were struggling with something, if I taught a class and it didn't go well, I would maybe use the AI to go.
>
> What do you suggest I do instead?
>
> Just use it as a prompt for me." (Vincent)

Highlighted in This chapter is the willingness of these teachers to adapt to the situations and update content to be more accessible to the students in their classroom. This willingness to adapt is not without its trepidation. The concerns around introducing AI into the classroom are vast, and all teachers showed a level of trepidation.

4.2 Theme 2: Concerns around AI and authenticity of work

This theme will explore the concerns that teachers have expressed in relation to AI and how these concerns have arisen. This will explore the different views of the readiness of AI as a teaching tool, how teachers have found students interact with AI in a negative light, the teacher's perspective on identifying AI and finally, the concern of inherent bias in the AI data set.

"Some of the resources (AI technology) available right now for the students that I teach, it's not really there yet to sort of teach them" (Reeves). Reeves highlights that AI is still developing, becoming more advanced at a rapid pace "as educators in third level, if we can't grasp it (AI), you know, we're going to be left behind." Yet not all the teachers felt this concern. Ellena points out, "It's like this year is the first year I've come across it (AI) because it does not even factor in with the core student." Don has expressed similar concerns, stating that "I am no more vulnerable than the film board or any of the high art places that have been caught really badly and really publicly." These two views appear to consolidate one another. However, Ellena continues and explains that in more digitally focused subjects, they have seen what they believe to be essays generated by AI submitted as evidence for assignments.

> "They're (the submitted work) very, very superficial… there are about 6-8 paragraphs at the end of these essays where it's just evaluation, conclusion, evaluation, conclusion… saying the same thing over and over again six different ways…I think they're definitely AI-generated essays." (Ellena)

The connection between generative AI and assessment has been examined in the past by researchers such as Qadir (2023) suggesting that students can use generative AI to help with writing essays. Fleckenstein et al. (2024) however,

contradicts the perceived experience from Ellena, Fleckenstein et al. exposes the lack of ability for teachers to recognise AI-generated work, suggesting that teachers overestimate their ability to evaluate the true source of written material.

When asked to explain more on this with a focus on how the briefs are created, Ellena pointed out the use of Bloom's taxonomy as a grounding for their assignment briefs. Bloom's Taxonomy, explored by Elsayed (2023) has a marked effect on how the AI generates content, resulting in less coherent answers. This experience described by Ellena appears to back up this research in a real-world situation. Reinforcing the need for good solid theoretical grounding in assessment design when creating assessments.

Reeves introduced AI to the student cohort at the start of the year "I introduced it, I mentioned at the early part of the year… I have to be honest, and I still received submissions that are clearly completely ChatGPT." However, Reeves states that "there are some telltale signs…I'm experienced enough to … I can recognise it". This theme of teachers stating that they can recognise AI-generated work is present among all the teachers interviewed. Ellena, as presented above, Cissnei's approach is more grounded in exploration and research after the submission, including "I always look at the report (Turn it in), even if it's green lit… I want to see where they've drawn most of their information from." This in connection with their experience in the area Cissnei states "you can tell it's not their (the students) voice". Don continues this trend by saying

> "It's (AI-generated content) just a bit crap… this is a perfectly typical example of all of the things that you've referenced, but they're all YouTube tutorials with bad cuts and very little artistic merit" (Don)

These experiences of AI and the identifiable quality of AI-generated content align with the research conducted by Hinman (2023). However, this finding hints at the idea that there is something more than incorrect links or spelling and grammar at play. There is something present in human-generated content that AI can not yet generate. Cissnei provides a simple yet effective warning around this concept "obviously, it will improve… it won't sound as wooden or something". Neumann et al. (2023) highlights the ineffectiveness of relying on software such as turn-it-in, yet as we can see by Cissnei's response above, this is something that teachers may not be fully aware of.

The perceived experience of these teachers contradicts the findings of Fleckenstein et al. (2024) Cissnei and Ellena are steadfast in their assertion that they can detect AI-generated work. However, the literature suggests otherwise.

The final common concern highlighted by the teachers in this theme relates back again to Hinman (2023) and that data set in which the data is generated. Baidoo-Anu & Owusu Ansah (2023) has raised the issue of biased data sets, and this concern has been reasserted by the teachers who are also concerned about bias in the data set. Don has exposed this bias in image generation while attempting to add more empty space to an image. The generative fill would constantly add people from a set geographical location. "When I said to expand the background, and it was putting in disfigured people", all from the same geographical area showcasing a limited data pool. Vincent has also expressed that the use of AI as a tool is limited in its scope, stating, "If I need factual sociological information… I would not go to AI because I think it's quite biased."

Reeves highlighted at many stages in the interview process the concern for students who may not have access to or previous knowledge of AI at home or in the

classroom, stating, "I think we really need to make an effort not just to bring everybody up to speed but to start being positive and educate students on what they can do and what they can't do with AI". Reeves also highlights the difference in student awareness of AI "what I want to mention is the disparity between students and their awareness of AI". This insight from Reeves exposes, when connected to their statements above relating to student access to the Internet, a hidden subgroup of students who have not been considered in this conversation. The literature explores students who will have access to all these resources.

This theme has explored the main concerns brought to light by conducting this study. Many of these have been highlighted in the literature in a meaningful way. However, there is more to explore in this area. Neumann et al. (2023) starts the conversation around AI and how it has a fingerprint, Cissnei suggests that AI may have a voice or style of writing, Don highlights that there is a standard that AI generate, and several teachers highlight the concern of bias within the data set so clearly there is more within this area to investigate. Yet all this is countered by Fleckenstein et al. (2024) who's findings highlight the bias and fallibility of teachers' assumptions in identifying AI-generated work. When compared to the confidence of the teachers who took part in this study when assessing student submissions and their ability to discern AI-generated content, this could lead to difficult situations within academic circles as biases may play a part, resulting in incorrect assumptions.

The identifying feature of AI is not the main concern when AI comes up in conversation. The academic impact of AI is often at the top of the list. As seen with Reeves, who introduced AI at an early stage during the year, AI was still utilised by the student to submit work, and the reliance on software such as turn-it-in is still embedded in the teaching culture, as seen by Cissnei's responses. Reeves also

highlights a valid point in that some students are being overlooked in this conversation. While this paper explores the teacher's perspective, it would be of paramount importance to get the students' perspective and those who do not have access to this technology. QQI (2023) has also explained this concern about student access to AI technology, and as such, should not be overlooked.

Even with these concerns highlighted, the use of AI is simply not going to go away. These teachers, with their concerns, have explored the use of AI in some way in relation to their pedagogy and planning. The use of AI as a planning tool is not a new occurrence and has been seen in the literature. The effects of AI on education cannot be understated. Teachers need to be aware of their own overconfidence (Fleckenstein et al., 2024) when it comes to AI-generated work. Teachers must rely on more than our feelings to determine if some work is AI-generated. As Ellena has reaffirmed, there is a pre-established theory in Bloom's taxonomy that may act as kryptonite to AI, reducing its ability to perform its actions.

4.3 Theme 3: AI as a teaching and support tool.

This theme will explore the use of AI as a planning tool within the institution and how the teachers would implement these planning methods. While AI can be used as a planning tool, there are warnings involved, concerns around transparency, and informing students of the correct use of AI.

Throughout this research, it has been made clear that each teacher has had a different level of experience and exposure to the use of AI. Ellena's exposure to AI has been limited, and only in recent months, upon reflection of their experience this year, have they begun their exploration of AI in a meaningful way. Cissnei's exposure to AI has been limited, although it is more in-depth. Coming at this from the perspective of a researcher and scientist, Cissnei has used co-pilot in two main

ways. The first was to test if their assignment would be fallible to being completed by an AI

> "The last assignment is not one that they can research… so I thought, OK, will the AI be able to do this?... I thought it was very poor from an academic point of view. It was copying and pasting from the internet" (Cissnei)

This exploration of AI continued into the creation of MCQ. Cissnei expressed, "MCQs are hard to write. They are time-consuming." Because of this, she employed the use of AI as an assistant to create these. The prompt used was "create a ten-question MCQ on the nervous system… when I went from 10 to 15 questions, it would give me the questions. Then it goes. You'll have to find the answers yourself." Cissnei displayed frustration at this, stating, "You're supposed to be saving me time, not making me go do the exam myself." Singh et al. (2022) suggests content creation as one of the possible uses of AI. This appears to conflict with the experience of Cissnei's attempt at content creation, which lacked academic rigour, yielded no time-saving effect and caused frustration in relation to the AI's output.

Another area suggested in the literature by the researcher Taneri (2020) is creating lesson plans that may be more efficient using AI, such as ChatGPT. Vincent is one such teacher who has used AI to assist in the generation of lesson plans.

> "At the start of the year, I asked it to generate me my lesson plans. So, it wrote all my lesson plans for me ... But when I say it wrote my lesson plans for me, it wrote the first draft of my lesson plans for me, and then I took all the lesson plans I had in the past and compared them and redrafted and cherry-picked the best... I have to say it actually gave me back pretty much what I already had" (Vincent)

Don is another teacher who has also explored AI to create lesson plans. Don explained

> "I'm not a fan of over planning, so as an experiment with AI last year, I just asked it to do it. Here's what I'm supposed to do. What would you do? (speaking to the AI) and it did. It seemed fine. It seemed more structured than I would have done myself". (Don)

Reeves has also implemented AI in their planning, explaining

> "it's dangerous to use it verbatim, but I mean, it can give you insights that maybe wouldn't have occurred to you. It's a really valuable resource, and I think it would be silly as educators to just not tap into that resource, but I mean, I use it as indications maybe it can point out something that maybe you would not have thought of" (Reeves)

While these show various levels at which AI has been introduced into the planning stage, it is clear AI is ever only used as a starting point, as expressed by Qadir (2023) AI can be used as a brainstorming tool to provide inspiration. Qadir (2023) suggest that this use of AI can be implemented with students, but there is a clear demonstration of the same implementation among teachers. However, as expressed by Reeves, it is dangerous to use AI verbatim and thus requires the experience of a teacher to curate the data. This then raises the question of whether AI is truly valuable as a planning tool for an experienced teacher. The data generated by the AI, when compared to Vincent's collection of historical work, yielded similar results. Does that then mean that AI can be of more benefit to a new teacher starting their educational journey than to a teacher who has a wealth of knowledge and experience?

Ellena, while not an active user of AI to generate content, does have concerns. These concerns focus on the use of AI not as a simple tool but as a replacement for good understanding and knowledge in the specific field, specifically, teachers who focus on the "chalk and talk or sage on the stage if that's what they do in their teaching practice then the way they use Chat GPT is going to do nothing for the profession." This highlights a concern among teachers about the misuse of AI, such as Chat GPT. This is backed up by a concern raised by Cissnei, who calls for more transparency in both teacher's acquisition of resources and our use of technologies such as ChatGPT.

> "We take other people's work, and we stick it in PowerPoint, and we might put a tiny little Smith and Jones 2020 in the bottom but we're not putting a reference list at the end of our PowerPoint... And I've talked about this when I turn around and crucify them (students) like, go and where is your reference list, particularly level 6? Not one of them has said it to me." (Cissnei)

Reeve expresses a level of questioning exploring the topic of transparency, stating, "But yet, for teachers to do in relation to AI to create lesson plans and create sort of material, do they have too... disclose that to the student the way we're asking students to disclose that to us." This exploration of what is required of the teacher when related to AI is an ongoing question that is not answerable within this paper. Transparency is a principle found within many aspects of education, and this may be another area where transparency is required.

This theme explored the different ways in which AI has been used as a planning mechanism. With varying levels of exploration from the creation of MCQS to assessing its viability and answering questions, completing assignments, and creating lesson plans, it is clear from the warnings from the teachers that AI cannot

be taken at its word and must be curated and assessed through good judgment and the lens of experience.

The use of Generative AI is not limited to scaffolding but can also be used as a teaching tool. While not all teachers have fully embraced the implementation of AI as a teaching tool, two teachers have used AI in meaningful ways to assist in the teaching and learning process for students, thus enhancing their experience.

Among the teachers interviewed, two have implemented AI into the classroom in a way that can be examined and evaluated to establish its viability. While the focus of this paper is not to check for its viability, this avenue of exploration is available to those who pursue it. The first teacher who has implemented AI in their classroom is Reeves. Reeves has explored the use of AI as a scaffolding tool to assist students who may find a particular task difficult. Reeves explains that there are criteria for using this method.

> "The student had to do a skills demonstration… they had to write a script to enable them to do this presentation, which was going to be video recorded. They were struggling a little bit… with the script they were struggling and not quite sure what to put. So, I allowed them to use ChatGPT to generate the script for them because it wasn't part of the submission" (Reeves)

In evaluating Reeves' statement, two core criteria must be considered. The first is scaffolding. As outlined by Belland (2017), scaffolding can be implemented in which the teachers establish the students' abilities and construct a way to support them in completing the core task of the assessment. This assistance can include collaboration and technology. This is in alignment with soft scaffolding (Chen & Law, 2016). The core task for the assessment was to perform the recorded presentation. The content of the presentation in terms of script is not relevant. Under the guidance

of Reeves, the student created a script using generative AI. As it can represent a role-playing agent with which the student can collaborate, it is a software form of scaffolding as it makes the core element of the assessment more accessible to the student through collaboration with software. The issue of bias inherent in the AI can still present a challenge. However, this can be mitigated by the guidance from Reeves, who is an active member of the process. This allowed the student to alleviate a level of stress and focus on the important element of the task.

The second is that the teacher was part of this process, with open communication between the teacher and the student. Allowing them to establish the correct course of action while ensuring assessment validity. Reeves added that for their submission, it must also be "acknowledged by the student that they had used Chat GPT to help them generate the script". This aligns with the findings of Pearce (2024), who stated that students are using AI with their teacher's guidance. Wong & Mahmud's (2023) suggestion of using AI in innovative ways to assist students in their learning journey is also an alignment in this case.

Vincent is perhaps the most experienced teacher in this sample group when it comes to AI. Their respective fields of study require constant vigilance on the emergence of new and innovative technologies. Vincent also makes a clearly defined distinction between AI and generative AI. Vincent provided two examples of how generative AI is implemented in the classroom

> "One is we would just get the AI to generate a script, so say, here's the theme, here's the plot. Write me a script so that we could just use it directly... I get the AI to generate the material, and then we will reflect on that material." (Vincent)

This demonstrates two important aspects of the use of AI in the classroom. The first is that the teacher is in control of what the AI is responding to. The second

is the analysis of the generated piece demonstrating, as suggested by multiple teachers in this study, that the data must be analysed as stated by Reeves" it's dangerous to use it verbatim". Vashista et al. (2023) highlight the belief that AI can be used for critical thinking and collaboration among students. Vincent demonstrates critical thinking and evaluation of the content in collaboration with the students, confirming, in this case, the belief highlighted by Vashista et al. This, however, is not the only instance of AI application in Vincent's classroom.

