



Title: Exploring User Experience and Satisfaction
with the Hybrid-Flexible (HyFlex) Model
at SIT Invercargill Campus

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**Exploring User Experience and Satisfaction
with the Hybrid-Flexible (HyFlex) Model
at SIT Invercargill Campus**

by

Namal Darshana Balasuriya

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Student Declaration

“I, Namal Darshana Balasuriya, declare that the Master by Research Project entitled Exploring User Experience and Satisfaction with the Hybrid-Flexible (HyFlex) Model at SIT Invercargill Campus is my own work and contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work. The ideas presented are my own opinions and not necessarily those of Southern Institute of Technology”.

Signature: 

Date: July 19, 2024

Abstract

The global pandemic COVID-19 has reshaped educational delivery methods, prompting many institutions to adopt flexible approaches even beyond the crisis. Te Pūkenga, a prominent regulatory body in New Zealand's tertiary education sector, has also encouraged its partnering institutions to provide flexible learning opportunities for students. The purpose of this research is to investigate user experience and satisfaction with the Hybrid-Flexible (HyFlex) model at the Southern Institute of Technology (SIT) Invercargill campus in New Zealand. To achieve this, the study sets out to explore perceptions from both students and faculty members, uncovering the challenges they encounter and revealing insights into their overall satisfaction with the model. A mixed-methods approach was used to analyse data gathered through two survey techniques: a student questionnaire and interviews with faculty members. Descriptive statistical analysis was applied to 52 student responses, while qualitative thematic analysis was conducted on data from 8 faculty interviews. The findings indicated that users prefer the traditional on-campus mode for learning and delivering due to its ability to maintain engagement compared to the online mode. However, health conditions, travel barriers, and employment constraints are the primary reasons learners opt for online learning. Therefore, ensuring adequate training for students and faculty members, enhancing faculty members' situational awareness, and regulating class sizes are vital improvements that can mitigate the challenges of maintaining interactions and enhance the overall user experience and satisfaction with the HyFlex model at SIT Invercargill campus. The derived conclusions offer only a partial view of the overall landscape due to the constraints of limited sample sizes and time. To obtain a more comprehensive and realistic perspective, future studies should involve a larger sample. Additionally, expanding the research to include other New Zealand polytechnics and universities that implement the HyFlex model would further enrich the findings.

Keywords: Hybrid Education, User Perceptions, Learning and Teaching, Blended Delivery, Synchronous Learning, Asynchronous Learning

Dedication

I dedicate this master's thesis to my beloved family—my parents, wife, and son. Your unwavering support and boundless encouragement have been the foundation of my academic journey. From the early mornings of study sessions to the late nights of writing, your love and understanding have sustained me. This achievement is as much yours as it is mine, and I am forever grateful for your sacrifices and belief in me.

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List of Acronyms

AI	Artificial Intelligence
AV	Audio Visual
BB	Blackboard
BoK	Body of Knowledge
CoI	Community of Inquiry
EDM	Education Delivery Management
EfS	Education for Sustainability
e-Learning	Electronic Learning
ENZ	Education New Zealand
GDP	Gross Domestic Product
HyFlex	Hybrid-Flexible
IEAA	International Education Association of Australia
IP	Interview Participant
LMS	Learning Management System
MAM	Master of Applied Management
MoE	Ministry of Education
MS	Microsoft
NEGP	National Education Growth Plan
NELP	National Education and Learning Priorities
NZ	New Zealand
NZQA	New Zealand Qualifications Authority
NZQCF	New Zealand Qualifications and Credentials Framework

NZQF	New Zealand Qualifications Framework
PESTEL	Political, Economic, Social, Technological, Environmental, and Legal
QP	Questionnaire Participant
QR	Quick Response
SAMR	Substitution Augmentation Modification Redefinition
SDGs	Sustainable Development Goals
SIT	Southern Institute of Technology
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TEOs	Tertiary Education Organisations
TEC	Tertiary Education Commission
TES	Tertiary Education Strategy
UDL	Universal Design for Learning
UN	United Nations
URL	Uniform Resource Locator
UX	User Experience

Chapter 1. Introduction

1.1. Introduction

With the spread of COVID-19, the education system faced threats, prompting institutions to rapidly adjust strategies by shifting to online education from traditional delivery methods (El Refae et al., 2021, p. 299; Joshi et al., 2021, p. 206). In 2021, the Southern Institute of Technology (SIT) Invercargill campus implemented Hybrid-Flexible (HyFlex) model as a technology-enriched collaborative learning and teaching model for multiple programmes, selecting Screen Arts as the first pilot programme (SIT, 2022b).

The HyFlex approach utilises a combination of software and hardware technologies to meet delivery, assessment, and evaluation needs in both in-person and online learning models (SIT, n.d.-h; Viano, 2023). Furthermore, it made learning more flexible by allowing learners to study at their own pace through real-time or recorded sessions (Viano, 2023). This study aims to identify user experiences and challenges faced by students and faculty members, while assessing satisfaction levels to measure the effectiveness and impact of the HyFlex model.

The research conducted involving 21 student participants in the New Zealand (NZ) Diploma in Construction programme, provided a basic understanding of the challenges they faced while learning through the HyFlex model (Cheng, 2023, p. 124). The results revealed that difficulties in performing group activities, maintaining smooth communication transitions, and facing technical challenges when accessing resources were some downsides of the HyFlex model (Cheng, 2023, p. 127). Finding feasible solutions to overcome these barriers is necessary. It demonstrates that some hurdles remain open and require further research on the HyFlex model to address and mitigate the challenges faced by its main stakeholders. Upon analysing those challenges, it became evident that the majority of them arise from the online mode of the HyFlex model. Therefore, focusing more attention on the online delivery mode of HyFlex is essential.

Since the SIT Invercargill campus also uses the HyFlex model to deliver its programmes, students and faculty members at SIT are likely to face similar challenges as those in other

institutions. Therefore, to meet the expectations of both learners and faculty, it is essential to understand their experiences with the HyFlex model.

1.2. Statement of the Problem

The two concepts "Hybrid" and "Flexible" are combined to formulate the model of the HyFlex. It had been experimented with long before the COVID-19 pandemic by various educational institutes for managing the delivery of their courses/programmes (Viano, 2023). Therefore, the HyFlex model provides the opportunity to maintain traditional face-to-face sessions while extending delivery through the integration of technology (Viano, 2023). This allows learners the flexibility to participate either synchronously (online in real-time alongside face-to-face students) or asynchronously (through recorded sessions), according to their preferences (Viano, 2023). After the COVID-19 pandemic, HyFlex model emerged as a critical element in the education sector (Rider & Moore, 2021). This led to a growing need for higher education institutions to adapt their delivery methods, transitioning to online or hybrid formats, and using information technology to offer their courses (Rider & Moore, 2021). As previously mentioned, the SIT Invercargill campus introduced the HyFlex model for various programmes by 2021. Success stories from students like Becky Littlewood (Bachelor of Therapeutic and Sports Massage), Charlene Stewart (Diploma in Animation), and Joe Horvath (NZ Diploma in Workplace Health and Safety Management) confirmed that they have experienced the benefits of the flexible education options provided by the HyFlex model by SIT (Academy Group, 2023, p. 38). It is important to investigate challenges faced by students and faculty members in order to find solutions or mitigate them. The following are some challenges discovered during previous studies, mostly related to the online learning mode in the HyFlex model.

One of the main challenges revealed in the literature is the technical difficulties faced by both learners and educators (Ferri et al., 2020, p. 6; Joshi et al., 2021, p. 10). These technical challenges may arise from connectivity issues during sessions, as well as interruptions due to the unavailability of suitable devices or poor connectivity for participating in sessions and accessing resources/materials (Ferri et al., 2020, p. 6; Joshi et al., 2021, p. 10). Furthermore, the research indicates that technical challenges can lead to a negative user experience for stakeholders and may impact user satisfaction (Ferri et al., 2020, p. 6; Joshi et al., 2021, p. 10).

Compared to face-to-face classroom setups, virtual classroom settings may result in concentration and engagement difficulties among participants (Chakraborty et al., 2021, p. 4; Ferri et al., 2020, p. 8; Joshi et al., 2021, pp. 14, 15). This can disrupt the achievement of the expected learning quality and objectives by students in both the asynchronous and synchronous modes of delivery in the HyFlex model (Chakraborty et al., 2021, p. 4; Ferri et al., 2020, p. 8; Joshi et al., 2021, pp. 14, 15). Moreover, many modern learners possess technological literacy for online learning. However, achieving the expected level of communication, interaction, and knowledge acquisition in an online setup is often lower compared to the traditional physical classroom-based learning model (Mushtaha et al., 2022, p. 12). Another major issue might be distractions that can occur during the learning process (Joshi et al., 2021, p. 7). Similar to the challenges previously stated, this issue mostly affects online learning and teaching modes. According to the literature, these distractions may be introduced by family members or external parties (such as neighbours or visitors) (Joshi et al., 2021, p. 7). Consequently, these distractions may interfere with the concentration of participants (i.e., students and faculty members) and can lead to a disruption in the flow of the session on HyFlex model (Joshi et al., 2021, p. 7).

The challenges mentioned above are important to consider for further research aimed at overcoming them in future versions of the revised HyFlex model. Basic literature analysis revealed a lack of research covering all delivery modes in the HyFlex setup, confirming the need for research to explore user experience and satisfaction with the HyFlex model among students and faculty members at the SIT Invercargill campus.

1.3. Research Methodology

The research was conducted based on interpretivist philosophy, employing a descriptive approach. Data gathering was organised around a survey design. Hence, data were collected from current students and faculty members who had experience with HyFlex at the SIT Invercargill campus. This was done by utilising an online questionnaire for students and semi-structured interviews for faculty members. Mixed-methods data were collected using both open and closed-ended questionnaire, alongside qualitative data gathered through interviews for this research. Consequently, an inductive approach was adopted with the aim of uncovering patterns and insights that naturally emerged from the collected data.

1.4. Significance of the Study

As an ethical practice, businesses in NZ prioritise the United Nations (UN) Sustainable Development Goals (SDGs) (NZTE, 2023). Therefore, businesses in the education sector have a responsibility to contribute to Goal 4: Quality Education and Goal 8: Decent Work and Economic Growth. They ensure providing lifelong learning opportunities and address the barrier preventing one out of four people from accessing education, employment, or training needs through a sustainable, quality educational platform (UN, n.d.-a, n.d.-b). This research addresses the dilemma in Education Delivery Management (EDM), ensuring alignment with certain UN SDGs related to educational management practices. Therefore, it is relevant to the field of Applied Management.

The NZ Ministry of Education (MoE) has also emphasised the importance of building a high-quality education system through strategies and policies aimed at preparing a future-ready workforce for the 21st century (NZ MoE, 2022d). To achieve this, regulating the attendance and engagement of learners was identified as a key measurement (NZ MoE, 2022a). Furthermore, the action plan for Pacific education 2020-2030 outlines government initiatives for all education service providers, including tertiary providers, to support learners in fulfilling their aspirations (NZ MoE, 2023a, p. 7). Therefore, SIT's HyFlex model aligns with the expectations set by the NZ education system, making effective management through principles and strategies vital. So, the factors revealed demonstrate that the research is related to the field of Applied Management. Furthermore, the NZ curriculum emphasises that students thrive academically when they have positive relationships with their peers and educators, and when they feel valued and accepted within their learning community (NZ MoE, 2023d). The HyFlex model facilitates such interactions. Therefore, this research will aim to enhance its effectiveness and quality.

The findings of this research are intended to benefit direct stakeholders, such as students and faculty members of HyFlex model, both within and outside of SIT. These findings will inform strategies aimed at enhancing the productivity and effectiveness of the HyFlex model in the future. Therefore, the research findings will benefit not only the SIT Invercargill campus but also the entire education industry in delivering courses/programmes using the HyFlex model. It promotes the readiness of educational institutions for upcoming emergencies, ensuring continuity

of operations and objectives without compromising the quality of the education system. Additionally, it prioritises the safety and well-being of all stakeholders. The HyFlex model enables institutions to respond effectively to unexpected disruptions or changes in circumstances, such as natural disasters, public health emergencies, or technological challenges.