Vincent implements AI in a way not seen by the other teachers. The AI is used as a role-playing participant. Vincent describes this process as

> "We would say to it(AI) you are a film producer, and I am pitching you a film, so we would give it a scenario, and then we would ask the AI chatbot to then ask us questions, so ask me questions about my film and do not ask me another question until I have responded to the 1st and then at the end of our discussion tell me whether or not you would produce my film or direct my film so we would use the chatbot in a scenario where we want to give a presentation or pitch or have interactive feedback on an idea, on a draft, on an image, or whatever so we use it that way quite a lot now" (Vincent)

Baidoo-Anu & Owusu Ansah (2023) suggest the use of AI as an interactive agent within the classroom. This implementation of AI as a role-playing participant backs up Baidoo-Anu & Owusu Ansah while also contributing to critical thinking and receiving real-time feedback. Vincent demonstrated in the interview that ChatGPT can be used through voice commands and will respond through audio means. This can provide students who find reading challenging a way to engage in the content more easily. Allowing for more active ways of gaining feedback through the use of generative AI, as suggested by Pearce (2024) and Qadir (2023). This reinforces the

study done by Lan & Chen (2024) who uses a similar approach as Vincent through curated and specialised prompts. The implementation of AI in the classroom is no longer theoretical. This demonstrates multiple modes of representation provided in one program. There are two ways in which content can be accessed, and there is the possibility of asking for more clarification of areas in which the student does not fully understand the feedback.

AI is being used to help scaffold assignments, engage students in meaningful ways, and provide real-time feedback on the content being created by the students. It is being implemented and facilitated by educators. Yet not all educators have taken this leap and are responsible for exploring this new development and technology that can enhance teaching and learning. The next theme will explore the teacher's view on how, historically, the introduction of new technology or methodology has been implemented and how it has affected them as teachers, highlighting what they feel would benefit them most in adding this new technology to their current workflow and pedagogies.

4.4 Theme 4: CPD an issue in disguise

This theme will give a brief description of CPD and how it is viewed by some of the teachers, as well as the limitations and apprehensions that these teachers have about engaging in CPD within the institution. While it is clear from the literature that some level of training is required, historical CPD situations could be considered. Ellena describes CPD as, "I always feel that somebody's taking their knowledge and dumping it on me instead of looking at where I might need help."

Lameras (2022) describes AI systems as mysterious and unfamiliar, and teachers are unsure of how to implement AI education into their current practice. Sayed Al Mnhrawi & Alreshidi (2023) reports that participants faced difficulties

accessing data and communicating with peers when adapting to the new technology during their study.

Historically, the implementation of CPD has followed a specific trend within the institution. Ellena explains the situation clearly in the following statement.

> "But what I am wary of is people who know about technology and that they're the ones who are going to be talking about it, and my experience with the whole digital literacy thing is…if you're struggling with this, people don't want to know. People assume there's a certain level of engagement with this kind of thing, and if you're not at that level, your concerns aren't respected or included" (Ellena)

This apprehension of CPD and its historical approach is shared by Don, who describes CPD as such" if they have a one-size-fits-all policy and they have God forbid CPD on it which will apply basic irrelevance like butter to an entire staff." While both Don and Ellena demonstrate apprehension of CPD, they both have unique solutions to the situation. Don suggests that if there's a problem, you go seek help where one can say, "I'm finding this is getting away from us a little bit here. What do you reckon?" Seeking help from other members of staff who may demonstrate a possible solution to the problem.

Ellena, on the other hand, does not suggest a complete change to the CPD process. Rather, it should adopt a UDL approach for teaching teachers, with two important caveats. The first is described as "I can be shown how to do something, but if I don't need to use that thing for another six months after being shown … that's not going to serve me." This highlights the importance of the time frame in which the training is provided, providing the training where and when relevant. The second alteration to the traditional method would be an open discussion among all members

of staff regardless of technical literacy, describing it as "so I think teachers who are new to this who are struggling with this, I think their views and voices need to be listened to just as much as the authorities' voices."

This theme of the paper has explored the concerns that teachers have in relation to CPD and training in any technological area. The questions posed to the participants focused mainly on AI and generative AI. However, their concerns in relation to CPD remain valid in many aspects, and the implementation of CPD constitutes a large area in which teacher voices appeared to be muffled and silenced for the sake of a box-ticking exercise. The desire for training can be seen in the responses from the teachers. This is in alignment with W. Holmes et al. (2023) and Vashista et al. (2023), who have described the teacher's desire for training in this area. The findings in this theme go a step further in expressing how this training can be adapted to facilitate more accessible content and the time-sensitive nature of such training. This time-sensitive situation is, however, not a case of getting the training as soon as possible instead, training should be provided when and where it is required.

While this is the experience of these teachers and CPD within the college in which they work, this may not be the overarching view of CPD as a whole. All the teachers mentioned CPD in some way in their interviews, with mixed responses, and only Reeves spoke about it in a positive light. SOLAS has committed to providing CPD in the area of AI, along with other colleges around Ireland and abroad, and providing training in AI for teaching and learning. The effect of this training needs to be monitored to evaluate its effectiveness and the ongoing support needed for educators.

This chapter of the paper has explored many aspects of the teacher's perspective on AI. First, by establishing some of the UDL principles being followed by these teachers daily, their understanding and adaptation to different student cohorts, showcasing a willingness to improve both content and content delivery, making it more accessible to students, thus upholding the UDL principle of multiple modes of representation (CAST, 2023). Following this, the focus shifted to reflective teaching practices where teachers are once again reflecting on and improving their pedagogies, showcasing their willingness to find creative and unique solutions to emerging situations.

Concerns around AI have been explored from the viewpoint of these teachers. Initially establishing the concern that students may submit work that is not of their own creation, thus challenging academic integrity. However, three teachers explained that they could identify the AI-generated work Hinman, (2023) describes AI as having a unique fingerprint. While the descriptions here vary, it appears that this fingerprint is not limited to the fraudulent references generated by software such as ChatGPT. The expiration of Ellena's assessment design aligns with the findings of Elsayed (2023) Bloom's taxonomy as a counter to AI-generated content. The final pressing concern coincides with Baidoo-Anu & Owusu Ansah (2023) who raised the concern of biased datasets being present within AI software. An almost unspoken concern in which only one teacher raised this issue was the accessibility of students to software such as ChatGPT or similar AI. This requires access to the Internet and hardware that can run the AI. Another teacher pointed out that students generally have access to a phone, but this may not be the case for all students and should be a consideration when implementing such software.

The use of AI as a planning tool highlighted multiple areas in which teachers have attempted to implement AI in a meaningful way. However, in the case of Vincent, experience far outweighed the software's capabilities. Cissnei's expiration of AI as a planning tool was limited and unsuccessful in creating specific MCQs and as a tool to answer assessment criteria. All teachers who used AI as part of their planning mechanism expressed that it was only that it was part of the planning mechanism, not the entire thing. They needed to curate and cherry-pick the correct information and use it as a possible guide in the direction of which to follow. The warning of Reeve cannot be taken lightly "it is dangerous to use it verbatim". The issue of transparency arose, exploring how transparent teachers should be in their use of AI with students. Reeves suggests transparency is important, while Cissnei highlights the dual standards and the expectations of teachers and students.

The use of AI as a teaching tool is limited in the literature. This paper has exposed two teachers who are actively using AI in a meaningful way. The first is Reeves, who uses AI as a scaffolding tool to assist students in non-graded aspects of their assignments. The second is Vincent, who was actively engaged in finding unique and innovative ways to implement AI in their classroom, including role-play scenarios, carefully constructed prompts, and instant feedback on student-created content. It should be noted that all of this is always under the instruction and guidance of the teacher.

The concept of CPD was explored in relation to past experiences within this institution, showcasing a methodology of information delivery that does not align with UDL and, as such, makes information difficult to implement in a meaningful way. As stated by Ellena "the whole idea that teachers are learning too and that UDL, that applies to students in terms of inclusion democracy, care, well-being all of that

should be just applied to people". The final chapter of this paper will explore findings in relation to the literature along with possible areas of further investigation while highlighting how the findings in this paper can affect established pedagogies of the researcher, the institution, and possible influences on the further research of AI.

5. Conclusion

This chapter of the paper will evaluate the overall connection between the findings and the literature and establish how AI may better augment the teaching and learning process. Highlighting convergence and divergence between the findings and the literature. The limitations of the research will be established once more as more in-depth information may be provided in a longitudinal study. The ramifications of the findings will be examined, providing clear guidance on how AI may be used to improve teaching and learning. The final section of this chapter will explore how the research in this paper has affected the researcher's approach to education and the use of AI and how they plan to use this research to improve their teaching practice—finally, a statement on how this research contributes to educational learning.

5.1 Overall conclusion and contribution

This section will explore the findings of the research and reestablish their connections to the literature. Evaluating the theoretical underpinning of the literature to the lived experience of the participants who took part in this study.

The use of UDL has been proven to improve teaching and learning for students (Rusconi & Squillaci, 2023) use of UDL still needs curation, as expressed by Don, who fears that the use of UDL may not fully prepare students for the industry that they are training for. Rusconi & Squillaci (2023) explains the modes of action and expression, representation, and engagement. This can be seen in the teacher's responses, which provide evidence of video, podcast, traditional notes, and a central hub for class content supporting the representation principle. The multiple submission formats accepted for assessments include video essays, traditional

essays and reports, demonstrations of skills, and presentations, all of which provide evidence of multiple modes of action and expression.

Teachers enhance multiple modes of engagement through peer-to-peer learning, class discussions, roleplay, traditional presentations, and collaborative learning. This provides evidence of UDL (CAST, 2024) implementation within the practice of the teachers who took part in this study. Qadir (2023) highlights the difficulties when a new technology is introduced to established practice. Two of the participants in this study could be considered digital immigrants (Prensky Marc, 2001) ether by their own admission or by the evidence gathered in this study. Cissnei has engaged minimally with the introduction of generative AI, while Ellena has not engaged with generative AI in any meaningful way to date.

Cissnei and Ellena have expressed that they are able to differentiate generative AI content from content created by students. This backs up the study by Neumann et al. (2023) who suggests that humans have a success rate of 67% in detecting AI-generated content. Neumann et al. suggest that ChatGPT has a fingerprint, a unique identifying factor. When evaluated in a situation and provided AI content alongside student content, teachers could not identify AI-generated content with a substantial level of accuracy (Fleckenstein et al., 2024). The exploration of this fingerprint may provide more valuable information on how, as Fleckenstein et al. (2024) suggests teachers could be trained to identify AI-generated content with more accuracy in the future. Cissnei stated that they could discern the student's voice and that the AI's voice was wooden. While Cissnei has hands-on experience with generative AI, although limited, Ellena does not. This exposes the question of how Ellena was sure that the content provided for an assignment was AI-generated. Upon investigation, it became clear that Ellena used Bloom's taxonomy when constructing

assignment briefs. Elsayed's (2023) findings of Bloom's taxonomy's effect on the output of a generative AI such as ChatGPT appear to confirm Ellena's experience through their approach to assignment creation.

The use of AI as part of an active pedagogy has not been fully explored. While this paper hopes to add to the conversation around this topic, the speculation around the use of AI as a roleplay participant Vashista et al. (2023) is confirmed in practice by Vincent, who engages in roleplay as part of the teaching and learning process with some students, Roy & Putatunda (2023) stated, they have engaged in this same process. However, they have done so with a focused approach to research. The findings in this paper expose the use of AI as a learning method used in active practice under the teacher's own initiative. The use of AI in the classroom is not limited to the example provided by Vincent. Reeves brings to light the impact that generative AI may have in relation to scaffolding, aligning with Neumann et al. (2023) Reeves first recommends having a conversation with students and informing them of the limits to which they can use generative AI. Vincent aligns with Neumann et al. (2023), who encourage students to engage with generative AI to establish the limits of the software. Reeves, however, cautions that not all students may have access to generative AI software in alignment with QQI's (2023) warnings.

Assisting students with making content more accessible is at the heart of UDL (CAST, 2024). Reeves demonstrated the technological connection and benefit that generative AI has by enabling students who found pre-assessment criteria challenging to complete. Reeves guided students on areas in which AI can be used to complete pre-requirements for assessment. Pearce (2024) has highlighted this as they have described teachers guiding the student's use of AI to aid students in completing their homework. Comparing this to the concept of scaffolding outlined by

Belland (2017) along with the focused categorisation outlined by Chen & Law (2016), this type of scaffolding could be considered soft scaffolding with respect to the aspects of collaboration and with the focus on completing a project. Central to the example in this paper, Reeves was an active member assisting the students while they used the generative AI software, ensuring that the content was valid and used when appropriate. Providing feedback to students is a recurring task for teachers. AI may assist in this area.

Generative AI can provide feedback (Pearce, 2024) quickly and at times when teachers may not be available. This can be seen in practice by Vincent's responses. Vincent goes a step further with their use of AI, where they engaged in reflective practice in collaboration with generative AI primed to act as a peer. Gathering feedback on classes that did not go well or that the teacher found did not play out as intended. Reeves does follow the suggestions of Pearce (2024) by using AI to provide feedback to the students. The feedback gathered from AI for students can help with their assignments. Teachers, on the other hand, use AI more commonly in a different way.

Vincent, Reeves and Don implemented some level of planning through the use of AI. Vincent found that the material that the AI provided was similar to their own, cherry-picked the best bits, and enhanced their own work. Reeves has also used AI as a starting point for lesson planning, using it as inspiration for new areas to explore. Don's experience focused on using AI to create lesson plans that, while they are better structured than the ones Don normally creates, the content was limited and uninspiring. Pearce (2024) and Muniasamy & Alasiry (2020) all suggest the use of generative AI as a tool to enhance learning through the use of personalised learning plans, but as seen from the experience of the teachers above, even

generating a single lesson plan, there are issues with the limited nature of the content, Vincent demonstrates that while the generative AI could generate a lesson plan it is in no way more robust then Vincent's own and experience. In this case, experience far outweighs pure data. Don's implementation was experimental and provided uninspiring results, and Reeves portrays the use of AI in this way as limited and in need of curation.

The use of generative AI in education is not going to go away anytime soon. Whether we as teachers wish it to be this way is no longer relevant, Pearce (2024) exposes students' adoption of generative AI. Generative AI, however, does not represent a replacement for teachers but rather another tool in their toolbox. One, which this paper has demonstrated, can be used in alignment with UDL to be implemented in the classroom through role play, gaining active real-time feedback, and being an active collaborator and scaffolding tool. While AI does not represent a one-size-fits-all tool, it may, however, represent a way in which teachers can facilitate a more student-centred approach to customising class engagement and activities through the use of an adaptive framework such as generative AI.

Of the findings presented in this paper, perhaps the most telling of the current situation when it comes to the adoption of technology and education is the apprehension around CPD. Two of these teachers presented with apprehension around the concept of CPD, while one of them was apprehensive of the use of CPD in a one-size-fits-all approach, "which applies basic irrelevance like butter to an entire staff" the other teacher provided a suggestion that CPD should be implemented in the same way that UDL is implemented for students. It is clear from these statements that historical CPD has left its mark on these teachers. This,

however, is the sign needed to improve CPD, making the content accessible to all at the time it is needed.