1.5. Research Question/Aim and Objectives

Research Question:

How does the HyFlex model impact the user experience and satisfaction among students and faculty members at the SIT Invercargill campus?

Research Aim:

The aim of this research is to explore the user experience and satisfaction with the HyFlex model at the SIT Invercargill campus.

Research Objectives:

1. To identify the factors affecting the user experience of the HyFlex model in the SIT Invercargill campus.
2. To explore the challenges faced by students of the HyFlex model in the SIT Invercargill campus.
3. To explore the challenges faced by faculty members of the HyFlex model in the SIT Invercargill campus.
4. To determine the user satisfaction level of the HyFlex model in the SIT Invercargill campus.

1.6. Structure of Thesis

The following section explains the structure of this thesis, assisting readers in understanding its content organisation. The readers can gain a clear view of the connection between the chapters.

Chapter Two: Theory and Industry Analysis

This section explores the fundamental theory behind the HyFlex model's applicability in education. It connects research findings to the education industry, specifically within the domain of applied management. It demonstrates how the hybrid model enhances educational practices.

Chapter Three: Literature Review

This section reviews relevant literature on the HyFlex model, synthesising previous studies to build knowledge and identify the research gaps. It offers insights into prior research and their findings, with a critical analysis, aiming at the formulation of new research.

Chapter Four: Methodology

This chapter comprehensively addresses the methodological approach employed in the research, highlighting the interconnections between the research approach, design, data collection and analysis methods. It justifies the selection of those methodological choices and covers the participant selection process and the rationale behind sample sizes.

Chapter Five: Findings and Analysis

This chapter focuses on conducting the analysis based on the gathered data through the questionnaire and interviews. It explains the techniques employed and the relevance of the information obtained to meet the research objectives. Moreover, it interprets and presents the insights of the findings by detailing how they contribute to the education industry.

Chapter Six: Recommendations and Conclusion

This chapter presents the key findings of your research in a more summarised form and addresses the limitations of the conducted research. It explores opportunities for future research and enhancements. Therefore, it critically evaluates the research process, discussing any challenges encountered, lessons learnt, and offering suggestions.

Chapter 2. Theory and Industry Analysis

2.1. Introduction

This chapter aims to identify the relationship between the research and the field of EDM. Moreover, it presents a holistic understanding of theory and practices in the field of EDM. First of all, it is vital to understand the education industry and the basic needs of its stakeholders by critically engaging with established theories and frameworks within the area of education, management, and related disciplines. The set framework and guidelines by the NZ MoE and related governing bodies are addressed in the following sections. Since, this research focuses on examining user satisfaction and experience with the HyFlex model at the SIT Invercargill campus, conducting a detailed analysis of both the internal and external environment is essential. This analysis will help pinpoint the benefits that the research outcomes can contribute to the industry and how the research findings can be meaningfully interpreted and applied. Furthermore, the chapter will support to illustrate the challenges and opportunities that shape the educational landscape.

2.2. Theoretical Analysis

2.2.1. Community of Inquiry (CoI) Framework

The CoI framework, developed in 2000, functions as a role-play model that emphasises the importance of cognitive presence, social presence, and teaching presence, which significantly impacts the educational experience of the learners (Fiock, 2020, p. 136; Garrison, 2024). It provides instructional strategies for online and blended learning environments, enhancing the quality of interactions in such programmes/courses (Fiock, 2020, p. 135; Garrison, 2024). This framework is useful for maintaining a collaborative learning process (Junus et al., 2022, p. 2284). Additionally, extending the CoI framework, other literature has identified key principles and good practices for online collaborative learning environments. These include maintaining teacher-learner and learner-learner interactions, promoting active learning through meaningful engagement, providing thorough guidance and feedback, assisting students in managing their time effectively, offering adequate information about expectations, and addressing the diverse

needs of students by providing a range of instructional strategies (Fiock, 2020, pp. 139, 140). The acceptance and recognition of the CoI framework during COVID-19 provided confirmation to practitioners of its suitability for application in educational delivery platforms, as well as for both practical and theoretical researchers exploring the benefits and further improvement of this framework (Garrison, 2024). As discussed, the HyFlex model operates as a combination of both synchronous and asynchronous learning. Therefore, this framework relates to the aspects of those learning modes.

2.2.2. Substitution Augmentation Modification Redefinition (SAMR) Model

The SAMR model, developed by Dr. Ruben Puentedura in 2009, relates to technology integration in education and supports both in-person and online learning by positively impacting teaching and learning experiences (Gillespie, 2022; NZ MoE, n.d.-b). The HyFlex model is associated with the mixed use of technology, including hardware devices for setting up the classroom and digital technologies, such as appropriate software tools for its curriculum, which provide personalised learning pathways with the use of multimedia content (PowerSchool, 2021; Viano, 2023). The correct mixture of technologies is important to enhance engagement and collaboration among participants in the learning and delivery setup (NZ MoE, n.d.-b). Furthermore, the SAMR model helps educators choose the most effective digital technologies to support their students' learning, widening the opportunities to achieve the best learning experiences (NZ MoE, n.d.-b). Additionally, the model ensures gaining a deeper understanding of educational pedagogies and provides a dynamic space to redesign teaching and learning practices, thereby facilitating effective learning through technology (Gillespie, 2022). Substitution allows the replacement of traditional teaching approaches with digital platforms without affecting their functionalities (PowerSchool, 2021). Augmentation enhances the students' experience, interactivity, and productivity (PowerSchool, 2021). Modification redesigns the context with multimedia resources, Learning Management System (LMS), and collaboration through discussion forums and feedback processes (PowerSchool, 2021). Redefinition provides new ways of conducting traditional tasks with the support of technology to improve the overall learning experience in a modified format using technology (PowerSchool, 2021).

2.2.3. Universal Design for Learning (UDL) Framework

The UDL framework, first proposed by two researchers, Dr. David Rose and Dr. Ann Meyer, in 1984, acts as a foundational model to provide proactive, inclusive learning pathways and experiences to diverse learners, regardless of their abilities (NZ MoE, n.d.-a; texthelp, n.d.). The framework helps in designing learning experiences for all learners with a range of tools and support, that minimise educational barriers and increase engagement among them (NCEA Education, n.d.; The University of Waikato, n.d.). Furthermore, the acceptance of the UDL framework is visible in the NZ education system, with various educational institutions and regulatory bodies such as Waikato University and NZ MoE (NCEA Education, n.d.; NZ MoE, n.d.-a; The University of Waikato, n.d.). The UDL framework, developed with people and context at its centre, aims to provide equally flexible learning opportunities for learners to meet their educational goals and expectations by tailoring content and processes to individual needs (NCEA Education, n.d.; texthelp, n.d.). When implementing a platform for learners, understanding their prior knowledge and experience, knowing their specific needs and preferences, considering their well-being, understanding their preferred learning mode, their cultures, identities, and motivational factors are important (NCEA Education, n.d.). Additionally, various ways of presenting information, various methods of expression and action, and diverse ways of engagement, will ensure better chances for learners to achieve their educational desires (The University of Waikato, n.d.).

2.2.4. Nielsen's 10 Usability Heuristics

Nielsen's 10 Usability Heuristics principles are a foundation for ensuring a better User Experience (UX) for users, involving considerations of factors such as usability, accessibility, usefulness, and enjoyment of the learning experience (Nielsen Norman Group, n.d.). UX is a concept that is useful when designing a system to provide a meaningful and relevant experience for its users. The model outlines important key aspects, such as keeping users informed with timely communications and feedback, maintaining a real-world natural conversation based on users' familiar language (i.e., words, phrases, and concepts), providing flexible user control and freedom within the system, adhering to consistent standards, preventing errors, minimising the cognitive effort required by users, ensuring flexibility and efficiency in processes, excluding

irrelevant information from the design, facilitating problem identification and solutions, and providing additional help and documentation when needed (Nielsen, 1994).

Overall, by considering the above-mentioned frameworks/models and associated factors influencing and facilitating conditions of the HyFlex model and education delivery, it provides a comprehensive understanding of users' behavioural intentions and actual usage behaviour in HyFlex learning environments.

2.3. Industry Analysis

The following segment outlines the details of a PESTEL Analysis conducted on the education industry in the NZ context, along with the SWOT Analysis performed with SIT as the principal organisation and the education industry as the central focus.

2.3.1. Education Industry in New Zealand

In the New Zealand education system, schools, Institutes of Technology and Polytechnics (ITPs), state-funded universities, and Private Training Establishments (PTEs) are education providers who adhere to the standards of the New Zealand Qualifications Framework (NZQF) (NZ Education, n.d.). There are 8 universities, 16 ITPs, and around 550 PTEs operating in the higher education industry in New Zealand (NZ Education, n.d.). Among them, the SIT Invercargill campus is one entity that operates under Te Pūkenga - New Zealand Institute of Skills and Technology (NZIST) (SIT, n.d.-a).

In the New Zealand context, the tertiary education system provides adaptable learning approaches (NZQA, 2024a). Additionally, the Education Code of Practice 2021 states that educational providers must ensure a safe environment for learners (both domestic and international) to achieve their learning outcomes while maintaining their well-being (NZQA, 2024a). Furthermore, the initiation of Te Pūkenga, with its affiliated educational service providers, aims to provide career-focused, flexible learning opportunities for learners to study under their preferred learning mode (on-the-job, on campus, and online) (Te Pūkenga, n.d.-a). Therefore, sufficient research and evaluations need to be conducted to ensure that the quality of education remains within the defined guidelines set by the authoring bodies.

By setting objectives aligned with the National Education and Learning Priorities (NELP) and the Tertiary Education Strategy (TES) outlined in the Education and Training Act 2020, the NZ government focuses on generating a future-ready workforce equipped with the skills demanded to meet economic, social, and environmental goals (NZ MoE, 2020, p. 1). As per the model, the key objectives are listed below.

1. Keeping learners at the centre of the education system.
2. Providing barrier-free opportunities and access to each learner.
3. Maintaining quality teaching and leadership to make a difference.
4. Providing relevant and future-ready learning pathways.
5. Providing trusted and sustainable world-class, inclusive public education.

Source: (NZ MoE, 2020, pp. 2, 3)

Furthermore, it is mandatory that the set objectives must comply with the quality assurance process and the expectations of the New Zealand Qualifications Authority (NZQA) (NZ MoE, 2020, p. 1).

2.3.2. *PESTEL Analysis*

PESTEL Analysis is one of the strategic management tools that can be used to analyse the external macro-environmental factors affecting the operations of the selected organisation or the industry (Howard et al., 2012, p. 612). Therefore, the model is used as a framework for evaluating the political, economic, social, technological, environmental, and legal factors related to educational service providers in the NZ context. In addition to the influencing factors (threats), it is essential to analyse competitive trends (opportunities) within the education industry, as they can impact the performance of business operations within an organisation (Howard et al., 2012, p. 612). PESTEL Analysis can inform strategic planning, policy development, and decision-making processes to ensure the continued success and sustainability of the education sector (Howard et al., 2012, pp. 613, 614).

Political Factors

As part of the TES outlined in the Education and Training Act 2020, the MoE in NZ allocates around \$2.8 billion of annual funds to Tertiary Education Organisations (TEOs) to support them in providing lifelong learning opportunities for learners (NZ TEC, 2023). Furthermore, based on the new immigration rules for work rights set by Immigration NZ effective from 09 October 2023, students enrolled in full-time programmes at Level 4 and above, based on the New Zealand Qualifications and Credentials Framework (NZQCF), are now eligible to work while they study (NZ Immigration, 2023). Additionally, the 2023 budget has decided to invest \$455 million over a span of five years as part of the National Education Growth Plan (NEGP), which will benefit infrastructure and innovation in the total education system (NZ MoE, 2023c). These are some of the positive factors affecting the education sector in NZ.

Economic Factors

Stats NZ confirms that in NZ, there is an annual growth of Gross Domestic Product (GDP) by 0.6% by the end of 2023 (Stats NZ, 2024a). Furthermore, they have discovered an unemployment rate of 4.0% in NZ in the final quarter of 2023, which represents a slight increase of 0.6% compared to the final quarter of 2022. This increase could negatively impact the NZ economy (Stats NZ, 2024b). However, it highlights the contribution that can be made by the education industry to minimise the unemployment rate. The research conducted by Education NZ predicts that by 2030, the contribution of international students will continuously grow, bringing financial, social, and cultural benefits for NZ (NZ Education, 2023). Furthermore, it was evident that students who complete a bachelor's degree level or higher will contribute to the regional GDP by 6.3% (Universities NZ, n.d.). It also confirms that the financial gain of a person is proportional to their education level, meaning that the higher the level of education, the greater the chances of achieving a better income level (Scott, 2020, p. 10).

Social Factors

When considering domestic student enrolments in 2023 based on demographic factors such as ethnicity, there is growth in numbers compared to 2022 for Māori, with an increase of 3.7%, for Asian students, with an increase of 4.7%, and for other ethnicities, with an increase of

3.5%, respectively (Education Counts, n.d.). This implies that the demand for education is increasing. Furthermore, the rise in international student enrolments from 33,470 in 2022 to 42,695 in 2023, a 27.6% increase, confirms that the education industry is now recovering after being impacted by the COVID-19 pandemic, which led to the closure of borders for international students (Education Counts, n.d.). Additionally, joint research conducted by Education New Zealand (ENZ) and the International Education Association of Australia (IEAA) claimed that the COVID-19 pandemic has made a significant impact on learners' experiences, mostly due to the isolation caused by online learning, resulting in challenges in maintaining motivation while conducting their studies (University of Auckland, 2020).

Technological Factors

While setting a 10-year strategy called “Connected Ako: Digital and Data for Learning”, in collaboration with the NZ MoE, NZQA, and the Tertiary Education Commission (TEC), aims to explore the technological challenges and opportunities for educational sector agencies to provide their students and staff members with the tools to succeed in the digital world and to foster the growth of New Zealanders (NZ MoE, 2023b, p. 5). The strategy focuses on the following key aspects: providing safe and effective digital services to all education agencies, while transforming learning and teaching through improved digital services (NZ MoE, 2023b, p. 10). Furthermore, the NZ government has set a vision for 2032 while establishing the “Digital Strategy for Aotearoa”, with three key themes “Trust”, “Inclusion”, and “Growth” at the centre to ensure sufficient communication and connectivity resources to access basic necessities for life, employment, and education (Digital NZ, 2022; MBIE NZ, n.d.).

Environmental Factors

When working towards creating a future that can withstand climate challenges, education sector has an important role to play (NZ MoE, 2022e). The initiation of Te Pūkenga has made learning opportunities more flexible, offering affordable learning models such as online learning, on-campus learning, or even learning while working (Te Pūkenga, n.d.-b). This can be considered a factor in minimising the environmental impact caused by education sector. Furthermore, Education for Sustainability (EfS) is another programme that starts implementing from the school level, aiming to ensure a sustainable education system while safeguarding the

well-being of people and the planet (NZ MoE, 2022b). The action plan set by the “Environmental Education for Sustainability Strategy” is another approach developed by the NZ government to provide necessary understanding and skills, creating awareness for students about environmental complications and finding solutions to such matters (NZ Department of Conservation, 2017, pp. 1, 3).

Legal Factors

The Education and Training Act 2020 and the Education and Training Amendment Act 2021 serve as frameworks for both international and tertiary education disciplines, ensuring compliance with legal responsibilities under education rules and legislation (NZ MoE, 2024). Furthermore, the set guidelines under those acts prevent additional charges when progressing to another year within Te Pūkenga, greatly supporting learners in achieving their educational goals (NZ MoE, 2024). The stress caused by work commitments for staff members in an education agency can be managed to a certain extent by the minimum rights set for employees, such as the annual leave policy, paid sick leave, parental leave, minimum wage policy, and overtime payment (if applicable), as regulated by Employment NZ and outlined in the employment contract provided by the employer (Employment NZ, 2023). Additionally, the Education (Pastoral Care of Tertiary and International Learners) Code of Practice 2021 ensures that all learners will have a safer and well-supported learning environment to pursue their educational dreams (NZQA, 2024b).

2.3.3. SWOT Analysis

SWOT Analysis is used as a fundamental concept for analysing the internal factors, such as the strengths and weaknesses of your own organisation, which can be controlled, and the external factors, such as the opportunities and threats created by the external environment, which you cannot easily control (Sarsby, 2016, p. 8). Consider Table 1, which outlines the factors applicable to the SIT Invercargill campus within the tertiary education industry.

Table 1

SWOT Analysis for SIT and Education Industry

Strengths	Weaknesses
<ul style="list-style-type: none"> • SIT’s Zero Fees Scheme - Affordable learning options are available for multiple programmes and will continue into 2024, offering accessible pathways for domestic students to achieve industry-specific qualifications (SIT, 2023). • Reputation for high-quality education - In the Leading Change category, the SIT HyFlex project was nominated for the Anthology Catalyst Award (SIT, 2022b). • Diverse range of programmes /courses and flexibility of learning - A significant number of courses and three different study methods (i.e., physical classroom-based learning, online sessions, pre-recorded sessions - encourage part-time learners) are now available under the HyFlex model (SIT, n.d.-h). • Modern facilities and resources - SIT provides services for its learners, including but not limited to state-of-the-art classrooms, student support service, 	<ul style="list-style-type: none"> • Course cancellations - There is a possibility of cancelling any programme due to insufficient student enrolment (SIT, n.d.-e). • Increased course prices - The course prices have increased due to the uniformity of Te Pūkenga merging, and some free programmes have changed to being charged for (Tomsett, 2022). • Limited programmes/courses - In comparison to large-scale universities, SIT offers fewer programmes/courses (SIT, n.d.-f; University of Auckland, n.d.; University of Canterbury, n.d.).

<p>health and well-being service, computer laboratories and equipment, childcare centre, and gym facility (SIT, n.d.-d).</p>	
<p>Opportunities</p> <ul style="list-style-type: none"> • Government support - Government offers fees-free study options for students who are studying for the first time (NZ TEC, n.d.; SIT, n.d.-b). Additionally, a new vocational education system set by NZQA aims to provide a collaborative, flexible, innovative, and sustainable learning system for all learners, which will benefit SIT’s operational model (NZQA, 2023). • Industry partnerships and community engagement - Students at SIT will receive on-the-job training and various other opportunities during their study period. The affiliation with industry organisations and other partners also enhances their chances of community engagement (SIT, 2021, 2022a). • Internationalisation opportunities - SIT students have the option to study abroad with the support of partner universities and institutions around the world (SIT, n.d.-g). Additionally, SIT welcomes 	<p>Threats</p> <ul style="list-style-type: none"> • The impact of COVID-19 on tertiary education - Research conducted by the NZ MoE found that there was a 33% decrease in international student enrolments in 2021 due to the global pandemic, which affected the entire education system and industry (Smart, 2021, p. 2). Furthermore, another study by the NZ MoE claimed that due to the pandemic, course completion rates in all tertiary education institutions were affected during the period from 2019 to 2022, with a reported rate of 79% in Te Pūkenga establishments (Marshall, 2023, p. 9). • Impact of government regulatory changes - The recent changes implemented by the government to switch first-year cover-up fees for last year can impact the number of enrolments for programmes, as well as potentially widen the financial stress experienced by educational institutions (Kenny, 2024).

<p>international students through a range of study programmes, bringing additional revenue to both the organisation and the country (SIT, n.d.-c).</p>	<ul style="list-style-type: none"> • Economic downturn - The global financial crisis, higher operational costs, and the decline in the number of domestic student enrolments have resulted in a loss of \$99 million in state universities, highlighting the impact caused by the economic conditions in NZ (Gerritsen, 2023). This affects the entire education industry and the economy of the whole country.
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2.4. Summary

This chapter examines the surrounding environment related to this research by analysing the education industry in terms of political, economic, social, technological, environmental, and legal factors. It aimed to understand the competitive dynamics within the industry and to gain an initial understanding of global opportunities and threats that can impact organisational processes. Furthermore, the industry analysis helps identify market trends, consumer preferences, regulatory changes, and economic factors that can influence SIT’s business operations. Additionally, it reveals the internal strengths and weaknesses of SIT, pinpointing opportunities for improvement. Moreover, the conducted SWOT analysis validates the performance of SIT and its products and services against industry norms and competitors. Furthermore, frameworks and models related to education delivery modes such as CoI, SAMR, UDL, and Nielsen’s 10 Usability Heuristics will be used as a basis for understanding stakeholder expectations and perceptions regarding satisfaction and user experience requirements. Understanding the industry context has enabled better identification of gaps in knowledge or areas requiring further investigation, thereby prioritising research efforts accordingly. That ensures the formulation of more informed and effective decisions to shape upcoming tasks associated with the research journey. This chapter has provided valuable insights and will contribute to knowledge advancement. Additionally, analysing existing research and industry literature serves as a starting point for in-depth analysis.

Chapter 3. Literature Review

3.1. Introduction

During the COVID-19 pandemic era, most countries, including New Zealand, implemented social distancing and travel restriction protocols to control the spread of the coronavirus (IMF, 2021). Therefore, operations within the entire education system were disrupted and achieving Goal 4 of the UN SDGs, providing quality education for learners was challenging during that period (Freshwater, 2020; Meinck et al., 2022, pp. 54, 55). Educational service providers had to rapidly modify their strategies and adapt to new technologies to provide alternative learning approaches to traditional face-to-face delivery (Freshwater, 2020). Additionally, there is now an urgent need for educational institutions to adopt flexible learning opportunities that provide equal access and cater to diverse learner needs (NZ MoE, 2022c). This includes creating a future-ready connected environment that remains accessible during emergencies and offers mechanisms for studying outside the traditional classroom-based setup (NZ MoE, 2022c). Hence, the HyFlex model plays a vital role in meeting this industry requirement. In practice, there are various perceptions of different modes of learning, such as on-campus learning and online learning, held by users such as educators and learners (Freshwater, 2020).

This literature review explores and summarises the factors influencing user experience and satisfaction with the HyFlex model. It aims to identify gaps that can be addressed positively based on the research outcomes. The contents of this chapter are organised into three main themes. First, it examines the factors affecting the user experience on the HyFlex model. The second theme explores the challenges faculty members and learners face when using the HyFlex model. Finally, it investigates the user satisfaction level with the HyFlex model.

3.2. Factors Affecting the UX on the HyFlex Model

3.2.1. Technological Infrastructure

The quality and accessibility of technological infrastructure significantly impact the UX on the HyFlex Model, and the seamless integration of in-person and online learning modes.

Several studies have stated that careful consideration of the technical setup of a hybrid learning environment is essential (Detyna et al., 2023; Feubli et al., 2023; Kohnke & Moorhouse, 2021; N. J. Mentzer et al., 2023; Nweke et al., 2022; Raes, 2022). Those studies asserted that technology infrastructures are particularly crucial for facilitating synchronous learners. According to a study by Detyna et al. (2023), it was stated that designing and setting up an appropriate technological environment will ensure equal opportunities for learners who are physically present, as well as those in online spaces, to enhance their educational experience and engagement. This idea was further supported by another study, which claimed that placing audio-visual equipment at strategic locations ensures better visibility and audibility for online learners (Detyna & Koch, 2023, p. 6). Research conducted by Kohnke and Moorhouse (2021) and Nweke et al. (2022) found that low bandwidth and the poor strength of Internet connectivity negatively affect learners' ability to achieve their educational objectives. Almaiah and Alismaiel (2019) reported the importance of utilising user-friendly tools and applications to enhance interactivity and the efficiency of the learning environment. Additionally, it was stated that most learners utilise mobile devices for their training requirements (Nweke et al., 2022, p. 10128). Therefore, adequate tailoring of the technology to target such devices is vital. The results of Raes (2022) study confirmed that the effectiveness of the remote experience will depend on the successful design of the learning space. In conclusion, enhancing tools, technologies, and infrastructure to set up the HyFlex model is essential for ensuring an equal UX across different learning modes.