5.2 Links between UDL and AI

5.2.1 Engagement

One important element to remember when discussing UDL is the historical implementation of technology (Yuwono et al., 2023). The new introduction allows some key areas of UDL to be more readily approachable to students and more so for students who may find it challenging to discuss openly in a classroom setting. Feedback is a core element of UDL, as highlighted by Altowairiki (2023) who explains that feedback with multiple ways to receive this feedback is important. This was seen in Vincent's application of generative AI in the classroom, where generative AI was used as an active agent within the classroom. The AI can provide feedback to students, who then can act on and improve using this feedback. Altowairiki (2023) also acknowledges the need for students to choose how they engage in learning. Generative AI once again provides a way for this to be more actively placed under the students' control. These provide examples of how generative AI adds to the mode of engagement.

5.2.2 Action and Expression

Action and expression are perhaps the most fruitful areas in which, with the clever use of genitive AI, UDL can be enhanced. Action and expression encourage the introduction of new tools and assistive technologies. As such, the ability of generative AI to provide instant feedback and open back-and-forth communication, as seen with Vincent in class, is part of their approach to professional development.

Using tools to improve a script through iterations provided students with the opportunity to assess better and co-create with the use of generative AI, a more focused version of Reeves's approach conducted by Vicent.

5.2.3 Representation

Representation is one of the three modes of UDL. Representation can refer to the way in which information is displayed, clarifying information to make it more accessible (CAST, 2023). Representation can be enhanced by the inclusion of generative AI, which gathers information that may otherwise not be fully accessible to students at this time. In the example provided by Reeves, a student needed more assistance creating a simple, ungraded script. This script was not something that the student was readily able to do. As such, the student and Reeves created a simple script, and then the student edited the content in a way that still resulted in a valid assessment. This allowed the student to clarify meanings and supplied the background knowledge needed to create a script that the student had not acquired at that point.

5.3 Importance of TPACK

Throughout this research, the teachers demonstrated different skills and understandings of technology. Elena is perhaps the least experienced in the use of technology, and as such, their demonstration of TPACK is limited, which can be seen in their responses and lack of self-confidence in relation to technology. Their technology knowledge directly relates to how they implement these skills. Teachers like Vicent, whose knowledge of technology far surpasses many other teachers, have found new and exciting ways to incorporate new technology tools into their

classrooms. Vincent's proficiency in the use of technology compared to Elenas shows the importance of a grounding in preestablished frameworks such as TPACK.

5.4 Limitations

All research projects have limitations. This project is no exception, with the most critical limitation found within this project being the sample size. Saunders (2009) explains that the sample size for a project such as this is to contain five participants. The participants in this study constitute purposive sampling. Lærd Dissertation (2024) explains the limitations of using purposive sampling in a qualitative research project, suggesting that researcher bias could be an issue. As such, the positionality of the researcher has been outlined in order to provide context to the choices made. The sample size of five participants represents a limited number of views, providing insight into the situation.

This study is limited in its timeframe, and this research represents a cross-sectional study focusing on the early adoption of generative AI in further education. However, a longitudinal study may yield more robust results. The participants that took part in this study represent teachers within different disciplines, with each teacher providing vastly different understandings and engagement with generative AI. A more focused approach to each of these disciplines may provide more subject-specific data on the integration of generative AI.

5.5 Implications and Recommendations

Based on the commonalities between Elsayed (2023) and Ellena, who both found that the use of Bloom's taxonomy affected the success rate of generative AI's ability to produce coherent and valid results. Bloom's taxonomy should be considered when creating assessments. While it can often be an afterthought, with

only one of the teachers who took part in this study actively implementing Bloom's taxonomy, it is clear that grounding in good theoretical frameworks is a key element when addressing the introduction of generative AI into education.

While the discussion of generative AI's effect on academic integrity (Fleckenstein et al., 2024; Hinman, 2023; Neubauer et al., 2019) will not end anytime soon as AI improves, so will the discussion around the topic. Don states that the content generated is sub-par. All the teachers have in some way stated that they can detect the use of AI through evaluation of the work presented for assessment, with the AI-generated content not sufficiently addressing the tasks being asked of the students. This experience is contested in research by Fleckenstein et al. (2024) whose findings strongly suggest that teachers are unable to reliably ascertain if the content is created by students or by generative AI. Fleckenstein et al. (2024) suggests more studies in the area of reliably detecting AI-generated work, along with teacher training in the area. This paper would suggest that teachers reflect on their own understanding of AI, what they believe student work looks like, and the biases that teachers possess when evaluating work submitted for assessment.

Demonstrated in case studies by Roy & Putatunda (2023) supported by Vashista et al. (2023) and actively applied by Vincent. Role play facilitated the use of generative AI in the classroom and appears to be a viable and actively implementable use of generative AI in teaching and learning. It must be noted that the use of AI in such a way requires a facilitator, such as an educator, to be present to support students in setting up the generative software and collaborating in the analysis of the data returned to the students by generative AI. Teachers and students can benefit from the use of AI.

Vincent demonstrates a clear reflective practice of using AI to improve their workflow and better address issues within their practice, while Reeves suggests using AI as a tool in alignment with Pearce (2024) to help students get instant feedback when needed.

The demonstration in this paper of how AI can be used to plan class content while in alignment with the literature shows that no teacher in this study has found a meaningful, implementable way in which the generated content can be used for class structure generation. This limits the effectiveness of using AI across multiple students to create individualised lesson plans at this time. As such, while it is theorised by researchers such as Pearce (2024), Taneri (2020) and Muniasamy & Alasiry (2020) at this time, this research would not advise the use of generative AI in such a way without stringent and robust frameworks in place to ensure the validity of these lesson plans. As a result, the time-saving factor that many look to generative AI for is not present in this instance.

The true benefit of generative AI in teaching and learning may revolve around AI's use as an active agent within the classroom, assuming the role of an active participant in role-play scenarios, providing feedback, and engaging with students and teachers to improve their respective understandings of situations and expectations placed upon them.

5.6 Conclusion

Returning to the core question of this paper, "How are FE teachers in Ireland adapting to the introduction of generative AI in a UDL-enhanced classroom?"

The following can be established: teachers represent a varied group of individuals with their own skill sets and understandings of the emerging situation that

generative AI represents. Reeves and Vincent have embraced generative AI and have begun implementing it in a meaningful way in their active teaching and planning. Elena and Cissnei have explored AI to an extent and are currently experimenting with the new technology in order to find ways to improve their planning. Don finds the software to be lacking in all areas, making it a waste of time more often than not. While this provides no clear answer, teachers are adapting to the new software and are implementing it in ways that best suit their needs.

The sub-question of, how do FE teachers in Ireland view the introduction of generative AI in a UDL-enhanced classroom? It proved to be more nuanced than first had been expected. While all the teachers expressed some level of affectation around the subject, they all perceived the benefit that it could bring. This came with a warning of how and when to use the software, that political, historical, or current affairs could not be trusted, and that users need to be aware of a bias within the generative AI software. The final question is: How are teachers using AI in a UDL-empowered classroom? Can be seen through different scaffolding methods by both Vincent and Reeves and as a role-play agent with Vincent. This can provide new areas of interest for other researchers to explore; not only does generative AI have the potential to make classrooms more engaging and provide support to students who need it most. These teachers and methods have demonstrated that there may be much more to explore and develop. The world of generative AI is only beginning to be explored.

5.6.1 How do these findings affect the researcher?

As an active teacher, I am aware that the findings in this paper have brought to light new ways in which content can be presented to students. Vincent's methods

of using generative AI as a roleplay agent showcase a way in which learning can be made more interactive and, thus, more engaging for students. It is a method that the researcher will implement in the coming academic year. The experience of Elena backed up by the research of Fleckenstein et al. (2024) and reminding and reinforcing the importance of theories such as Bloom's taxonomy will be more present in creating future assessments.

5.6.2 How do these findings affect colleagues*?*

From the experience of Reeves and Elena it can be seen that students are engaging with generative AI supported by Pearce (2024) there is no longer any time to avoid this topic. Generative AI is being added to many software and will become a default addition to Windows PC in the future. Teachers need to adapt. This paper provides context to the current situation and provides examples of how generative AI can be better used to help students; this paper is by no means a one-and-done document for generative AI but can be used as a starting point to begin adapting practice in an AI-empowered world.

5.6.3 How do these findings effect policy?

The findings in this paper show the varied skills and understanding of the teachers. They are vigilant and adapt to new and emerging situations at all times. The policies relating to generative AI are still being developed. There needs to be more guidance. This document does not assume the role of creating and suggesting what policies to make. This research demonstrates the commitment that teachers have to make teaching and learning better for their students and should be provided with the opportunity to have valid and valuable CPD when and where needed, as expressed by Don and Elena.

This research represents a small sample size of only 5 participants, conducted during the first few years of publicly available generative AI. This does not represent the experience of every teacher and how AI is affecting their practice. This research has been focused on further education in the east of Ireland. More research needs to be conducted in other areas and institutions, focusing on how AI can be used to enhance teaching and learning. Much of the literature focuses on using AI in a way that helps plan, assess, or track students when the focus should shift to helping and guiding students. AI as a tool can be limited in academic circles. However, once students leave those circles, AI represents a tool that can be used, so instead of limiting the use of AI in academic circles, AI should be used in a meaningful way that encourages lifelong learning.

The research in this paper can provide a grounding in which to build upon key areas that have been explored, such as role play implemented with AI exploration into this area, which may improve the way in which students can collaborate with such software. The limited success of AI in creating lesson plans, as experienced by these teachers, is something to be mindful of. While suggested by many researchers, AI is not yet ready to create individualised personal lesson plans. Teachers are fallible to our own inherent biases, and it cannot be understated that AI can go undetected in written work. While teachers may feel that they can reliably detect it, there is empirical evidence (Fleckenstein et al., 2024) that they cannot reliably do so, and more research needs to be done on how this can be remedied. If AI is to be used meaningfully in education, it must be done in a controlled manner, one in which the teacher can reliably ascertain where and when AI was used and ensure integrity throughout the entire learning process.

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Appendix

Appendix 1: Plan Language Statement

Information sheet

Introduction to the research study

The working title for this research study is "The Current Accepted Use of AI in Further Education, from a Teacher Perspective, and How to meaningfully implement AI into the Classroom to Provide a deep learning experience." It is being conducted as part of a master's in educational practice under NCI with the Supervisor, Michael Goldrick (michael.goldrick@ncirl.ie). Michael Carstairs is undertaking this research study (X21228191@student.ncirl.ie).

Details of what involvement in the research study will require

This study will involve participation in a 40 – 60-minute interview.
This interview will take place in the BIFE main building / over teams with a preference for teams and will be recorded and later transcribed.
The transcript of the interview will be provided to the participant to ensure that the content correctly represents the views and intended meaning of the participants' responses. After the interview, this transcript will be provided within a week. Participants who do not respond within a week will be considered to have accepted the transcript unless otherwise expressed at a later date.
The transcription after acceptance will be subject to a thematic evaluation. After this is completed, participants will again have an opportunity to provide input and clarify any possible miscommunication.

Potential risks to participants from the involvement in the research study.

It is not envisaged that you will encounter any risk arising from involvement in the research study greater than that experienced in everyday life.

Benefits (direct or indirect) to participants from involvement in the Research Study

You may benefit from this study by reflecting on your own experience with AI and evaluating possible areas of involvement in your everyday workflow. This study aims to provide more content for AI's current situation and acceptance within higher education. Key findings from this study will be communicated to you via e-mail.

Advice as to arrangements to be made to protect data confidentiality, including that confidentiality of information provided is subject to legal limitations.

Every effort will be made to respect your anonymity. The data collected will be analyzed by the researchers alone. Participants will be identified by number (e.g., Participant 1, 2, 3, etc.) on audio recordings and written transcripts. Any identifying information disclosed during the audio recordings will be de-identified in the written transcription. Interview recordings will be separately stored from transcripts using a secure password-protected One Drive account. Transcripts will be stored in a college-supported password-protected folder in One Drive. All data is collected and stored in compliance with GDPR.

Advice as to whether or not data is to be destroyed after a minimum period

The current guidelines within NCI state that all data will be destroyed after five years. Until now, transcripts will be stored online, securely password-protected on one drive.

Statement that involvement in the research study is voluntary

Participation in the research study is voluntary, and you may withdraw from it at any point without any penalty.

Any other relevant information

All participants in the study will be teachers or persons in management positions in further education.

If you have any concerns about this study and would like to contact an independent person, please contact:
National College of Ireland Research Ethics Committee EthicsSubCommittee@ncirl.ie

Appendix 2: Consent Form

Consent Form

Research study title

The study you are invited to participate in has the working title: "How do further education teachers in Ireland adapt to Generative AI in a UDL-empowered environment?" It is being undertaken as part of a master's research project under the supervision of the National College of Ireland.

1. Purpose of the research

The study aims to advance the current understanding of how teachers within further education adapt to the introduction of Artificial Intelligence programs such as ChatGPT.

2. Confirmation of Particular requirements as highlighted in the plain language Statement.

As stated in the plain language statement,

3. Participant – please complete the following (Circle Yes or No for each question)

Have you read or have you read the Plain Language Statement? Yes/No?
Do you understand the information provided? Yes/No
Have you had an opportunity to ask questions and discuss this study? Yes/No
Have you received satisfactory answers to all your questions? Yes/No
Do you agree to have your interview audiotaped? Yes/No
Do you agree to have anonymized quotations from your interview used in the study report? Yes/No

4. Voluntary participation

Your involvement in the study is entirely voluntary. You may withdraw from the research study at any point. There will be no penalty for withdrawing before all stages of the research study have been completed.

5. Arrangements to protect the confidentiality of data

Every effort will be made to respect your anonymity. The data collected will be analyzed by the researchers alone. Participants' actual names will be protected, and fake names will be used if direct references are required. Interview recordings and transcripts will be held by the researchers and stored in a secure location.

6. Signature

I have read and understood the information in this form. The researchers have answered my questions and concerns, and I have a copy of this consent form. Therefore, I consent to take part in this research project.