3.2.2. Instructional Design

The reflective and adaptable instructional design strategies and engagement methods will facilitate collaborative learning experiences across diverse learning modes. According to a study by Detyna et al. (2023, p. 157) stated the importance of understanding learner differences and organising materials to ensure an inclusive learning environment for all students. Moreover, the study elaborates that the cognitive burden on learners can be managed through the appropriate blend of instructional design strategies. Similarly, this concept is further supported by Rapanta et al. (2020), who asserted that creating content requires adherence to a rich set of design methodologies to align with student expectations and enhance engagement with the content. It also stated that materials in the HyFlex model should facilitate flexible interaction between

learners and content, to ensure content accessibility for all. The research conducted by Almaiah and Alismaiel (2019) found that learners are more comfortable using mobile devices and associated software for online learning. The study also reported that it is essential to make necessary adjustments to ensure that the content is optimised for such devices and to restructure the content to accommodate various devices. Detyna and Koch (2023) revealed that participants in the research expressed both positive and negative views on the acceptance of mixed group activities, which involve interaction between physical and online learners. The authors also reported that the success of this interaction is influenced by the type of programme offered (Detyna & Koch, 2023, p. 8). As an outline, content tailoring emerges as a crucial factor in fostering meaningful collaboration among participants and ensuring expected interactions, thereby guaranteeing a balanced UX for all types of learners.

3.2.3. Learner Engagement

The level of learner engagement plays a fundamental role in shaping the user experience on the HyFlex Model, impacting outcomes such as knowledge retention, and overall satisfaction with the learning process. Several studies have highlighted the significance of both learner-learner and learner-teacher engagement in achieving the expected level of collaboration and deriving maximum benefits and UX from utilising the HyFlex model in educational institutions (Detyna & Koch, 2023; Dumford & Miller, 2018; Heilporn & Lakhal, 2021; Kohnke & Moorhouse, 2021; Lakhal et al., 2021; Shu & Gu, 2018). However, research conducted by Dumford and Miller (2018, p. 459) asserted that online participants may experience fewer engagement opportunities due to feelings of isolation. Similarly, Detyna and Koch (2023, p. 6) reported a similar phenomenon, stating that online students may be ignored by those physically present in the classroom. Therefore, the virtual classroom environment may present some level of challenges for engagement, interaction, and collaboration among learners. Shu and Gu (2018) found that during online mode, interaction is primarily controlled by individuals, while in-person mode it is handled by educators. Both the studies by Detyna and Koch (2023) and Kohnke and Moorhouse (2021) claimed that their research participants were eager to actively engage while learning in the HyFlex model to achieve their educational goals. Additionally, Detyna and Koch (2023, p. 6) stated that online learners admired their teachers' commitment to keeping them involved during the learning process. Likewise, Feubli et al. (2023) and Lakhal et al. (2021)

identified maintaining an adequate level of engagement as a key factor in achieving success with the HyFlex model. Overall, the level of user engagement in hybrid-flexible delivery modes ensures the UX and satisfaction with the model.

3.3. HyFlex Model Challenges for its Users

3.3.1. Technological Proficiency

The challenges related to technological proficiency among both educators and learners encompass technical difficulties and preventing equitable access to the learning process. Detyna et al. (2023) and Almaiah et al. (2020) argued that ongoing support and training provided for educators are crucial for ensuring their technical competency, which is an important aspect of accomplishing tasks related to blended delivery. Moreover, some of the research participants stated that the instructors' digital literacy can cause challenges for meeting online learners' expectations (Athens, 2023, p. 1779). This idea is further confirmed by Ohanu and Chukwuone (2018), who demonstrated that inadequate training and lack of technical ability among educators present challenges for institutions offering HyFlex courses. N. J. Mentzer et al. (2023) found that, same as educators, learners need requisite skills and support to navigate and access digital course content, thus mitigating burdens for others during synchronous learning. Similarly, both students' and faculty members' technical abilities and the availability of support in resolving issues can impact the quality of the educational system (Alkubaisi et al., 2022, p. 118). However, Detyna and Koch (2023) reported that students participating in-class had a frustrating experience due to staff members' lack of technical ability in managing the online student population. Furthermore, the study reported that staff members with technical skill shortages require additional support from the team facilitating the HyFlex model. It also highlighted the importance of providing sufficient training for them before proceeding to the actual sessions (Detyna & Koch, 2023, p. 8). Lakhali et al. (2021) identified the importance of providing training for learners during orientation programmes to acquire the skills necessary for using digital tools and technologies that is essential for successful achievement of their learning outcomes. In conclusion, possessing operational and troubleshooting skills for hardware and software is essential for meeting the objectives of the HyFlex model while minimising the technological challenges.

3.3.2. Pedagogical Adaptation

The ineffective utilisation of diverse instructional method and failure to facilitate interactive learning experiences present significant challenges. Several studies have emphasised the importance of dynamically tailoring content and teaching methods to adapt to various learning environments (Athens, 2023; Detyna & Koch, 2023; Detyna et al., 2023; Dumford & Miller, 2018; Kohnke & Moorhouse, 2021; Ohanu & Chukwuone, 2018). Both Kohnke and Moorhouse (2021) and Ohanu and Chukwuone (2018) have stated that providing appropriate training and support for educators to enhance their confidence in adapting to hybrid delivery courses will establish a suitable foundation. They further asserted that this foundation enables educators to adjust content and delivery techniques more effectively for both offline and online learners. Furthermore, Kohnke and Moorhouse (2021, p. 241) reported that these trainings will ensure educators gain better confidence and prepare the LMS contents to be more accessible, thereby facilitating smoother knowledge transition for learners. However, the study by Dumford and Miller (2018) found that educators tend to invest more time, experiment with alternative techniques, and implement efficient training procedures to tailor the online learning experience to the needs of learners. Members of Electronic Learning (e-Learning) environments have stated facing challenges related to retaining focus and engagement (Alkubaisi et al., 2022, p. 118). Additionally, Ohanu and Chukwuone (2018) asserted that introverted teachers may have fewer teamwork skills, which could impact the expectations of the blended learning model. However, Athens (2023) argued that achieving success in grouped learning can be challenging due to the mixed set of learning modes offered. Detyna et al. (2023, p. 155) identified the importance of integrating an Audio Visual (AV) specialist to enhance the pedagogical approach of educators. Overall, the pedagogical adaptation and the steps taken to overcome the challenges can ensure an interactive education platform for everyone.

3.3.3. Other Issues

The implementation of the HyFlex model introduces a range of challenges for users, primarily linked to technological issues, thereby influencing their capacity to engage optimally across varied learning contexts. Ohanu and Chukwuone (2018) revealed that regular technological breakdowns disrupt the standard use of the HyFlex model, disturbing online users'

access to sessions and associated materials. The study conducted by N. J. Mentzer et al. (2023) and Nweke et al. (2022) stated that insufficient Internet connection bandwidth can distract communication and obstruct accessibility to resources and content. A similar view is reported that weak Internet connections can discourage learners from meeting educational expectations, consequently diminishing their motivation (Alkubaisi et al., 2022, p. 118; Ohanu & Chukwuone, 2018, p. 14). N. J. Mentzer et al. (2023) reported that the utilisation of user-friendly software leads to a positive UX. Furthermore, they suggested that employing software with lower hardware resource consumption enables users to access online content using low-end devices. Another study by Almaiah et al. (2020) asserted that addressing the social issues of learners can encourage their utilisation of online learning platforms for academic purposes. Therefore, meeting the demanding requirements of learners can ensure they begin to feel comfortable using flexible approaches during their educational journey. It has been claimed that learners find it challenging to maintain attention on their teachers when they move around the class, as the devices placed in the learning environment are fixed to a single location and oriented towards a central point (Detyna & Koch, 2023, p. 8). Ohanu and Chukwuone (2018) found that the additional workload created by the requirement to alter content to match online demands, coupled with less appreciation, can demotivate educators. Anxiety and lack of motivation introduce some psychological barriers that can impact the learning quality of students (Athens, 2023; Lakhal et al., 2021). In conclusion, technological and social challenges can interfere users from achieving their functional expectations using the HyFlex model.

3.4. Factors Affecting the User Satisfaction on the HyFlex Model

3.4.1. Technological Reliability

The level of technological reliability plays a crucial role in determining user satisfaction with the HyFlex Model, as consistent access directly impacts the smoothness of learning experiences. Almaiah et al. (2020, p. 5273) asserted that technological reliability ensures user satisfaction with online learning approaches. Moreover, they revealed that current online learning platforms exhibit concerns regarding accessibility, availability, and usability, which subsequently impact user satisfaction. The authors also confirmed that system acceptance is contingent upon ease of use (Almaiah et al., 2020, pp. 5273, 5274). Furthermore, they

highlighted that ensuring system privacy and security enhances user confidence and guarantees model acceptance. Almaiah and Alismaiel (2019) and Kohnke and Moorhouse (2021) and N. J. Mentzer et al. (2023) collectively addressed essential features that can contribute to the acceptance of learning models, consequently leading to higher user satisfaction rates. The study by Kohnke and Moorhouse (2021, p. 239) confirmed that a wide range of rich software system features ensures the achievement of user interaction and collaboration during course activities, which can enhance user satisfaction. A similar idea is presented by N. J. Mentzer et al. (2023, p. 24), who additionally addressed that the use of special software and features will accommodate differently abled students as well. It helps to successfully fulfil UN SDG Goal 4 - Equal Access for everyone. Almaiah and Alismaiel (2019) demonstrated the necessity of customising materials and context for mobile devices, primarily focusing on the needs of synchronous learners. In summary, the literature underscores the significance of achieving user satisfaction and highlights its potential benefits for the broader domain of learning modes.

3.4.2. Pedagogical Effectiveness

The alignment of instructional strategies with learning objectives, the promotion of active engagement, and the facilitation of meaningful interactions contribute significantly to learners' expected value and success in the hybrid learning environment. Numerous studies have explored effective approaches that can be integrated into the learning content building process to facilitate successful knowledge transfer from educators to learners (Abusalim et al., 2020; Kohnke & Moorhouse, 2021; Lakhal et al., 2021; Raes, 2022; Rapanta et al., 2020; Shek et al., 2022). Raes (2022, p. 155) asserted that a significant majority of the student population confirmed that educators' actions positively impact students' knowledge and understanding across diverse delivery methods. A similar concept is articulated by Lakhal et al. (2021), who suggested that incorporating student evaluations through end-of-module quizzes not only facilitates interaction but also serves as a feedback mechanism for refining strategies in introducing relevant content. The study conducted by Kohnke and Moorhouse (2021) demonstrated the necessity of redesigning course content to accommodate synchronous learners. Providing sufficient training for faculty members can significantly improve their capacity to develop course content, leading to higher levels of learner satisfaction and acceptance (Abusalim et al., 2020). Furthermore, the authors argued that the extent of faculty training correlates with perceptual shifts towards

student-led and student-centred pedagogies. Shek et al. (2022, p. 2854) found that student participants expressed satisfaction with the teaching staff's dedication, attributing it to well-designed mixed lecture formats, which promote interaction and ensure overall benefits. To ensure user satisfaction, Rapanta et al. (2020) posited refined teaching presence, which involves considering students' preparedness for sessions, maintaining appropriate communication channels to enhance interactions, and delivering quality education through the use of various tools and techniques. In conclusion, the acceptance of the HyFlex model depends on the pedagogical effectiveness of the programmes.