Participant's Signature:

Name in Clock Capitals:

Date:

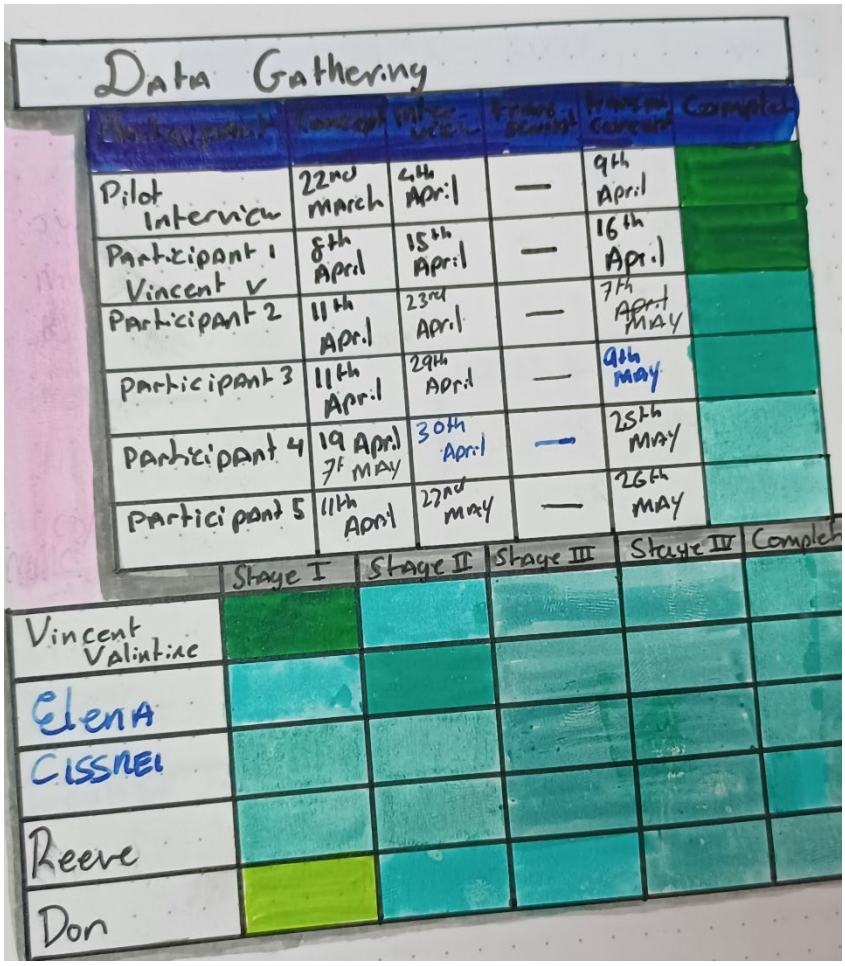
Appendix 3: E-mail Recruitment E-mail

Dear Teacher,

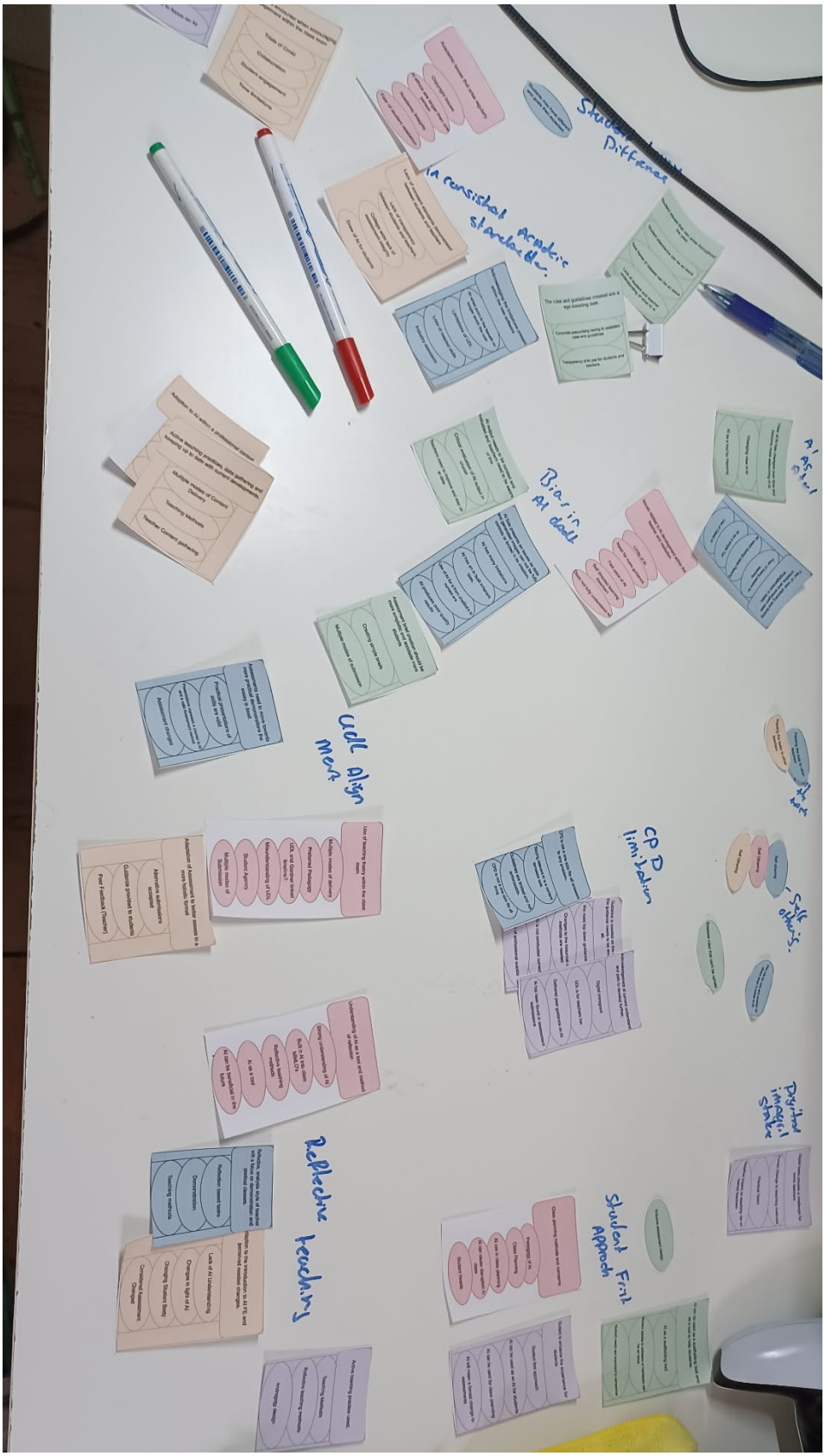
Thank you for agreeing to participate in the study: "How do further education teachers in Ireland adapt to Generative AI in a UDL-empowered environment?"
The consent form and the attached plain language document offer detailed information related to the project. I would be grateful if you could read this documentation and reply with any queries at your convenience.
All questions can be directed to X21228191@student.ncirl.ie (Michael Carstairs) or to michael.goldrick@ncirl.ie should you require to speak to the researcher's assigned supervisor.
If you do not have any questions, I would be grateful if you could complete sections 4 and 7 below and return the consent form by email to X21228191@student.ncirl.ie.

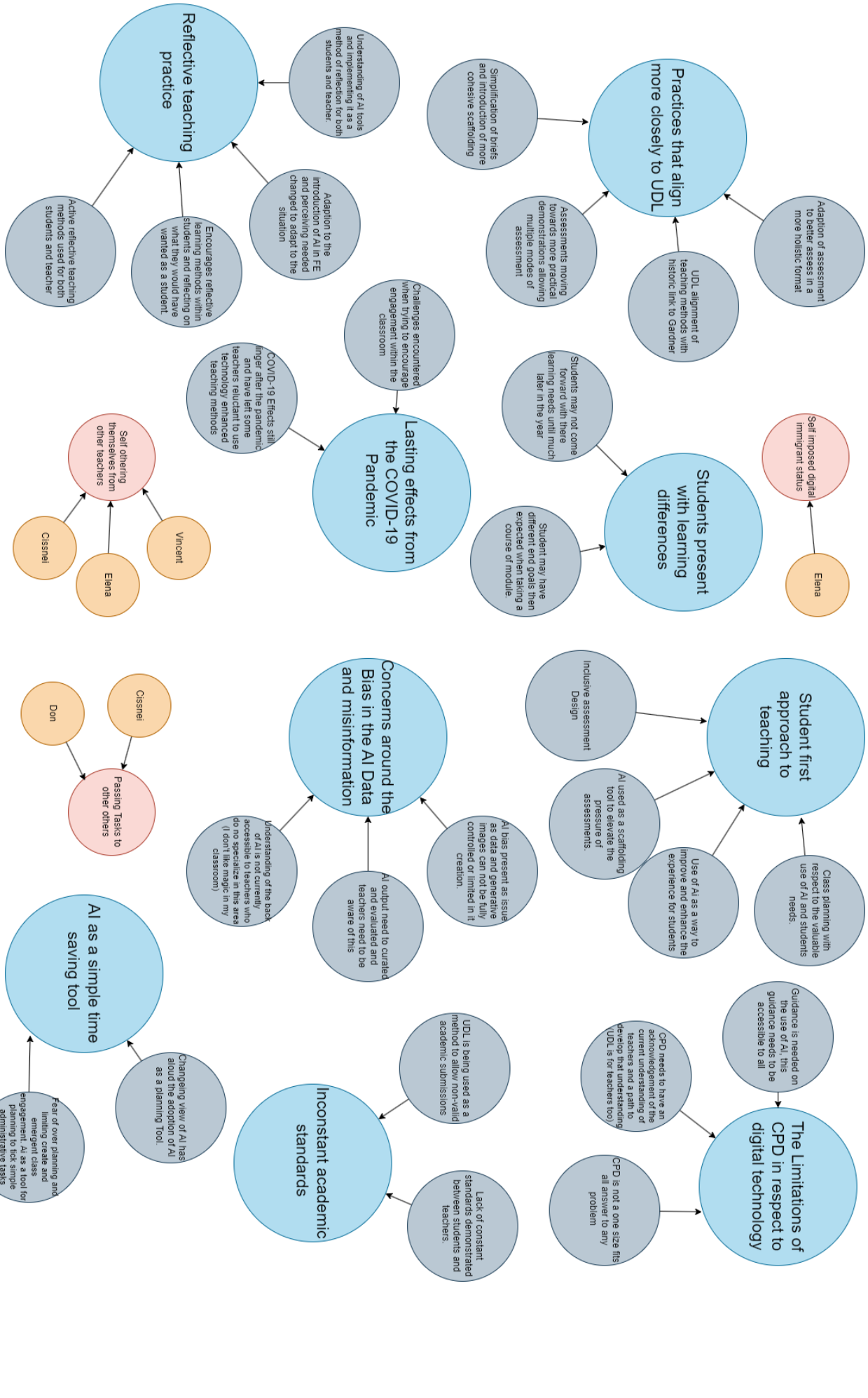
Kind Regards,
Michael Carstairs.

Appendix 4: Data Gathering Timeline



Appendix 5: Grouped Experiential Themes




Reflective teaching practice
Understanding of AI tools and implementing it as a method of reflection for both students and teacher.
Adaption to the introduction of AI in FE and perceiving needed changed to adapt to the situation
Encourages reflective learning methods within students and reflecting on what they would have wanted as a student.
Active reflective teaching methods used for both students and teacher
Practices that align more closely to UDL
Simplification of briefs and introduction of more cohesive scaffolding
Assessments moving towards more practical demonstrations allowing multiple modes of assessment
UDL alignment of teaching methods with historic link to Gardner
Adaption of assessment to better assess in a more holistic format
Lasting effects from the COVID-19 Pandemic
Challenges encountered when trying to encourage engagement within the classroom
COVID-19 Effects still linger after the pandemic and have left some teachers reluctant to use technology enhanced teaching methods
Self othering themselves from other teachers
Cissnei
Elena
Vincent
Students present with learning differences
Students may not come forward with there learning needs until much later in the year
Student may have different end goals then expected when taking a course of module.
Self imposed digital immigrant status
Elena
Student first approach to teaching
Inclusive assessment Design
AI used as a scaffolding tool to elevate the pressure of assessments.
Use of AI as a way to improve and enhance the experience for students
Class planning with respect to the valuable use of AI and students needs.
Concerns around the Bias in the AI Data and misinformation
Understanding of the back of AI is not currently accessible to teachers who do no specialize in this area (I don't like magic in my classroom)
AI output need to curated and evaluated and teachers need to be aware of this
AI bias present as issue as data and generative images can not be fully controlled or limited in it creation.
Don
Cissnei
Passing Tasks to other others
The Limitations of CPD in respect to digital technology
Guidance is needed on the use of AI, this guidance needs to be accessible to all
CPD needs to have an acknowledgement of the current understanding of teachers and a path to develop that understanding (UDL is for teachers too)
CPD is not a one size fits all answer to any problem
Inconstant academic standards
UDL is being used as a method to allow non-valid academic submissions
Lack of constant standards demonstrated between students and teachers.
AI as a simple time saving tool
Changeing view of AI has aloud the adoption of AI as a planning Tool.
Fear of over planning and limiting create and emergent class engagement. AI as a tool for planning to tick simple administrative tasks

Appendix 6: Example of exploratory notes

Vincent

And I have to say, in my practical experience in the ground, that is not possible, or at least it's not possible in at a granular level. — *Does not belive that Individual learn plans are possible*

It takes quite a while to get to know the students

Quite often they are not forthright and forthcoming with difficulties that they have. — *Students are reluctant to give relevant Information*

They don't want to share their problems and their difficulties.

They're trying to overcome them themselves and maybe they'll reach out for assistance later in the year or they'll tell you that they have a problem with their hearing or have a problem with XYZ later in the year.

But it's very difficult and it's ever evolving.

So having if I have over 100 Students having 100 individually tailored Learning plans is not really a practical approach to teaching. — *possible overload of students*

So what do I do instead?

So to answer your question directly, umm so I try and build into the projects that I am delivering and as many options as possible for the student. — *multible modes of delivery.*

So I will give them the option of delivering material that is, there could be a instead of writing an essay that could write that essay if they wanted, they could do a presentation instead of it. — *essays, presentation, Audio recording, possible students' suggestion, [illegible] connection*

They could give an audio recording.

They could so, and I'm completely open to a suggestion that they might have of a medium that I'm not familiar with.

So we have students who do video essays with like directors, commentaries. — *video essay*

We have all sorts of ranges of how it returns to me in terms of my own delivery and pedagogy. Umm. — *Confusing needs to focus on what is meant here.*

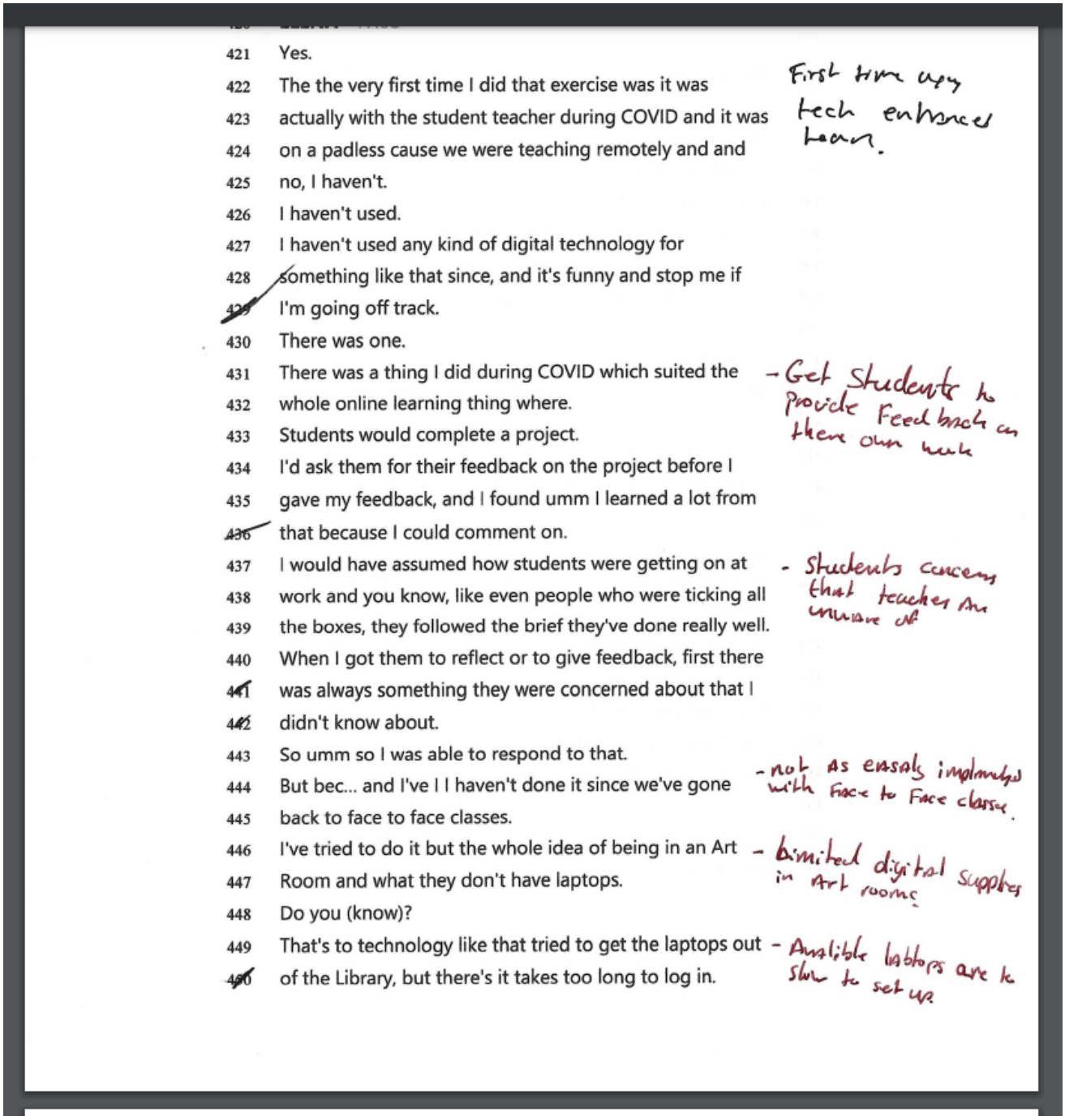
I I suppose I I try to be as diverse as I can and it is very difficult though, so I said I record a video umm for most classes and I normally give the Students my.

My my plan at the start of the year so that the the most, most teachers hide.

So like I give them my sort of my my, my Lesson plan so that they have an idea of what's coming up. — *Students can choose to have Agency in their own work*

So the students have sort of they they can move ahead if they want, umm

Elena



421 Yes.
422 The the very first time I did that exercise was it was
423 actually with the student teacher during COVID and it was
424 on a padless cause we were teaching remotely and and
425 no, I haven't.
426 I haven't used.
427 I haven't used any kind of digital technology for
428 something like that since, and it's funny and stop me if
429 I'm going off track.
430 There was one.
431 There was a thing I did during COVID which suited the
432 whole online learning thing where.
433 Students would complete a project.
434 I'd ask them for their feedback on the project before I
435 gave my feedback, and I found umm I learned a lot from
436 that because I could comment on.
437 I would have assumed how students were getting on at
438 work and you know, like even people who were ticking all
439 the boxes, they followed the brief they've done really well.
440 When I got them to reflect or to give feedback, first there
441 was always something they were concerned about that I
442 didn't know about.
443 So umm so I was able to respond to that.
444 But bec... and I've I I haven't done it since we've gone
445 back to face to face classes.
446 I've tried to do it but the whole idea of being in an Art
447 Room and what they don't have laptops.
448 Do you (know)?
449 That's to technology like that tried to get the laptops out
450 of the Library, but there's it takes too long to log in.

First time using tech enhanced learn.

- Get Students to Provide Feedback on their own work

- Students concerns that teacher has unaware of

- not as easily implemented with Face to Face classes.

- limited digital supplies in Art rooms

- Available laptops are to slow to set up

Cissnei

So it's there for the students.

Michael Carstairs 4:51

Cool.

And then when you're planning classes, do you implement any like technology enhanced teaching in your classes by default?

CISSNEI 5:01

Well, I suppose having everything online is technology enhanced.

Now I do everything through teams, all assignments through teams, all notes through teams.

I get them to use the collaboration space sometimes in a class where I get them to do something and then they put it up in real time.

They find that a bit to disorientation, because if I have it on the screen, they're like you can see me type it.

So that that is good in a way because you know if you get them to work in groups, then the person typing isn't the one who came up with the idea kind of thing, you know?

So it gives them a little bit of confidence.

Umm.

Sometimes they'll take photos and put it up or something like that.

It's kind of what they're comfortable with as well.

Put some of my modules they have to collect data so then they can collaborate on the data.

That way you know I I say to them, you're doing your own write up, but if you want to do this together, the data analysis, that's absolutely fine.

We cannot do it in the class notebook in the collaboration space and then it's there for everyone.

Michael Carstairs 6:00

OK.

And would you use any tools like Kahoot, WordWall, any of those kind of online?

- use of teams as an online learning platform
- online collaboration
- can cause some level of confusion for students
- ~~peer~~ working in groups helps with potential shyness
- use of photo upload
- what students are comfortable with
- peer collab encouraged for some tasks
- Digital record of tasks & Progress

Reeves

backgrounds. I think one of the things before I get into that, one of the things that is difficult at the start of the year is for teachers. Sometimes it's you're not always aware of what certain students needs are. I mean, sometimes students would submit to the college what they're learning needs are and if they need special requirements. Sometimes it's an issue that might arise be passed on to the teacher. So sometimes you can spend five or six weeks before it becomes.

You know, apparent to you.

That a student needs.

Different approaches. So I think the key for me with with udl is that so delivering delivering your material in lots of different ways.

Find something that various students are comfortable with, because not everybody is comfortable with with certain things, and then also what's very important is as well as delivering it in as broad a term as possible to try to ensure that you have diverse sort of ways that students can submit, can submit their assignments.

Like some people struggle with maybe words depending on what it is, so you have to, you know, give people an opportunity where they can speak and and you can record that as part of the submission also video.

I find that's very useful as well, but then again, some people just climb up on camera and don't want to be recorded, so it is about sort of introducing all of that. And I'm hopeful that I know we've moved away from AI a little bit. I think AI will offer even more ways that we can sort of, you know.

Referred to our students and also to assess them as well.

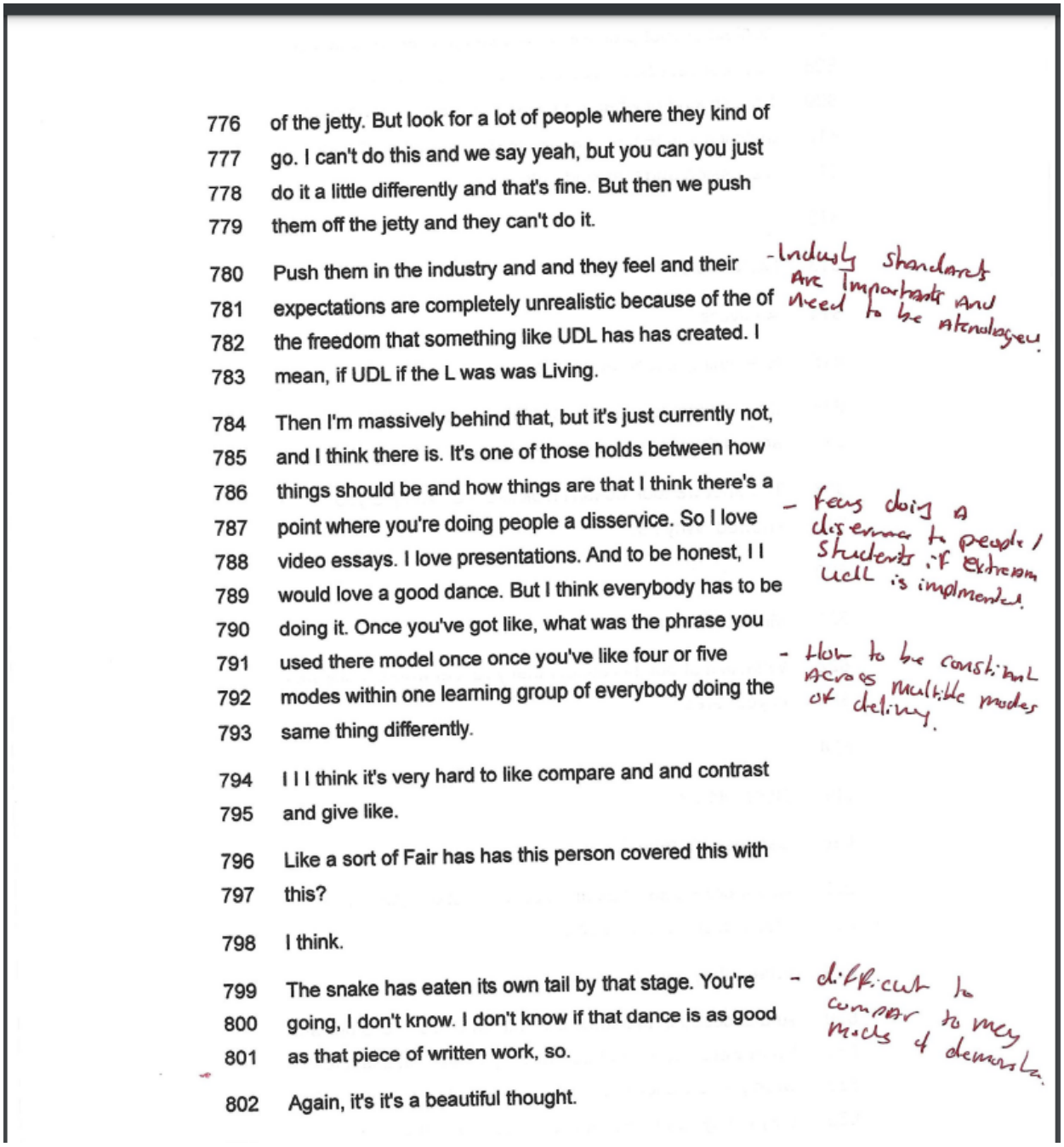
Michael Carstairs 26:06

Cool. And then?

What do you envision that looks like with AI? So how can you help them with assessments?

- Lack of clarity of student needs from start of the year.
- Can take time for info to become apparent
- Multi modal approach
- Finding student comfort level + learning Preference.
- Avoiding modes that are more difficult
- written, spoken, video submission.
- Sees AI as another possible tool
- Assessing with AI? Should

Don



776 of the jetty. But look for a lot of people where they kind of
777 go. I can't do this and we say yeah, but you can you just
778 do it a little differently and that's fine. But then we push
779 them off the jetty and they can't do it.

780 Push them in the industry and and they feel and their
781 expectations are completely unrealistic because of the of
782 the freedom that something like UDL has has created. I
783 mean, if UDL if the L was was Living.

- Industry standards are important and need to be acknowledged.

784 Then I'm massively behind that, but it's just currently not,
785 and I think there is. It's one of those holds between how
786 things should be and how things are that I think there's a
787 point where you're doing people a disservice. So I love
788 video essays. I love presentations. And to be honest, I I
789 would love a good dance. But I think everybody has to be
790 doing it. Once you've got like, what was the phrase you
791 used there model once once you've like four or five
792 modes within one learning group of everybody doing the
793 same thing differently.

- Fears doing a disservice to people / students if extreme UDL is implemented.

- How to be consistent across multiple modes of delivery.

794 I I I think it's very hard to like compare and and contrast
795 and give like.

796 Like a sort of Fair has has this person covered this with
797 this?

798 I think.

799 The snake has eaten its own tail by that stage. You're
800 going, I don't know. I don't know if that dance is as good
801 as that piece of written work, so.

- difficult to compare to many modes of demonstration.

802 Again, it's it's a beautiful thought.

Appendix 7: Deeper Analysis of Transcripts

Vincent

Line Number(s)	Comments
24	Consent was established again, ensuring that the participant was willing to engage in the study, be recorded and have their transcript used for the project.
60	Participant established that most of the AI used in their classes is generative AI.
63-65	Vincent made a clear distinction between generative AI and traditional AI. He highlighted the historical use of generic AI and algorithms in software such as YouTube. Discusses generic AI about YouTube and Google.
73	Using AI to generate a script gives the theme parameters a basic plot. This is used as a time-saving process.
77	The Generated content would be evaluated, reflecting on the material; this may promote critical evaluation of the script, looking for errors or other areas of improvement.
81-84	Vincent would prompt the AI to take on the role of a chatbot with the parameters of "You're a film producer, and I am pitching you a film". This Links with roleplay as a pedagogical approach; however, Vincent did not highlight it. Was this an omission or misunderstanding of the situation?
85-86	Vincent highlights that the AI would be prompted to ask "us" questions in response to the script; this simulates social interaction with a computer system. This could represent a link to social engagement for otherwise unconfident students.
88-89	Vincent shows a strong understanding of prompt creation within the AI, a skill in its writing, and the experience Vicent has with the software. Vincents prompt commands the ChatGPT to wait until the user responds to each question before continuing the process.
90-91	At the end of the conversation with the AI, Vincent asked the AI to tell the user whether or not it would produce the film the group created. AI provides feedback to students. However, Vincent oversees this feedback.
92-94	Vincent uses the AI to generate feedback on a pitch, presentation, image, or idea. This is to gain interactive feedback. This feedback is used alongside input from the teacher and represents another mode of input for students to improve their skills without fear of social impact.

Elena

	knowledge this participant has regarding AI. They have limited knowledge and exposure.
207-208	Participants have experienced students using AI in the classroom. This is related to the time of the year for this participant. This was conducted at the end of year corrections time of year.
232-	When planning a class, the participant researches the topics to be covered, exploring elements such as the historical context of the core subject at the historical period being studied.
236-	We are focusing on the different movements linking them to political or social issues in the historical period. This historical context appears necessary for this teacher when researching the subject with a more holistic approach to understanding a topic.
245-	Participant focuses on reflective learning principles. They are building into their classes the concept of critically thinking about the historical implementations of the different movements throughout history and building students' skills in understanding and recognising the impacts.
248-	We are focusing on building a clear line between the current tasks within the class and the later implementation of these skills in later lesions.
252-	The participant presented information to the students using PowerPoint. This is enhanced by the use of in-class exercises to encourage students to interact with the theory and topics covered.
259-	Practical classes take on a different approach, where an art element would be established, consideration of the class group's primary discipline. Creative connections to the core subject are then established. This is then uses a constructivism approach building on the previous knowledge of the group and building on the previous lesion.
270-	Curating content, resources, and class-specific content are essential, as well as bringing examples of artists and practitioners in the area.
276-	Participant provides scaffolding to the students; this is implemented through the use of in-class exercises.
294-	Participants work to encourage class engagement, trying different methods of engagement depending on the class group.
298-	Participants reflect on their lessons based on their conversations with the students. These conversions include the topics they are covering in other modules. The participant then tries to align their class content with the content of their different modules.