3.4.3. Flexibility in Learning Modes

The extent of flexibility in learning modes is a key determinant of user satisfaction, as the ability to seamlessly transition between in-person and online modes, directly impacts learners' convenience and overall satisfaction with their educational journey. Several studies have collectively reported the advantages of offering flexibility in programmes through a range of delivery methods, where students have the option to select the most suitable participation method based on their circumstances (Almaiah & Alismaiel, 2019; Athens, 2023; Baragash & Al-Samarraie, 2018; Detyna & Koch, 2023; Feubli et al., 2023; Kohnke & Moorhouse, 2021; N. Mentzer et al., 2023; N. J. Mentzer et al., 2023; Nweke et al., 2022). Both Detyna and Koch (2023) and Nweke et al. (2022) confirmed that learners can switch between different learning modes based on changes in their personal situations. Therefore, learners can continue learning without distraction, even when their life conditions and preferences change. Baragash and Al-Samarraie (2018) reported that 40.71% of students accessed recorded sessions asynchronously due to the flexibility of hybrid setup, resulting in enhanced understanding of course materials and contents. Online learning environments can enhance content accessibility in their own time and place, offering learners the freedom to access the latest context with ease, thereby ensuring flexibility to meet the diverse needs of them (Almaiah & Alismaiel, 2019, p. 903). Athens (2023) identified that factors such as family commitments, work nature or schedule changes, and health matters enable students to choose their most convenient method of participating in learning sessions, thereby allowing for greater flexibility. Similar idea is asserted by Feubli et al. (2023) and Kohnke and Moorhouse (2021), and N. J. Mentzer et al. (2023). In conclusion, the flexibility

of switching between learning modes is a crucial aspect of the HyFlex model for successfully achieving the educational objectives of learners.

3.5. Summary

This literature review focuses on summarising existing research and scholarly work related to the HyFlex model, user experience, and satisfaction in educational settings. The contents of this chapter carefully synthesise information from studies conducted by Athens (2023), Detyna et al. (2023), Feubli et al. (2023), Kohnke and Moorhouse (2021), (N. Mentzer et al., 2023), (Raes, 2022), (Shek et al., 2022), and others. First, it discusses the impact of factors such as the technological infrastructure used in the classroom and learning environment, instructional design approaches employed by educators, and effective methods for maintaining learner engagement in UX. Next, it explores the challenges faced by users due to varying technological proficiencies, the need for educators to adapt pedagogically, and technological barriers and other issues. Finally, it examines factors such as technological reliability, the pedagogical effectiveness of strategies utilised, and the flexibility of switching between different learning modes, all of which can influence user satisfaction. Overall, the literature review chapter provides a comprehensive understanding of the existing knowledge base and establishes the foundation for the research to be conducted at SIT Invercargill Campus.

Chapter 4. Methodology

4.1. Introduction

This chapter elaborates on the overall research methodology and discusses the roadmap of the research study. The contents of this chapter are organised into six different sections. Section 4.2 explores research philosophy and design, covering aspects of choosing the appropriate philosophy for the research. The study relied on an interpretivist philosophy and used a descriptive method. Detailed explanations are provided for each of these methodological choices. Sections 4.3 and 4.4 will discuss factors related to employing the survey approach for data collection. They will also cover the relevance and procedure of using a questionnaire to examine student perspectives, along with semi-structured interviews to gather meaningful insights from faculty members. Furthermore, each technique will be detailed with purposes and procedures followed for data gathering, including population details and the ideology behind sample sizes and participants, as well as describing the data analysis methods chosen under each technique. Section 4.5 will critically examine the limitations of the study and the reliability and bias coupled with the data gathering process. Aspects of the ethical framework followed during the process will be covered in section 4.6, including details such as ethics application and the approval letter granting to conduct this research. Additionally, it will cover the approach to mitigate ethical issues due to deviation from ethical standards during the process. Section 4.7 summarises all the information related to the research methodology to link the key points with the next chapter.

4.2. Research Philosophy and Design

This research focuses on examining the user experience and satisfaction of the HyFlex model's different learning modes among both students and faculty members. The selection of an appropriate research philosophy plays a crucial role in determining the successful achievement of research outcomes. In general, the research philosophy refers to the set of theories, principles, and norms that support a researcher's approach to conducting the study (Saunders et al., 2023, p. 131). The chosen research philosophy will define the overall approach to conducting the research (Creswell & Poth, 2018, p. 15). Therefore, it outlines the researcher's perspective on the nature

of knowledge, the role of the researcher, and the methods used to gather and interpret data (Saunders et al., 2023, p. 131). The study aims to explore human experiences and emphasises understanding individuals’ perceptions, behaviours, and interactions within their social contexts. Utilising an interpretivist viewpoint enables an in-depth exploration of how users interpret and engage with their environment, facilitating a deeper understanding of their unique perspectives. (Blaxter et al., 2010, p. 61). In the context of the HyFlex model, with its flexible learning environment, interpretivism philosophy enables researchers to gain detailed insights into individuals’ experiences and perceptions of different learning modes. Therefore, exploring user experience and satisfaction within the HyFlex model aligns well with interpretivism philosophy. Table 2 illustrates the relationship between the chosen research philosophy, research design, and other methodological choices.

Table 2
Overview of the Research Philosophy and Design

Research Philosophy	Overall Approach	Design	Method(s)	Role of Researcher	Kind of Data Collected	Intended Analysis
Interpretivism	Descriptive	Survey	Questionnaire and Interviews	Involved	Mixed-Methods	Inductive

The descriptive approach increases the likelihood of gathering insights into individuals, their circumstances, and the events that can occur within a specific environment (Collis & Hussey, 2021, p. 5; Saunders et al., 2023, p. 180). Therefore, this study focuses on employing the descriptive approach, which enables the examination of how students and faculty members perceive the working conditions of various learning modes in the HyFlex model to meet their needs. Typically, surveys are structured around questions and are well-suited for obtaining a broader, comprehensive view of a specific context (Densombe, 2014, p. 8). To capture users’ perceptions about the HyFlex model, this study employs a survey method. Surveying approach

provides a broad opportunity to gather users' perspectives on flexible learning and to explore the challenges they have encountered, thereby contributing to understanding their user experience and level of satisfaction. Qualitative studies are appropriate for social research when the goal is to identify individuals and their behavioural associations within a specific context without altering or compromising the collected data (Densombe, 2003, pp. 267, 268). Furthermore, it is ideal to explore the problem rather than relying solely on the existing Body of Knowledge (BoK) provided by the literature to predetermine solutions (Creswell & Poth, 2018, p. 47). The authors also emphasised the importance of gaining a detailed understanding of specific contexts rather than depending exclusively on previous findings. This study also ensures adherence to the same concept.

Interviews and questionnaires are particularly convenient methods for collecting data within the framework of survey methodology (Densombe, 2014, p. 9). Based on the planned face-to-face interviews, the study gathered the views of faculty members, while an online questionnaire was used to electronically collect responses from student participants. The interviewer could guide the interview to obtain the desired quality of data, thereby increasing the likelihood of collecting the specific details needed for the research (Dawson, 2009, pp. 14, 15; Fowler, 2009, p. 127). Semi-structured interviews offer greater adaptability and flexibility compared to structured interviews, allowing interviewers to clarify unclear or doubtful responses provided by interviewees and uncover additional details as needed (Densombe, 2003, p. 167). The interviews were conducted with this foundation in mind, and the questions were dynamically adjusted to gather valuable data for qualitative analysis. Questionnaires enable participants to provide answers easily, which is convenient for both them and researchers to collect a large amount of responses quickly, efficiently, and cost-effectively (Densombe, 2003, pp. 144, 145). The questionnaire was implemented using Google Forms and distributed to students via SIT's global distribution, providing online, electronic access for learners to easily record their responses. The questionnaire primarily included closed-ended questions with numerical scales aimed at quantitative analysis, supplemented by a few open-ended questions designed to gather feedback on participants' perspectives regarding the hybrid-flexible learning approach. For qualitative research, questionnaires that incorporate open-ended questions are suitable for obtaining detailed opinions and experiences from participants (Deakin University, n.d.). However, the mixed-methods approach focuses more on problems than on theories (Densombe,

2014, p. 160). Therefore, the questionnaire is organised around a mixed-methods approach to collect both quantitative and qualitative data for the research.

Interviews extend beyond typical conversations, especially in the semi-structured format where the researcher's involvement is particularly intensive (Densombe, 2003, pp. 163, 167). It has also been noted that in qualitative studies, the interpretation and presentation of information are largely controlled by the researcher (Densombe, 2003, p. 268). In this study, the interviews were structured around ten standard questions aligned with the research objectives. However, to gather sufficient reliable and in-depth information, both the sequence and content of the questions had to be adjusted. As a result, the researcher's role was more hands-on and involved in guiding the interview process. A deductive approach moves from general principles to specific conclusions or details, contrasting with the inductive approach which moves from specific observations to broader generalisations (Collis & Hussey, 2021, pp. 7, 8). The authors also explained that the inductive analysis process starts with data collection, where researchers aim to identify patterns (categories), themes, or generalised findings based on the collected data. For analysing qualitative data, thematic analysis, will be employed as a widely accepted method (Saunders et al., 2023, p. 664). Finally, the overall information gathered using mixed-methods will be analysed using an inductive approach. The research employed both qualitative and quantitative data analysis, adopting an inductive approach to uncover specific patterns within the collected data. In conclusion, the selected interpretivism research philosophy and the mixed-methods research design, which was based on surveys and other associated techniques, exhibit the relationship between the research and the methodological selections.

4.3. Method 1: Questionnaire

4.3.1. Purpose of the Questionnaire

To effectively understand student perspectives, it is crucial to gain a comprehensive understanding of their experiences within their educational environment (Ramsden, 2003, p. 6). Therefore, exploring students' beliefs and expectations regarding different learning methods in a HyFlex setting can yield valuable insights into the challenges they encounter, thereby assisting educators in improving their teaching techniques accordingly. Additionally, ensuring the

adaptation of delivery methods and practices based on students' cognitive abilities and social needs can enhance the educational experience for learners, employing a constructive approach (Fry et al., 2009, p. 9). While assessing these factors, a questionnaire can be employed to identify the factors influencing students' user experience and the challenges they encounter when utilising various learning modes in a HyFlex environment.

Compared to other data collection techniques, employing a questionnaire allows the researcher to distribute it to a larger population of student participants, thereby increasing the likelihood of gathering a significant amount of data within a shorter timeframe (Dawson, 2009, p. 32). The research designed using a survey method can be easily implemented through the use of a questionnaire (Kuada, 2012, p. 107). The primary purpose of using a questionnaire aligns with the interpretivism philosophy because understanding the subjective interpretations of individual learners within their social contexts is crucial for assessing their satisfaction levels and user experience with the HyFlex model. Therefore, the questionnaire can be utilised to capture both quantitative and qualitative data, focusing on the personal perspectives of learners. The data collection process using the questionnaire focused on 50 to 60 students who were enrolled in programmes offered using the HyFlex model at the SIT Invercargill campus and had prior experience with the HyFlex setting. Additionally, open-ended questions formatted with words like "what," "who," and "how," which are descriptive in nature, can be analysed qualitatively (Saunders et al., 2023, pp. 194, 195). Overall, the responses to questions formulated in closed-ended and open-ended manner are intended to be analysed using a mixed-methods approach.

4.3.2. Questionnaire Design

Designing a balanced questionnaire with clear, meaningful, unambiguous, and relevant questions is crucial for maximising insights from participants in the research (Kuada, 2012, p. 107; Saunders et al., 2023, pp. 523, 524). Therefore, it determines the effectiveness of the questions and is directly correlated with the effort participants must use to provide answers. Additionally, it is essential to maintain a professional approach during the questionnaire design process, as it directly affects the response rate (Kuada, 2012, p. 107).

Since there was no existing questionnaire suitable for this research, a new questionnaire was developed, incorporating both closed-ended questions (to focus on quantitative data) and

open-ended questions (to focus on qualitative data). According to the literature, open-ended questions allow for detailed insights, whereas closed-ended questions provide concise and direct information from the responses (Rosala, 2024). Therefore, the inclusion of some open-ended questions will ensure a comprehensive range of opinions from learners.

The header section of the questionnaire includes an informative summary outlining the purpose of the survey, which provides students with necessary information about the research context and the estimated time required to complete the questionnaire. The questionnaire was divided into several sections to give participants an overview of the related questions and help them understand the relevance of each section to their experience with different learning modes. Additionally, questions specific to each section were included to gather data on both physical classroom and online classroom environments, covering both synchronous and asynchronous learning settings. More details about the questionnaire can be found in **Appendix C**. Prior to its release, the questionnaire underwent pilot testing, and necessary corrective actions were taken based on the feedback received.

4.3.3. Pilot Testing

Pilot testing a questionnaire is a crucial step before proceeding to the actual data collection phase, ensuring that questions are error-free and providing insights into the time required to complete the questionnaire (Saunders et al., 2023, p. 548). In this study, the questionnaire was distributed online to five Master of Applied Management (MAM) students for pilot testing, and their feedback was used to assess the validity and accuracy of questionnaire sections and questions.

One participant noted the flow between sections and emphasised the importance of allowing participants to skip certain questions based on preceding entry questions, especially in sections that are not relevant to them. Additionally, setting all questions as optional revealed the possibility for participants to complete the questionnaire without providing valid responses to important questions. After carefully considering the feedback, necessary actions were taken to rectify these issues. Subsequently, the questionnaire was made available to the intended target population.

4.3.4. Procedure

This research primarily focused on SIT Invercargill campus students with experience in the HyFlex learning model. To reach the intended questionnaire participants, a request was made to the authorising body to publish the questionnaire Uniform Resource Locator (URL) and Quick Response (QR) code via SIT's global distribution channel. The questionnaire was made available to respondents from Monday, 13 May 2024 for a period of four weeks from the published date. The data gathering period was extended by an additional two weeks due to the lack of responses compared to the expected target. Additionally, faculty members who participated in the interviews were requested to encourage their students to participate in the research questionnaire to expedite the process.

4.3.5. Participants and Sampling

The questionnaire participants were students from SIT Invercargill campus who had some form of experience with the HyFlex model and had enrolled in any course or paper offered through different learning modes in HyFlex. There were no age constraints for students, but the mandatory requirement for participation was having experience in the HyFlex environment. Students served as primary stakeholders in the HyFlex learning space, contributing valuable knowledge to meet the research objectives. In this research, a sample of 50 to 60 students was targeted for the questionnaire.

The collected data must be relevant to the type of study and should be gathered purposively (Creswell & Poth, 2018, p. 147). Self-selection sampling promotes volunteer contributions to data gathering, allowing participants the freedom to decide whether or not to take part in the research (Saunders et al., 2019, p. 323). Additionally, convenience (volunteer) sampling provides an easy, cost-effective, and efficient method of approaching participants for research (Gill, 2020, p. 580). However, the author revealed a downside to this approach: participants may not always provide the most accurate and relevant information for the study. This study adhered to the same principles, inviting students to participate voluntarily in the survey while ensuring their anonymity and the confidentiality of their data. During the period of six weeks, 52 student responses were recorded.

Following are some demographic details that have been identified based on actual data collected through the questionnaire.

Age and Gender

Out of the 52 total responses, it was observed that all respondents were between the ages of 16 and 49; there were no participants aged 50 and above. There were 26 female students, 25 male students, and 1 participant who preferred not to disclose their gender.

Highest Educational Qualification

Based on the collected responses, it is revealed that the highest percentage, 34.62%, of students hold a high school qualification. The second largest group consists of 11 out of 52 students who already possess a bachelor's degree before enrolling in a programme offered via the HyFlex model at SIT.

Occupation

Out of the sample of 52 respondents, 22 students (42.31%) identified themselves as full-time employed and 28.85% as part-time employed.

4.3.6. Data Analysis

Quantitative analysis, grounded in mathematical foundations, allows findings to be examined in statistical form (Babbie, 2007, p. 450). The use of numeric scales in questions enables researchers to describe data using single variables or to explore associations between sets of variables (Babbie, 2007, p. 450). When assessing the key findings, it facilitates the opportunity to categorise the data rather than individual interpretations. (Densombe, 2003, p. 251). Additionally, closed-ended questions can be processed quickly due to the consistency of responses (Babbie, 2007, p. 246). Therefore, closed-ended questions are advantageous in analysing HyFlex model student perceptions of user experience, challenges encountered, and satisfaction using 5-point Likert scale responses. Open-ended questions yield rich qualitative data but require more time and effort for analysis (Densombe, 2003, p. 156). Moreover, qualitative responses necessitate categorising data based on common themes or patterns

(Densombe, 2003, p. 272). Prior to thematic analysis, data must be coded to organise similar ideas (Saunders et al., 2023, p. 666). An inductive analysis approach will be employed to group data and formulate generalised interpretations. In conclusion, questionnaire data in both quantitative and qualitative forms will be analysed using descriptive statistics and thematic analysis, respectively.

4.4. Method 2: Interviews

4.4.1. Purpose of Interviews

Interviews generally function as purposeful conversations between the interviewer and interviewees, facilitating real-time meaningful interactions using natural language (Rugg & Petre, 2007, p. 135). Furthermore, due to the prominent role of the researcher, interviews offer enhanced opportunities to gather high-quality data specific to the study (Fowler, 2009, p. 127). Moreover, interviews are inherently more adaptable and task-oriented, allowing for adjustments in interaction style and format based on participant feedback and concerns (Fowler, 2009, p. 128). Researchers argue that conducting face-to-face interviews can increase response rates compared to other survey methods (Densombe, 2003, p. 8). Evaluating these factors highlights that interviews provide flexibility in tailoring the process to gain insights from faculty members regarding their perspectives on using the HyFlex model for teaching.

The cost of conducting interviews and the effort required to access potential interviewees are generally higher compared to other survey methods such as questionnaires (Densombe, 2014, p. 185). However, in this study, the research is conducted on-site where faculty members deliver their courses, which provides the researcher with access to most of the research population and helps overcome this issue. Additionally, focusing solely on student perspectives would exclude other key stakeholders, such as faculty members, from contributing to the research data collection. This could lead to an imbalanced outcome in the research findings. Furthermore, employing semi-structured interviews ensures adherence to an interpretivist philosophy, allowing the research to develop standardised questions based on themes derived from the research aims and objectives (Saunders et al., 2023, p. 444). To address these considerations, the interview

process focused on 6 to 8 faculty members who have already conducted lessons using the HyFlex model at the SIT Invercargill campus.

4.4.2. Interview Design

Semi-structured interviews are characterised by their open-ended nature, enabling interviewers to dive deeply into responses, clarify doubts, and introduce new questions as needed (Densombe, 2003, p. 167). This flexibility is particularly advantageous when exploring faculty members' views and experiences with the HyFlex model, as it allows for a meaningful conversation and the ability to link subsequent questions based on earlier responses. The initial interview was structured with 10 questions; however, throughout the interview sessions, several tailored and new constructive questions were introduced to accommodate the dynamic nature of the interviews. Moreover, this format allows for the reordering of questions based on participant responses and research objectives or themes, enhancing adaptability (Saunders et al., 2023, p. 444). Conducted in a professional yet free-flowing style, these interviews ensured that participants could express their thoughts naturally, thereby providing meaningful information for the research without unnecessary interruption. Furthermore, the semi-structured approach proved effective within the allocated 40 to 60-minute time frame, efficiently capturing essential viewpoints on faculty members' experiences and concerns regarding HyFlex delivery.

The interview design included an information sheet for faculty member participants, which outlined the purpose of the interview, provided important details about the intended research and the projected time frame of the interview process, and included a consent form for participants to sign if they decided to participate. Additional information about the interview questions can be found in **Appendix D**.

4.4.3. Procedure

This research primarily involved faculty members from the SIT Invercargill campus who have previous experience delivering courses or papers using the HyFlex model. Since the researcher is a part-time tutor at the same organization where the research is being conducted, initial contact was made directly with potential faculty members to obtain verbal consent for participation in the interview process. Faculty members who indicated soft approval were then

provided with a Consent Form and an Information Sheet describing the intended research and the relevance of interview towards meeting the research objectives. The study employed snowball sampling to identify additional suitable faculty members for interviews during data collection. Interviews took place between Wednesday, 24 April 2024, and Friday, 24 May 2024, encompassing 8 productive semi-structured interview sessions. Most interviews were conducted face-to-face in agreed-upon locations such as free lecture rooms or pre-booked meeting rooms at the library, chosen for convenience of the faculty member. One interview was conducted via Microsoft (MS) Teams, accommodating the participant's preference. Prior to each interview, oral confirmation was obtained to audio-record the session, and transcripts were prepared afterward. To ensure the highest level of privacy and security for research data, transcripts were uploaded to a password-protected device. Interview durations varied, with the shortest lasting 25 minutes and 18 seconds, the longest extending to 57 minutes and 4 seconds, and an average duration of 37 minutes and 27 seconds.

4.4.4. Participants

For empirical research, particularly in survey-based studies, it is crucial to purposefully select relevant individuals for data collection (Densombe, 2014, p. 7). Apart from learners, educators represent the other key stakeholders in educational environments. The questionnaire was designed to gather insights from students, while the interview process focused on faculty members. The interview participants were faculty members from the SIT Invercargill campus with experience in delivering courses using the HyFlex model. In recruiting interview participants, there were no specific demographic constraints other than their prior experience with HyFlex delivery being mandatory. The research aimed to interview a sample of 6 to 8 faculty members. Snowball sampling facilitates the process of identifying suitable candidates for gathering data (Densombe, 2014, p. 42). Therefore, during some interviews, participants were asked to suggest other faculty members who could provide valuable insights for future interviews in the study. Within a period of four weeks, a total of 8 faculty member interviews were conducted and recorded for analysis purposes. Investigating not only learners' experiences but also faculty members' perspectives is essential for understanding the challenges they face in their regular practice of delivering courses through various HyFlex modes, which is crucial for achieving the research objectives.

4.4.5. Data Analysis

Thematic analysis involves identifying related patterns by grouping codes together to generate themes, forming the foundation for analytical approach (Braun & Clarke, 2023, p. 1). It provides a systematic method for analysing qualitative data in a logical manner, relating findings directly to the research questions (Saunders et al., 2023, p. 664). In this study, semi-structured interviews conducted with faculty members are intended for thematic analysis, enabling researchers to identify categorised patterns and formulate generalised conclusions. Therefore, the interview process facilitates an inductive approach to data analysis. Researchers can collect data through multiple techniques such as questionnaires and interviews, employing triangulation to obtain a composite view that minimises limitations inherent in each method and enables the identification of optimal solutions relevant to the study (Densombe, 2003, pp. 131, 132). Moreover, triangulation helps mitigate weaknesses in individual methods and strengthens research findings (Babbie, 2007, p. 113). The triangulation approach offers an opportunity to compare and analyse data collected via the questionnaire with data obtained through interviews, thereby deriving meaningful conclusions based on thematically analysed data.