Cissnei

Participant 3: Cissnei: Deep Analysis

Line No.	Details
110-111	Cissnei has historical notes that they use for class preparation.
114-115	Cissnei e-mails themselves new or interesting articles that they find keeping a digital log of new and emerging information.
118-121	Cissnei has classes that focus heavily on theory. These classes do not change much, and historical documents are valid. New articles are more common for other classes, such as sport-based subjects.
122-125	Adding content specific to class groups is important to this teacher. Try to create content or interest for each class group.
126-128	Building on past notes is noted; however, checking and verifying the links is important as part of the class preparation.
129-130	PowerPoint is used as a central hub for hyperlinks, as well as a notebook as the main hub for students to have content.
139-141	Views using a notebook and having many documents online as technology-engaged learning.
142-143	The use of collaboration software is used in class; this is software where the information is updated in real-time.
144-145	Cissnei has noted that some students find this set-up disorienting. Because the data is being updated in real-time on the screen
146-149	This is good for getting students to work in groups, where one group member is designated as the script, resulting in other members of the group feeling less pressure and or limiting the student's ego.
151-152	Uploading images is also used with this software.
153-156	For some modules, students must collect data and analyse

Reeves

112-116	Ensuring class content aligns with the learning outcomes is critical in preparing for a class. This has been a historical issue, and teachers have taught the wrong module until Christmas.
121-128	Introducing variety into the assessment process and making it as inclusive as possible is crucial for further education. This will assist as many students of a diverse student cohort as possible.
129-130	"Be inclusive as we can when it comes to assessment."
142-143	Reeve has historical content that they can call on when planning a class.
144-151	Remember that some content can quickly become outdated when gathering new content for classes. AI is increasing the speed at which content is becoming obsolete.
153-157	Reeve draws on information from multiple locations, including Trinity and UCD, as they can access resources and alums from both colleges.
165	Reeves has used AI as part of a class planning process.
172-180	A student needed to perform a skills demonstration and found completing a non-graded part of the task difficult. Reeves encouraged them to use AI to assist with the non-graded elements of the task and build confidence.
182-186	The use of AI within assignments is explained to the students in detail and outlined in assignment briefs.
196-197	The use of AI should be done so with caution; using it verbatim is "dangerous".
198-203	AI is a valuable resource, and ignoring it would not be wise. AI can be used as a feedback tool to point out areas of weakness or areas to improve.
228-234	Students submit work via Audio recording, video Recording, presentation format and traditional formats.
235-237	Some people find video submissions terrifying, while others find different formats more accessible. Reeves has a clear focus on fairness.
246-247	The use of Padlet has been acknowledged but linked to AI; This may showcase confusion about what Padlet is. Once again, it highlights that AI is developing quickly.
248-251	AI is developing software and needs more time to be fully developed to meet the class's needs successfully

Don

	engaging in.
70-75	They do not want to become unpleasant; their view of this appears to be one of small stature and limited joy in life, with limited, repetitive and uninspiring classes.
78-80	They do not want their passion to die, and this appears to be a driving factor for this person.
84-86	Overplanning comes with the apprehension of that past teacher(s) experience. As a result, planning has become a necessary task.
87-89	Classes are planned to be loose in structure. With a topic to be covered with limited presentation. Close to chaos
91-93	Strict structured planning has been done in the past. Classes with an A to B to C structure often deviate from the planned structure. This results in the belief that these plans have little to no merit.
97-99	Personal plans are simply a backup plan for when a teacher is sick or unable to attend their class. (is a task to make them replaceable)
102-104	Industry experience is not a requirement for teachers; you only need to be two pages ahead of the class to be a teacher.
105-110	AI was used as a test to complete some class plans; the plans were more structured than the ones completed by the teacher.
111	"I'm easily replaceable."
112-115	AI can help with the basic class planning elements. The simple tasks like class plans.
139-140	There are two ways of not thinking about things; the overplanning way is one of them. Does not believe in Chalk 'n' Talk.
144-145	I am really passionate about the topics and skills that they teach.
146-149	They engage in active elements that they find engaging, such as taking part in competitions.
150-155	Focusing on class content that they would have enjoyed as a student, entering competitions and other real-world experiences.
157-158	Creating and implementing class content that excites them as a teacher, keeping it fresh.
160-165	Outcomes are easily covered; the main focus of the learning outcomes is to give them meaning.
166-168	Giving students a clear goal, the assignment aligns with a competition, given the task's real-world relevance.
176-183	The class content is uncertain in relation to video content. With the emergence of

Appendix 8: Experimental Statements (Individual)

Vincent

Vincent: Statements

AI is used during class to generate content
There is an apparent distention between Generative AI and traditional AI.
AI is used to generate scripts provided with the theme and central plot line. Students would then reflect on and look for areas to improve.
AI would take on the role of a film producer and engage in a question-and-answer session with the students related to a script created by the students. At the end of the session, the AI would agree or reject making the film.
Using Gen AI on the pitch, presentation, and image feedback allows students to gain active real-time feedback when a teacher is absent. The teacher also provides feedback at stages throughout the project.
A level 6 module has AI built into the MIMLO. This module is taught over six weeks at 8 hours a week, making time a limiting factor.
When creating a class, "What am I learning?" and what the students are trying to learn from this session are key driving factors.
Working backwards from the end goal and evaluating where AI can help achieve the goal. Ai represents one of many tools used to curate classes.
AI can help only in specific circumstances. There may not always be an AI that can help.
AI is used to help free up time, providing formative feedback to students where appropriate. The teacher then assesses this feedback to ensure correct feedback is provided.
Reflected teaching methods are used in connection with AI. Students would get

Ellena

been used since.
They have implemented an alternative feedback system, tasking students to provide feedback on their assignments and revealing areas of concern they were unaware of.
Technology-enhanced learning is complex due to limited resources and time limitations.
Student digital literacy can play a factor in planning to use technology-enhanced learning.
Even in a class with digital natives, they are reluctant to use technology-enhanced learning.
The use of technology during COVID-19 was a horrible experience, and a lack of belief in one's skill contributed to the lack of Technology.
They feel they can use their own devices, but helping students with them would be complex.
Helping students with digital elements can sometimes feel forced as the submission rules move them. For the folders to be EV'd
In the past, the aid of another outside teacher has resulted in good resources. And class demonstrations of the use of technology for EV submissions; however, the idea of doing this independently is still a concern. It is unfair for students to be expected to complete this task.
Some digital skills are assigned as tasks.
Students who are not native English speakers can have vastly more skill in written English. However, some work submitted this year is believed to be AI-generated

Cissnei

class time.
Audio submissions as part of the assessment.
Students often promise to complete work but fail to do so. This has been helped at times by the introduction of UDL methods.
Consideration has been given to changing all assessments to align with UDL principles through Notebook. However, written feedback is preferred. Audio recording feedback would take too long.
Some students prefer to write notes by hand, while others prefer digital formats; the teacher provides all teacher notes early to allow students to prepare for class.
PowerPoint is used to provide students with notes and links to relevant content.
The background of this teacher is different from that of other teachers; students may consider the classes a step from other courses, encouraging self-directed learning.
There are limited resources at the FE level for class content.
Establishing the abilities and skills level of the class is essential; two classes of the same module may have vastly different capability levels.
Traditional approaches are preferred when content change is warranted.

Reeves

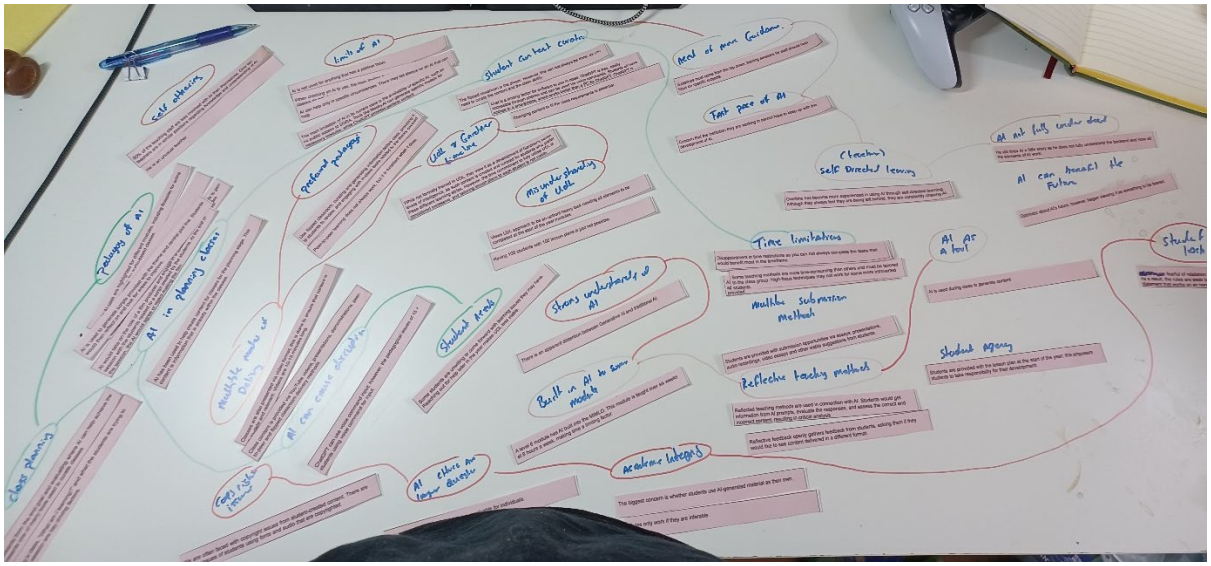
Assessment methods should be as inclusive as possible. They are making the assignments as accessible to as many students as possible.
Maintaining up-to-date content is complex with the introduction of AI. AI is improving at an exponential rate.
Drawing on historical content and gathering resources from multiple institutions provides a solid grounding for content development.
AI has been used in class planning, such as lesson plans.
Students have been permitted to use AI for non-graded elements of assessments, such as writing a script for a presentation where the presentation skills were marked. Students are directed to the acceptable use of AI in evaluations.
AI should not be used verbatim as a research tool; however, it can be used as a feedback tool to point out elements to improve within writing.
Submissions are accepted via Audio recording, video recording presentation and transition formats.
Assessment methods should be curated for the students, as some may be uncomfortable using recorded submissions.
The technology used in the classroom, such as Padlet "may" confuse the students.
AI software has not been developed with academic skills in mind. As such, they do not always meet the needs of the classroom.
Student access to AI software is a huge concern. Some students may not have access to the internet, and as such, AI is not a valid resource for them.

Don

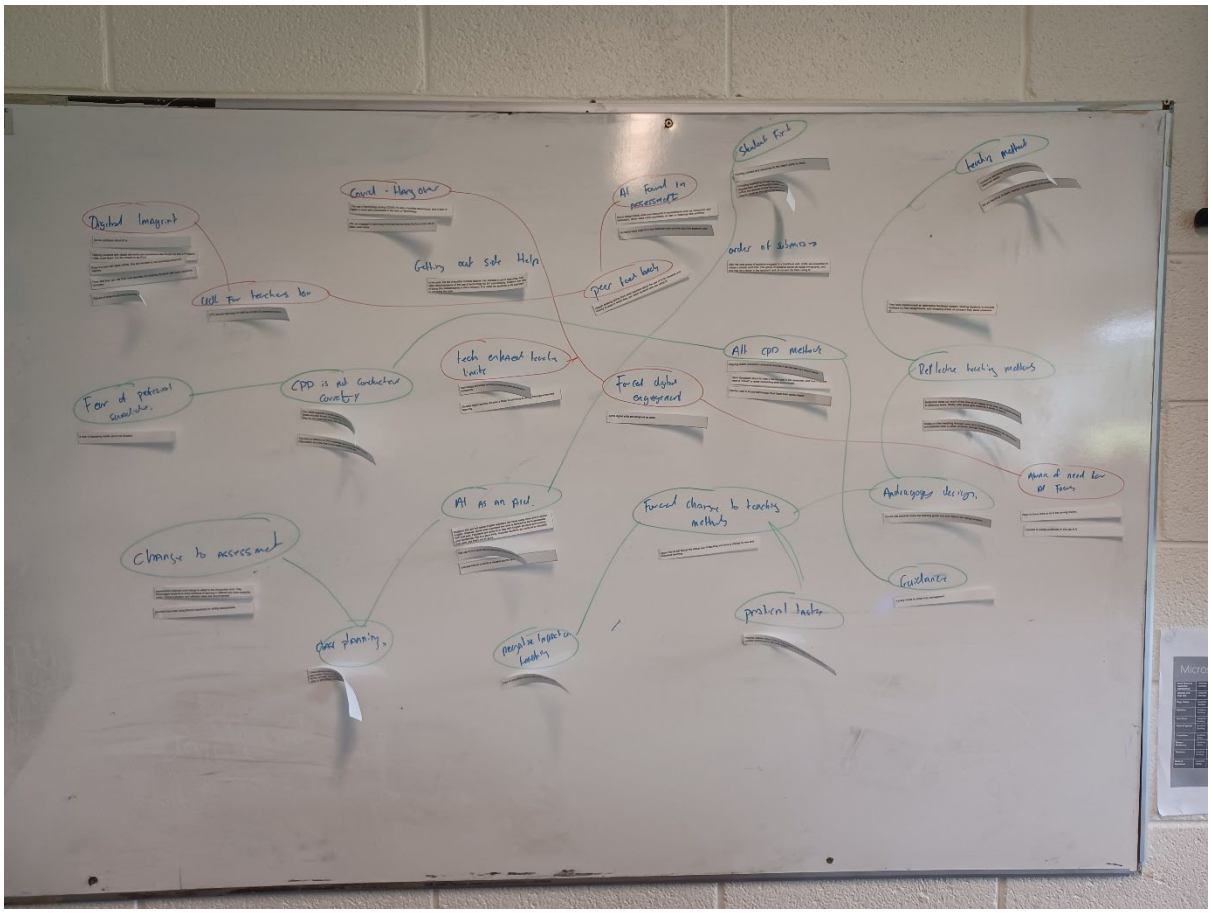
They fear losing all their passion for their work and do not want to become unpleasant, repetitive, or uninspiring.
Overplanning can lead to a negative self-image and lack of joy within their work.
AI has made them replaceable for administration tasks such as class planning.
AI has its limits on how much it can help a teacher.
Focus on practical demonstrations of skills and teaching methods.
They are passionate about the area in which they study.
Active teaching methods that focus on building skills with practical elements and hardware.
Classes are constructed based on the content they would have liked to engage with as a student.
Learning outcomes are quickly covered when constructed around a clear goal, such as a competition.
Creating engaging classes is uncertain in a world of short-form videos.
Keeping up with the latest industry changes is essential. Doing this is a thankless task.

Appendix 9: Connecting Individual Themes

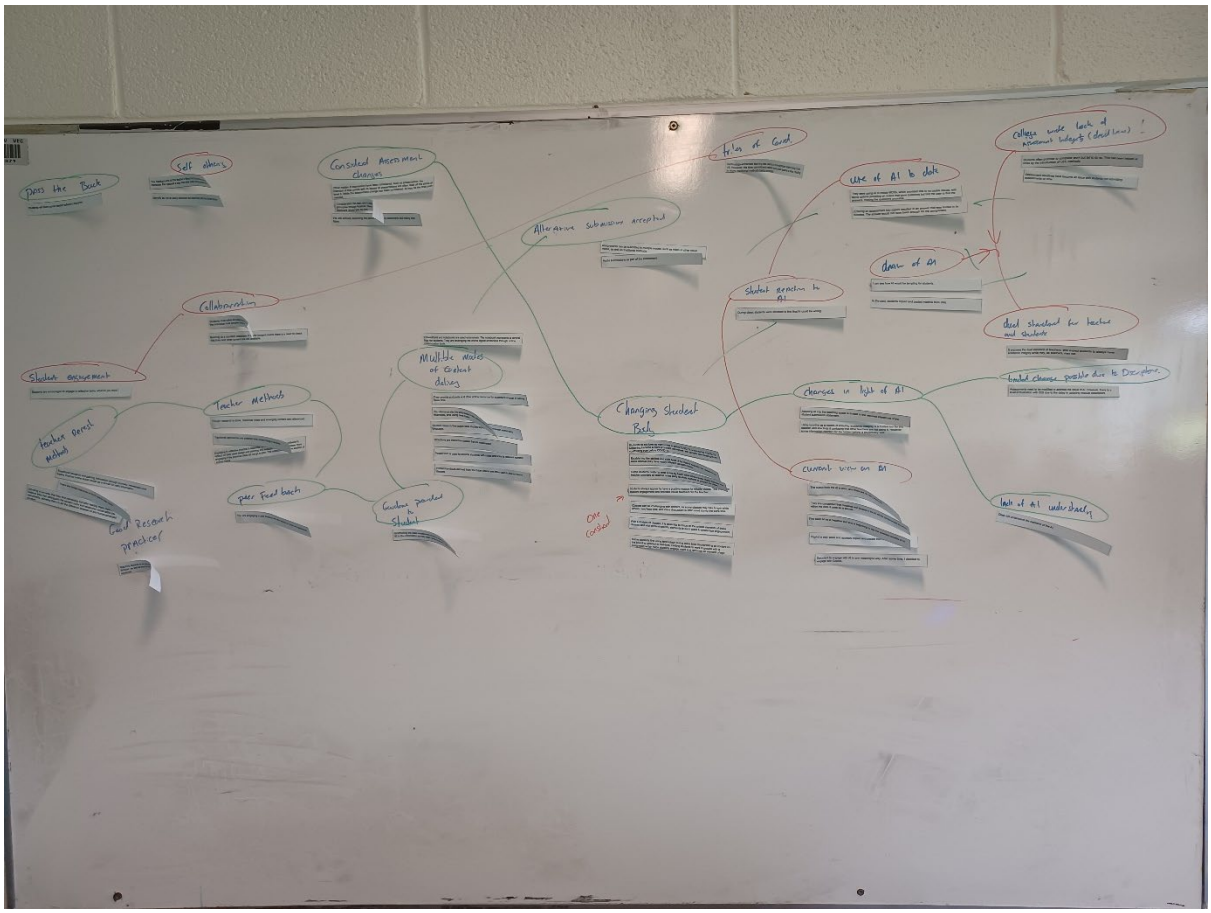
Vincent



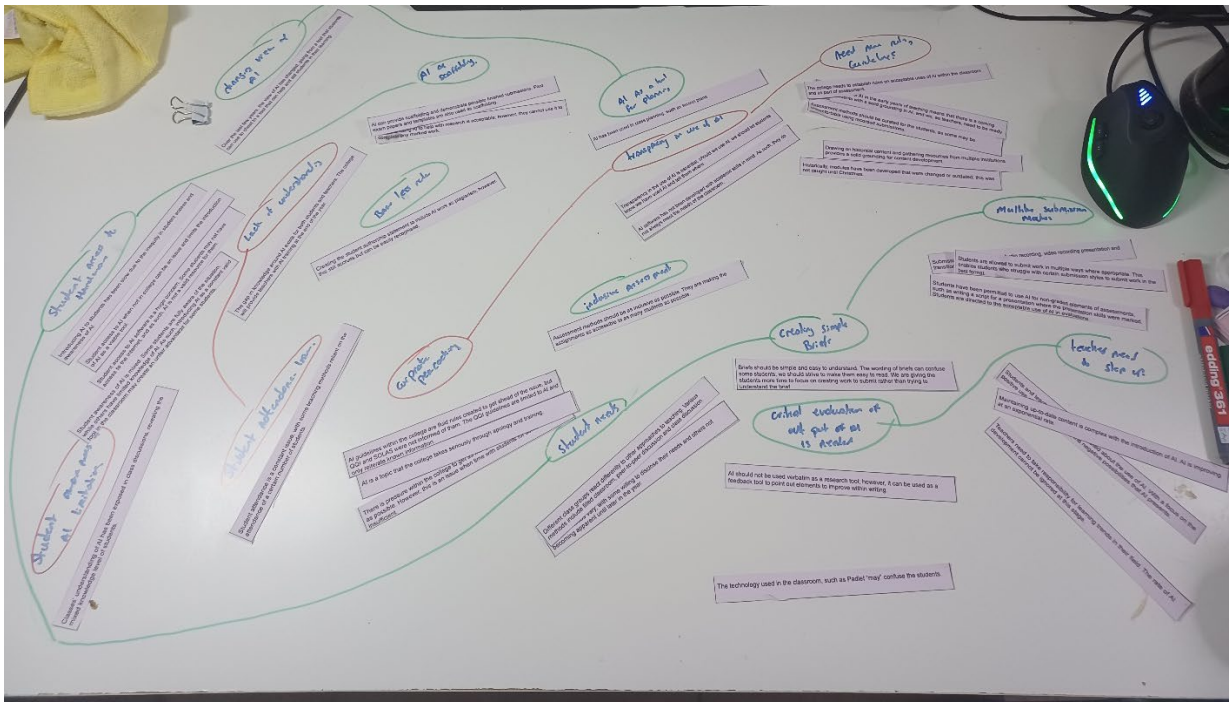
Elena



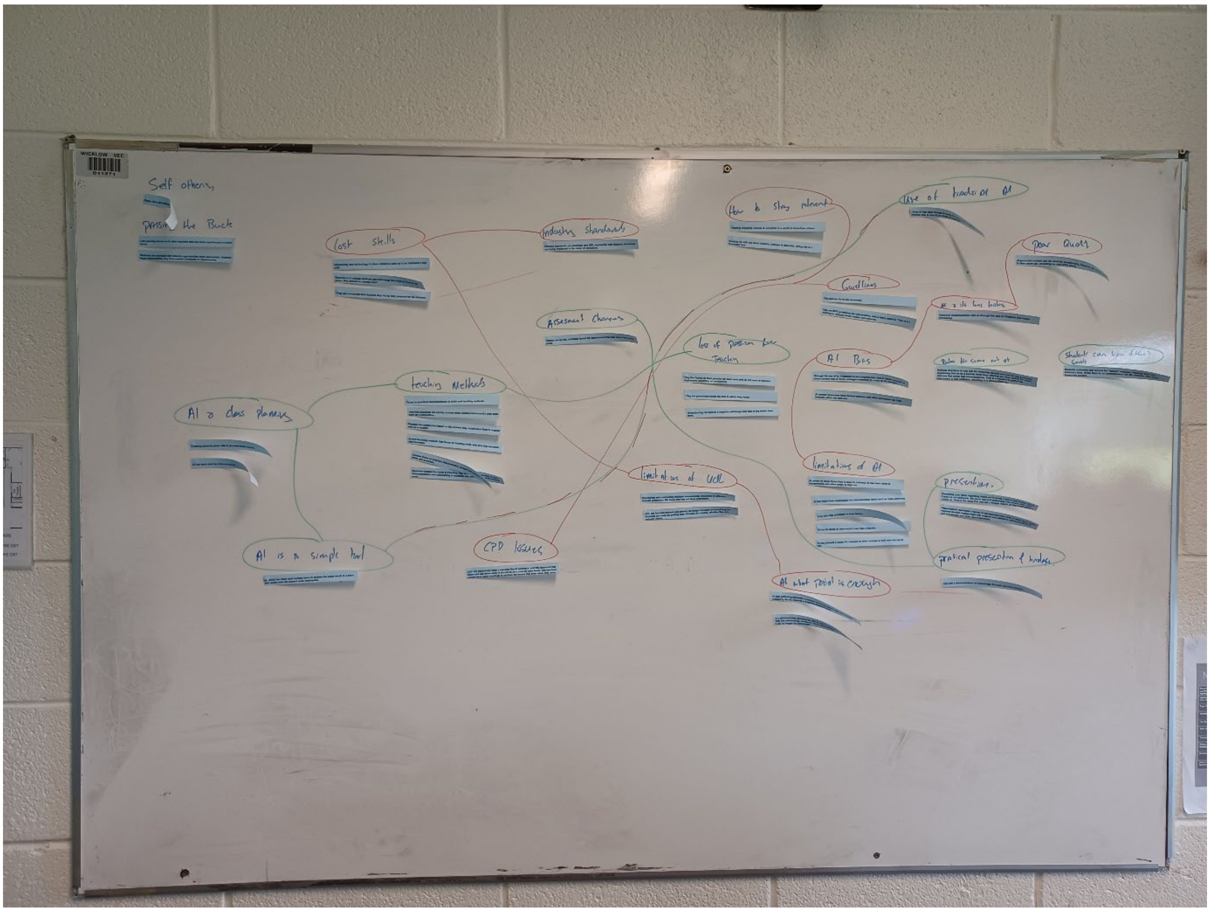
Cissnei



Reeves

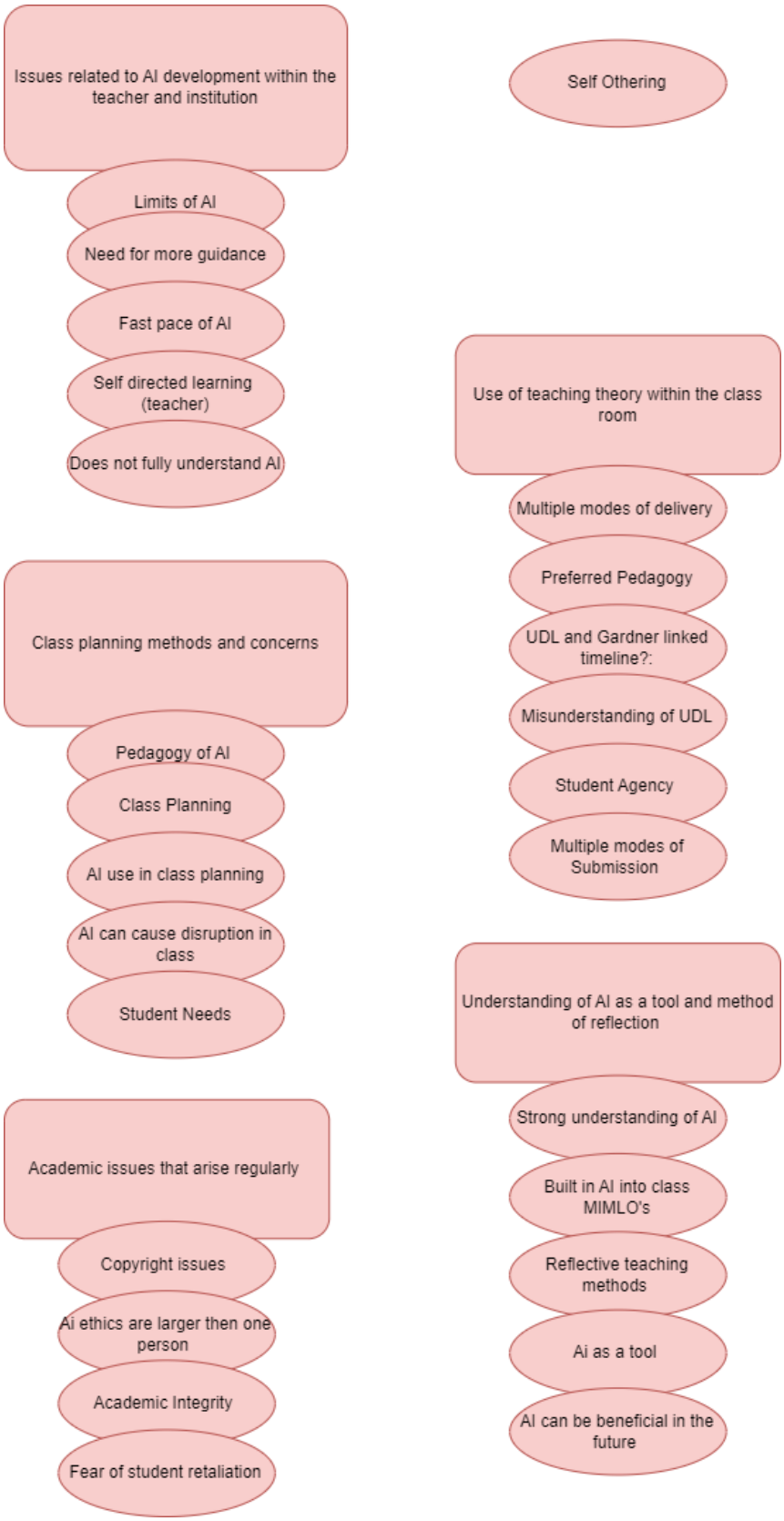


Don


WICKLOW VEC
Self others
passing the Buck
Lost Skills
Industry Standards
How to stay relevant
Use of tradition AI
Poor Quality
Guidlines
Assessment Changes
Loss of passion for Teaching
AI Bias
Students can have different Goals
AI as class planning
teaching Methods
limitations of UDL
limitations of AI
presentation.
AI is a simple tool
CPD Issues
practical presentation & knowledge
At what point is enough