4.5. Limitations, Reliability and Bias

Related to the questionnaire, a significant limitation identified was the challenge of collecting the anticipated number of responses from students within the initial four-week period. This difficulty occurred due to students' limited interest, which was influenced by their previous participation in surveys. Consequently, an additional two weeks were allocated to extend the questionnaire submission period, resulting in a total of 52 responses collected. However, obtaining only 52 responses may not offer a comprehensive view, as they represent a limited number of programmes rather than the entire range of courses offered in the HyFlex model at SIT Invercargill campus. In qualitative data analysis, it is advantageous to include more open-ended questions to investigate deeper into participant experiences. However, this approach can potentially impact participant response rates negatively. This emphasises the need for further research to achieve a more comprehensive coverage of the research objectives. Overall, while the collected data provides valuable insights, the study highlights the importance of expanding data

collection efforts to ensure a more representative sample and gain a deeper understanding of student experiences with HyFlex learning.

Finding eight faculty members proved challenging due to their other work-related commitments, requiring exactly four weeks to complete the expected number of interviews. Upon review, it became apparent that the sample of participants interviewed did not fully represent the diverse range of faculty members experienced in delivering courses across all programmes offered through the HyFlex platform at SIT. This highlighted the need to extend the data collection period significantly to capture a broader range of responses and perspectives from faculty members across all programmes utilising the HyFlex model.

In summary, for a qualitative study using a survey design approach to analyse data thematically, having sufficient data is crucial. However, the data gathering process was completed with a specified count due to uncontrollable time constraints associated with data collection. This clearly emphasises the necessity for extended data collection and future research to obtain comprehensive and conclusive findings about the research topic.

4.6. Ethical Considerations

In ethical dilemmas, research must adhere to correct procedures and accepted principles throughout the process, reflecting the researcher's approach to conducting research activities (Saunders et al., 2023, p. 253). The initial and foremost task is to obtain ethical approval to conduct the research. Following submission of the ethics application and supporting documents, ethical approval was obtained from the SIT Ethics Committee, confirming the study's acceptability. For reference, please see the ethics approval letter in **Appendix A**, and the ethics application can be found in **Appendix B**. Additionally, ethical practices will prevent the use of poor practices and ensure that no harm is caused in any way (Saunders et al., 2023, p. 255). To maintain confidentiality, both questionnaire and interview responses will be stored on a password-protected computer for a period of five years, after which they will be securely deleted.

4.6.1. Method 1: Questionnaire

The questionnaire designed using Google Forms includes a brief introduction serving as an information section summarising the research aims and objectives for participants. It also specifies the estimated time required to complete the questionnaire, allowing students to decide whether to proceed. Participants provide their consent to include their details in the research by submitting their responses. This process operates on implied consent, where students implicitly agree to participate in the study by voluntarily completing and submitting the questionnaire. For further details, please refer to the informative summary in **Appendix C**.

4.6.2. Method 2: Interviews

Prior to the interview process, participants will receive an information sheet introducing the details and purpose of the research, as well as the intended data expected from them. Therefore, interviews will be conducted based on informed consent, where the interviewer ensures that faculty members fully understand the nature of the study. To proceed with data gathering, signed consent will be required from each participant before the interview process begins. The interviewer, who also serves as a part-time tutor at SIT, will identify faculty members for interviews. However, no personal information will be collected during data collection, and in documenting the thesis, faculty member identities will be maintained anonymously. Audio-recordings will only commence after obtaining participants' approval, and transcribed data will be securely maintained and appropriately discarded after use. For further details, please refer to the participant information sheet in **Appendix E**, and the blank consent form can be found in **Appendix F** as well.

4.7. Summary

This chapter outlines the methodological approach used to explore user experience and satisfaction with the HyFlex model at the SIT Invercargill campus. It adheres to an interpretivist philosophy and employs questionnaire and interviews as data collection methods. The survey questions in both methods were designed to collect qualitative responses for thematic analysis, while the questionnaire aimed to gather quantitative responses for descriptive analysis. The questionnaire was carefully designed with a mix of closed-ended and open-ended questions to

encourage students to freely express their views. Pilot testing with 5 students provided valuable feedback, leading to the administration of the questionnaire with 52 responses collected.

Similarly, semi-structured interviews were conducted to capture constructive inputs from faculty members experienced in HyFlex. Eight face-to-face interviews were conducted, allowing for in-depth exploration of educators' perspectives. Researcher maintained control over the interview process, question format, and sequencing, ensuring their active involvement throughout.

Snowball sampling was employed to recruit faculty members for interviews, while students were given the choice to participate voluntarily in the questionnaire, promoting volunteer sampling.

Furthermore, the study utilised an inductive approach to analyse data, exploring responses from the participants to uncover themes and generalise concepts. In conclusion, the collected data, adhering to ethical standards, will be analysed in Chapter 5.

Chapter 5. Findings and Analysis

5.1. Introduction

This chapter aims to present the findings through a mixed-methods analysis based on student data gathered from 52 questionnaire responses, which will be analysed both quantitatively and qualitatively. Additionally, data from interviews with 8 faculty members will undergo qualitative analysis using a thematic approach. The findings will adhere to an inductive approach to data analysis, aiming to discover patterns and themes based on the data and to generate novel generalisations related to the BoK acquired. The contents of this chapter are divided into two main sections: the results section and the discussion section. The results section will present findings separately for each survey data collection method employed at the SIT Invercargill campus, focusing on the research objectives. Quantitative data will be primarily presented in tabular and graphical formats, while qualitative data will be presented in textual formats. After presenting the analysed data, the next section of this chapter will discuss the relevance of the findings and compare them with existing literature related to the HyFlex model. This comparison aims to critically evaluate similarities with previous studies in the same domain and identify any discrepancies between the findings and existing theories. The final part of this chapter will summarise the findings and establish connections between the findings and previous literature.

5.2. Results

5.2.1. *Method 1: Questionnaire*

The questionnaire was structured with a range of 19 to 42 questions, allowing students to select questions relevant to their experiences with different learning modes. It consisted of 40 closed-ended questions and 2 open-ended questions, specifically designed to gather information applicable to the research objectives. More details about the questionnaire can be found in **Appendix C**. The closed-ended questions were analysed using descriptive statistics to provide quantitative insights, while the open-ended questions underwent thematic analysis to uncover

qualitative insights. The following sections present key findings derived from the questionnaire responses.

Gender Distribution

The gender distribution of student participants in the questionnaire is illustrated below (see Figure 1).

Figure 1

Gender Distribution

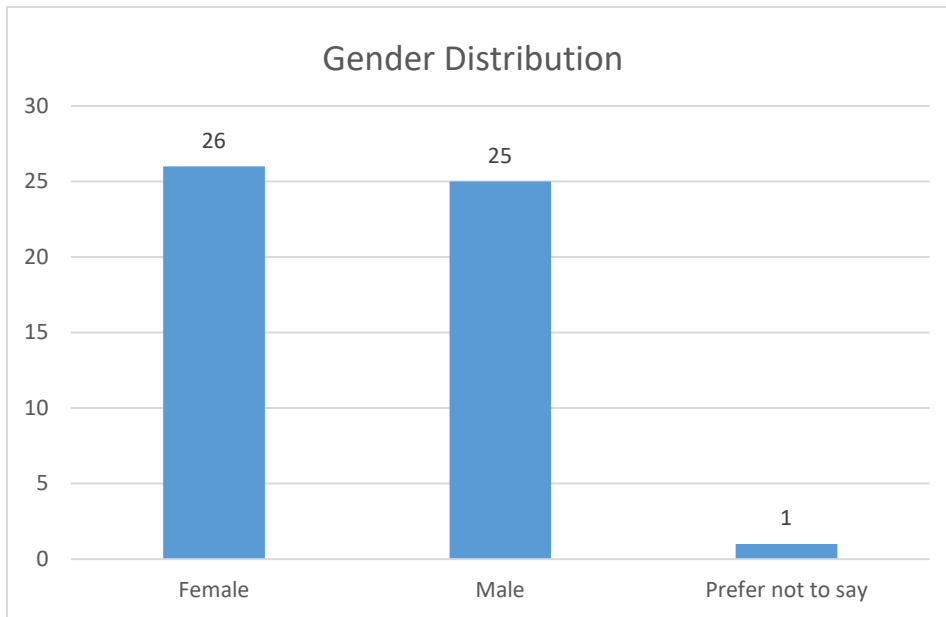


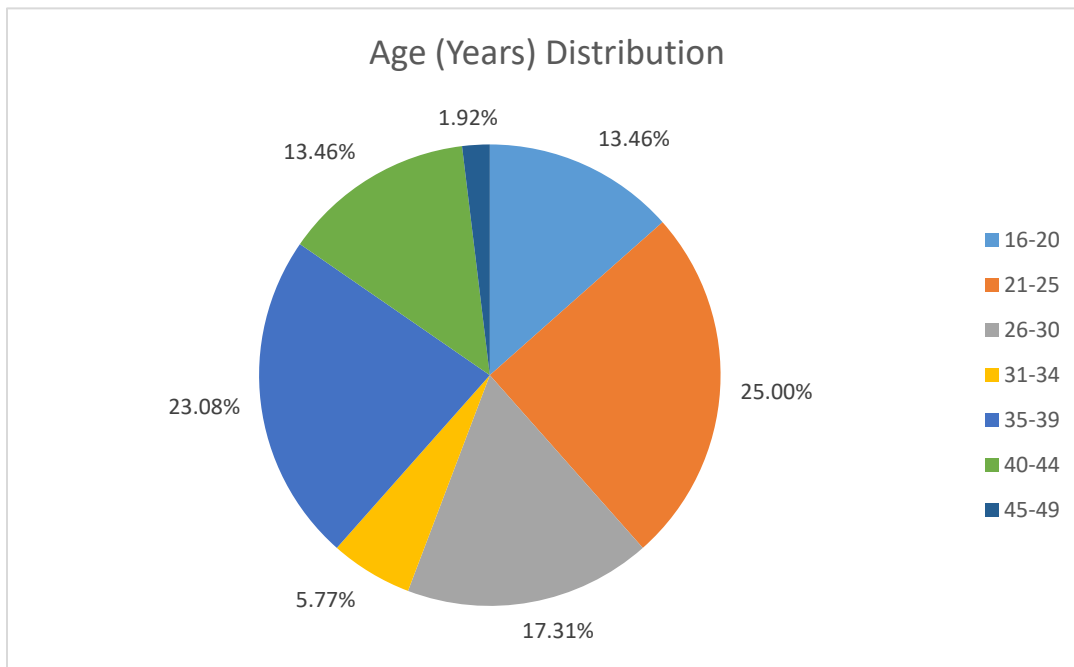
Figure 1 shows that the data confirm no significant difference in student enrolment based on gender in HyFlex courses, indicating that survey results are not influenced by gender preferences.

Age (Years) Distribution

Figure 2 shows the age (years) distribution of student participants in the questionnaire.

Figure 2

Age (Years) Distribution



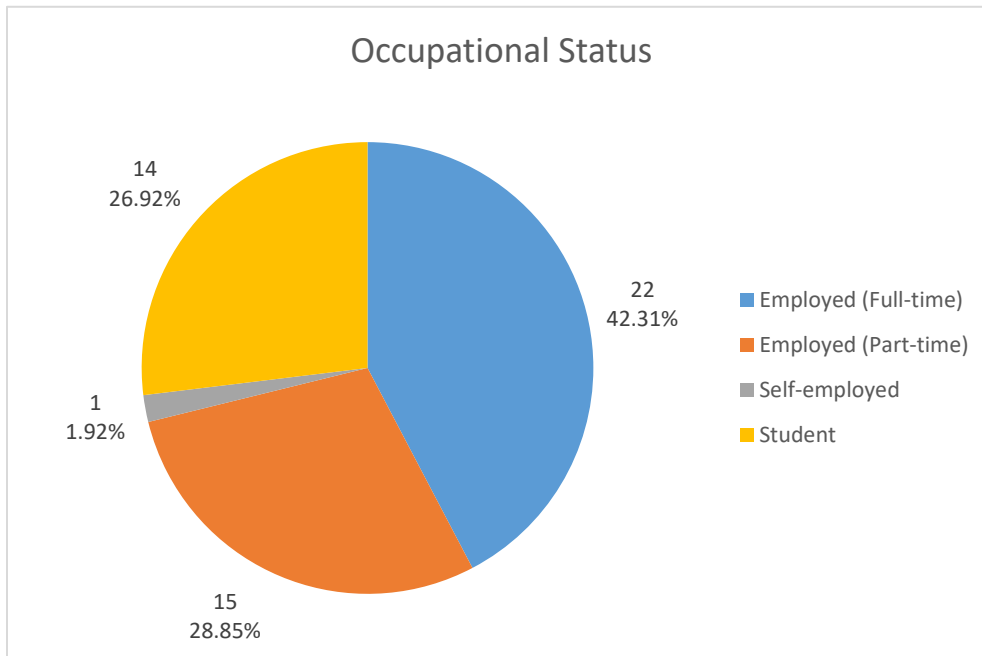
As illustrated in Figure 2, the significant age groups with the largest number of student representations are the 21-25 age category at 25% and the 35-39 age category at 23.08%. Student participants' ages range from 16 to 49 years. Given that these participants cover a wide age range of tertiary education learners, the results can be considered a representative sample of the expected population.