Appendix 10: Individual Themes Digitised

Vincent



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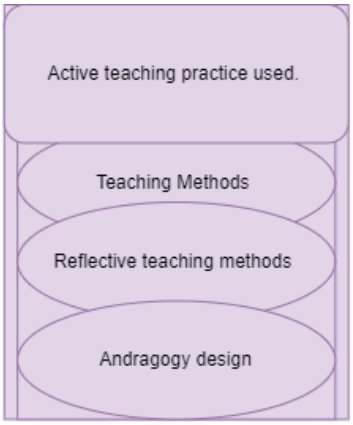
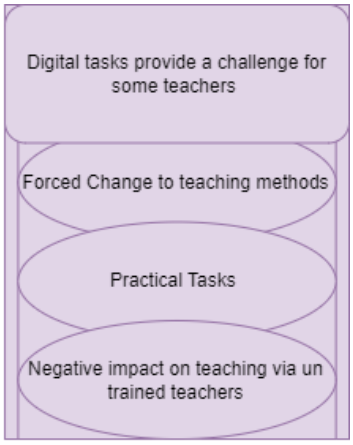
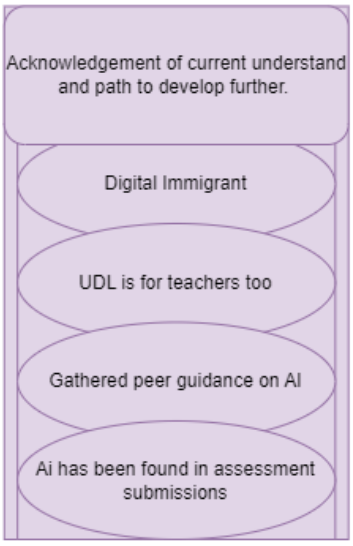
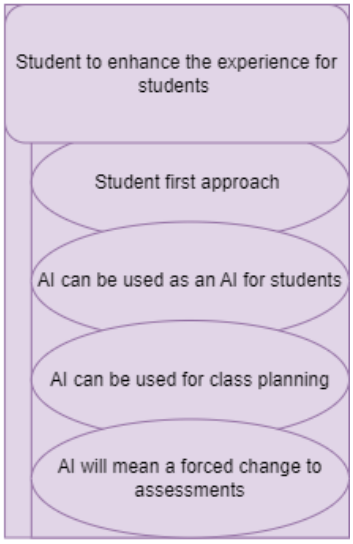
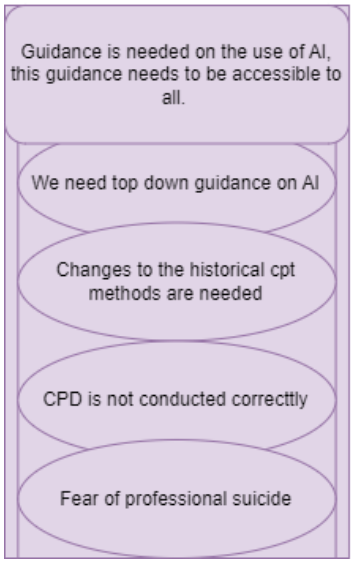
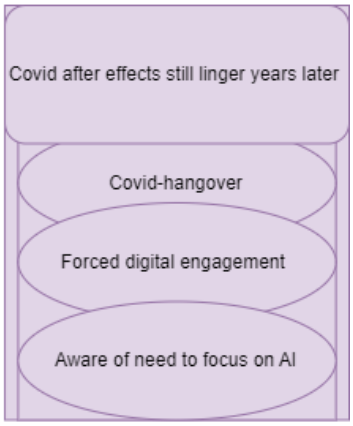

Active teaching practice used.
Teaching Methods
Reflective teaching methods
Andragogy design


Digital tasks provide a challenge for some teachers
Forced Change to teaching methods
Practical Tasks
Negative impact on teaching via un trained teachers


Acknowledgement of current understand and path to develop further.
Digital Immigrant
UDL is for teachers too
Gathered peer guidance on AI
Ai has been found in assessment submissions


Student to enhance the experience for students
Student first approach
AI can be used as an AI for students
AI can be used for class planning
AI will mean a forced change to assessments

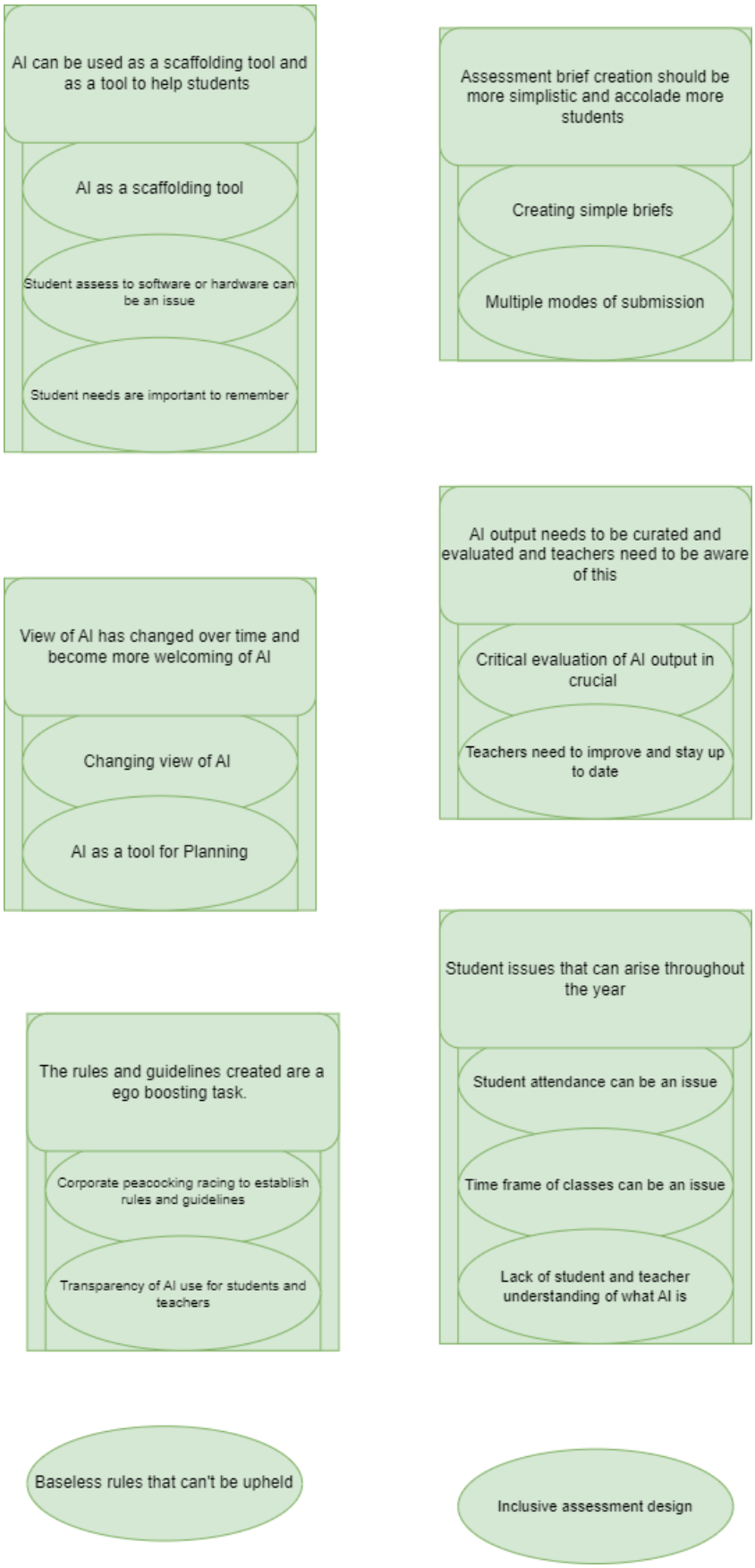

Guidance is needed on the use of AI, this guidance needs to be accessible to all.
We need top down guidance on AI
Changes to the historical cpt methods are needed
CPD is not conducted correctly
Fear of professional suicide


Covid after effects still linger years later
Covid-hangover
Forced digital engagement
Aware of need to focus on AI

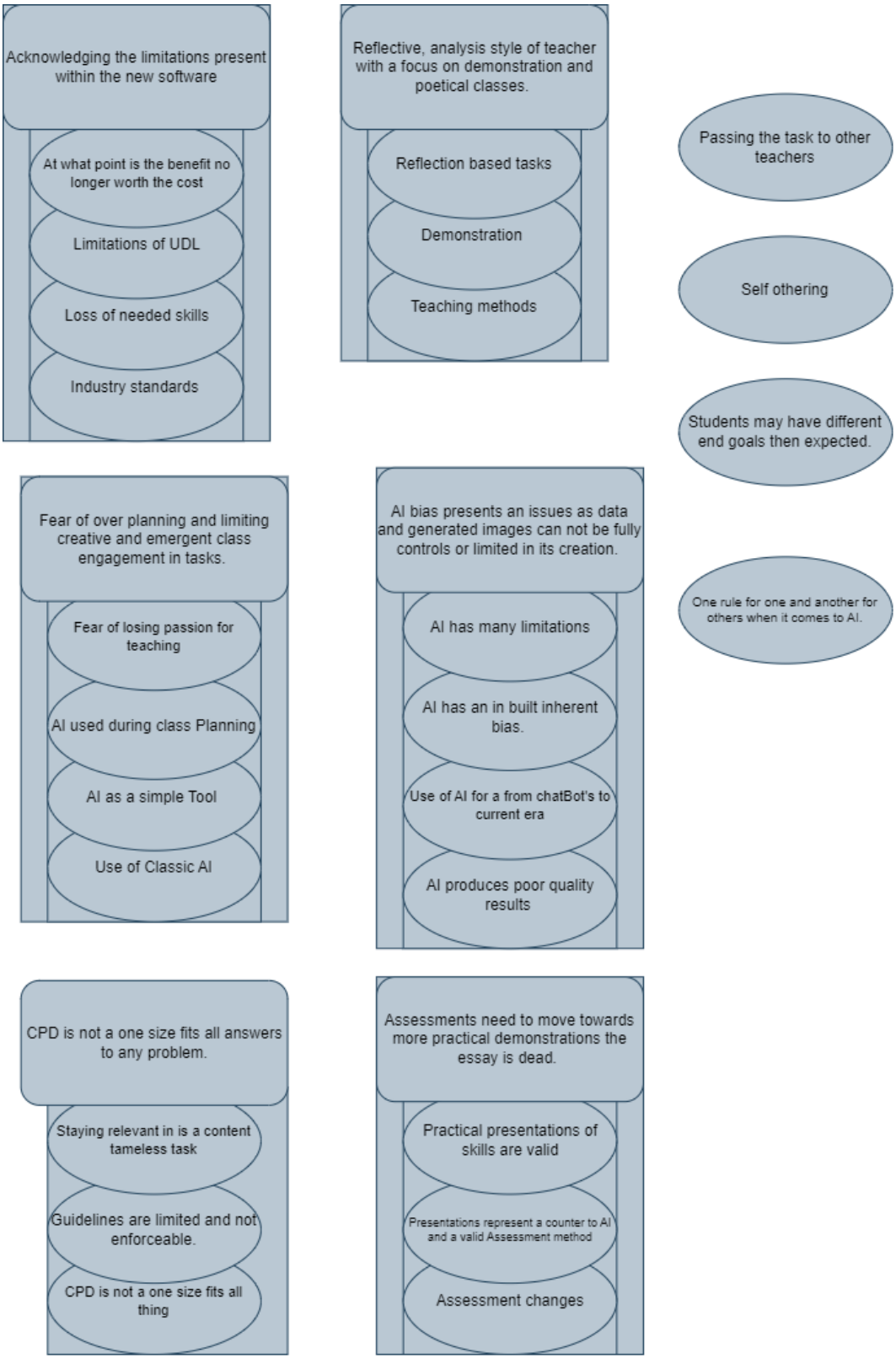
Cissnei


Challenges encounter when encouraging engagement within the class room
Trials of Covid
Collaboration
Student engagement
Time limitations
Adaptation of Assessment to better assess in a more holistic format
Alternative submissions accepted
Guidance provided to students
Peer Feedback (Teacher)
Self Othering
Lack of constant standards demonstrated between students and teachers
Lack of transparency between students and teachers.
College wide lack of assessment integrity
Draw of AI for students
Adaption to AI within a professional context
Evolving view of AI
Student reaction to AI
Use of AI to Date
Passing the tasks to other teachers
Adaption to the introduction to AI FE and perceived needed changes.
Lack of AI Understanding
Changes in light of AI
Changing Student Body
Considered Assessment Changed
Active teaching practices, data gathering and keeping up to date with current developments.
Multiple modes of Content Delivery
Teaching Methods
Teacher Content gathering

Reeves


AI can be used as a scaffolding tool and as a tool to help students
AI as a scaffolding tool
Student assess to software or hardware can be an issue
Student needs are important to remember
Assessment brief creation should be more simplistic and accolade more students
Creating simple briefs
Multiple modes of submission
AI output needs to be curated and evaluated and teachers need to be aware of this
Critical evaluation of AI output in crucial
Teachers need to improve and stay up to date
View of AI has changed over time and become more welcoming of AI
Changing view of AI
AI as a tool for Planning
Student issues that can arise throughout the year
Student attendance can be an issue
Time frame of classes can be an issue
Lack of student and teacher understanding of what AI is
The rules and guidelines created are a ego boosting task.
Corporate peacocking racing to establish rules and guidelines
Transparency of AI use for students and teachers
Baseless rules that can't be upheld
Inclusive assessment design

Don


Acknowledging the limitations present within the new software
At what point is the benefit no longer worth the cost
Limitations of UDL
Loss of needed skills
Industry standards
Reflective, analysis style of teacher with a focus on demonstration and poetical classes.
Reflection based tasks
Demonstration
Teaching methods
Passing the task to other teachers
Self othering
Students may have different end goals then expected.
Fear of over planning and limiting creative and emergent class engagement in tasks.
Fear of losing passion for teaching
AI used during class Planning
AI as a simple Tool
Use of Classic AI
AI bias presents an issues as data and generated images can not be fully controls or limited in its creation.
AI has many limitations
AI has an in built inherent bias.
Use of AI for a from chatBot's to current era
AI produces poor quality results
One rule for one and another for others when it comes to AI.
CPD is not a one size fits all answers to any problem.
Staying relevant in is a content tameless task
Guidelines are limited and not enforceable.
CPD is not a one size fits all thing
Assessments need to move towards more practical demonstrations the essay is dead.
Practical presentations of skills are valid
Presentations represent a counter to AI and a valid Assessment method
Assessment changes

Appendix 11: Interview Questions

No.	Question	Answered Y/N
1	Can you describe your first interaction with or around AI in relation to teaching	
2	Can you walk me through an average lesson in your core subject?	
	a. What is the most significant element of this experience for you?	
3	How do you implement technology in your classroom to facilitate learning (e-learning, AI Ed, Technology enhanced learning)?	
4	Can you walk me through your process when planning a class (Have/Do you utilize AI in this process?	
	a. How and why are different technologies considered?	
	b. Can you explain the limiting factors that influence your choice of class materials?	
5	Reflecting on the past two years, do you feel AI has affected your lesson planning?	
6	Could you describe your use of technology in teaching?	
	a. What are some specific examples of Technology and its use in your lesson experience?	
7	Have you noticed any changes in your teaching methods due to the introduction of AI? If so, can you expand on these changes?	
8	When reflecting on your teaching practice, how do you feel your teaching aligns with UDL principles?	
	a. Can you provide examples of this alignment?	
9	In the context of your practice, what pedagogical approach do you feel best describes your methods.	
	a. What aspects of this pedagogy appeal to you?	
10	Have you had the opportunity to review the QQI and BIFE documentation regarding AI?	
	a. How do you feel that this has affected your approach to teaching?	
11	Considering the ethical impact of teaching, have you considered the impact AI may have? How has this affected your approach to teaching?	
12	How has your view of AI evolved in the last 1-2 years?	
13	How have your interactions with AI changed in the previous 1-2 years?	