Occupational Status

The occupational statuses of students are illustrated in Figure 3.

Figure 3

Occupational Status



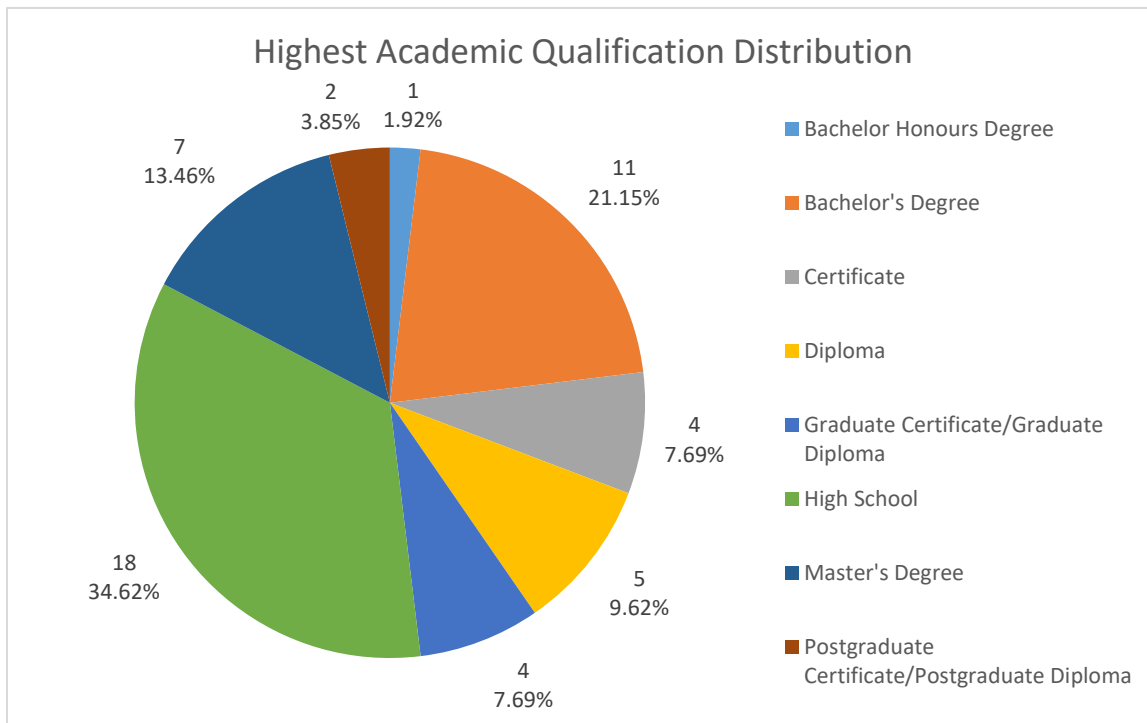
As shown in Figure 3, out of 52 respondents, a significant portion, comprising 71.16% (38 students), are employed in some capacity. This confirms that students' employment status does not affect their learning opportunities, and the HyFlex model enables flexible learning options for them. The remaining 14 respondents are using HyFlex learning as full-time students.

Highest Academic Qualification Distribution

Figure 4 will indicate the distribution of the highest academic qualifications of questionnaire respondents.

Figure 4

Highest Academic Qualification Distribution



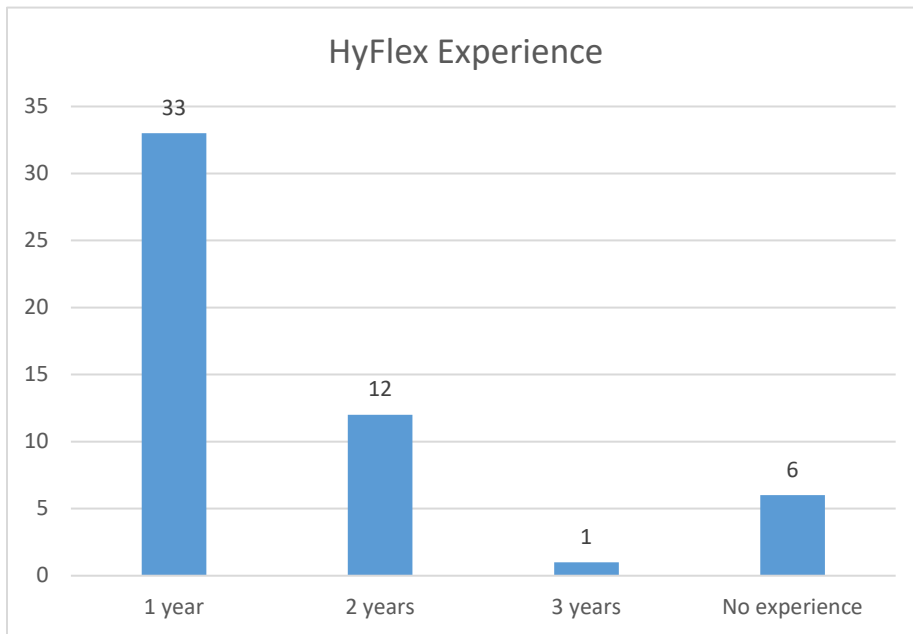
As shown in Figure 4, the majority, comprising 34.62% (18 students), enrolled in HyFlex courses after completing their high school qualifications. The second largest group, accounting for 21.15% (11 students), continued their education even after completing their first degree. The results confirm that the research provides valuable insights from learners across various educational levels.

HyFlex Experience

Figure 5 will illustrate the experience span of HyFlex students who participated in this study at SIT.

Figure 5

HyFlex Experience



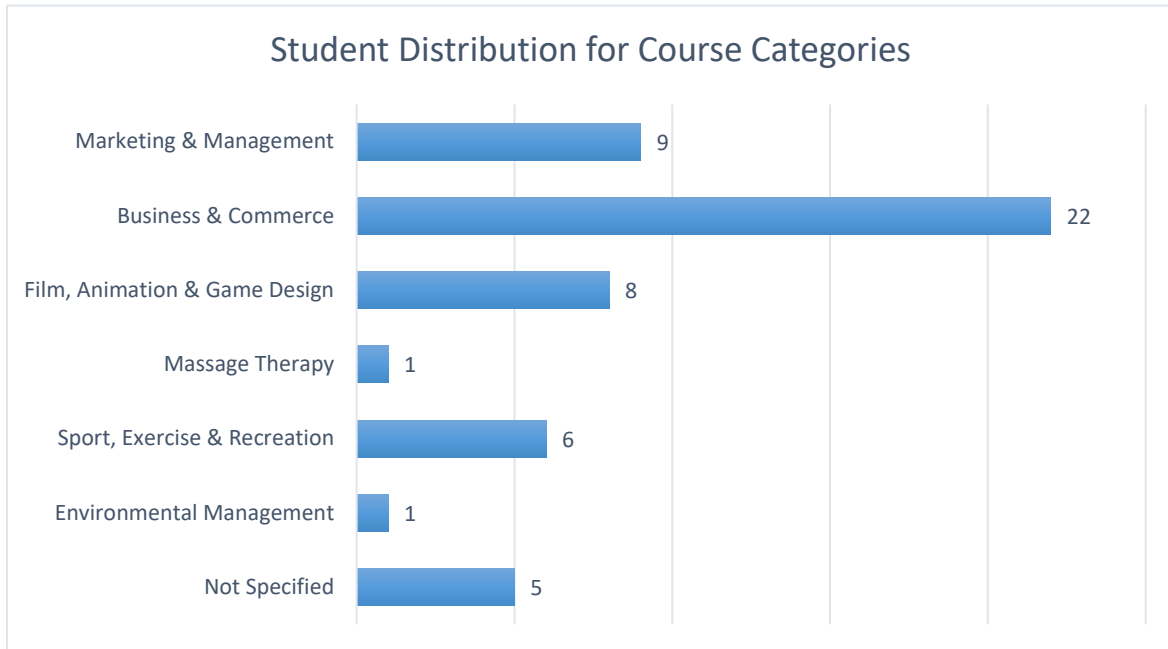
As shown in Figure 5, 46 respondents reported having one year or more of experience with the HyFlex model, confirming that 88.46% of the research results are based on previous HyFlex experience.

Course Category Distribution

Student responses regarding the course(s) in which they enrolled will be categorised as follows (see Figure 6).

Figure 6

Student Distribution for Course Categories



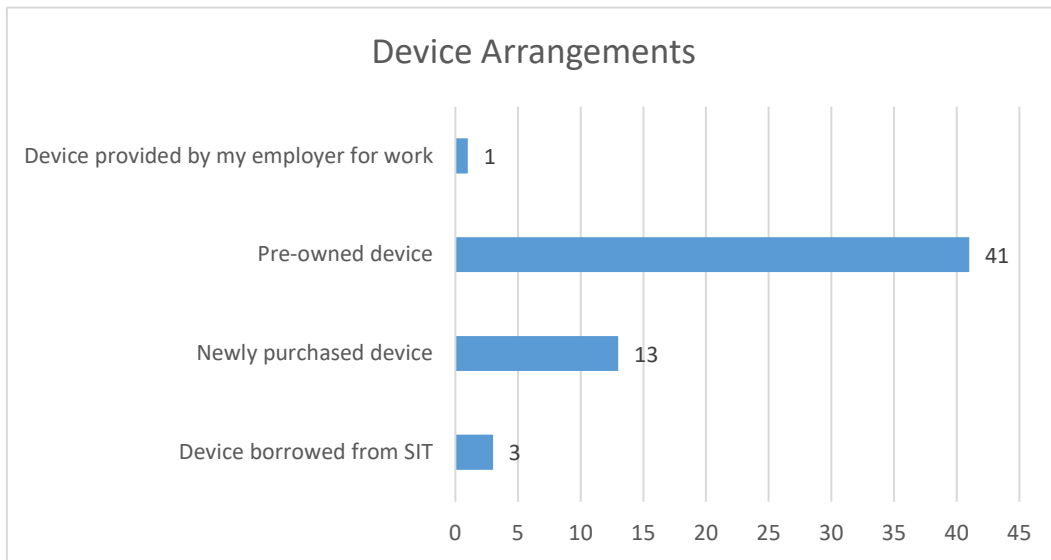
As shown in Figure 6, participants enrolled in various programmes offered under HyFlex are categorised based on the course disciplines. The highest number of participants, 22 students, reported being in Business & Commerce programmes. In contrast, there were comparatively fewer responses for Massage Therapy and Environmental Management courses, with one student each enrolled. Additionally, 5 students did not specify the programme or course they study.

Device Arrangements

Figure 7 illustrates how students arranged their devices to connect with synchronous or asynchronous learning sessions for their studies.

Figure 7

Device Arrangements



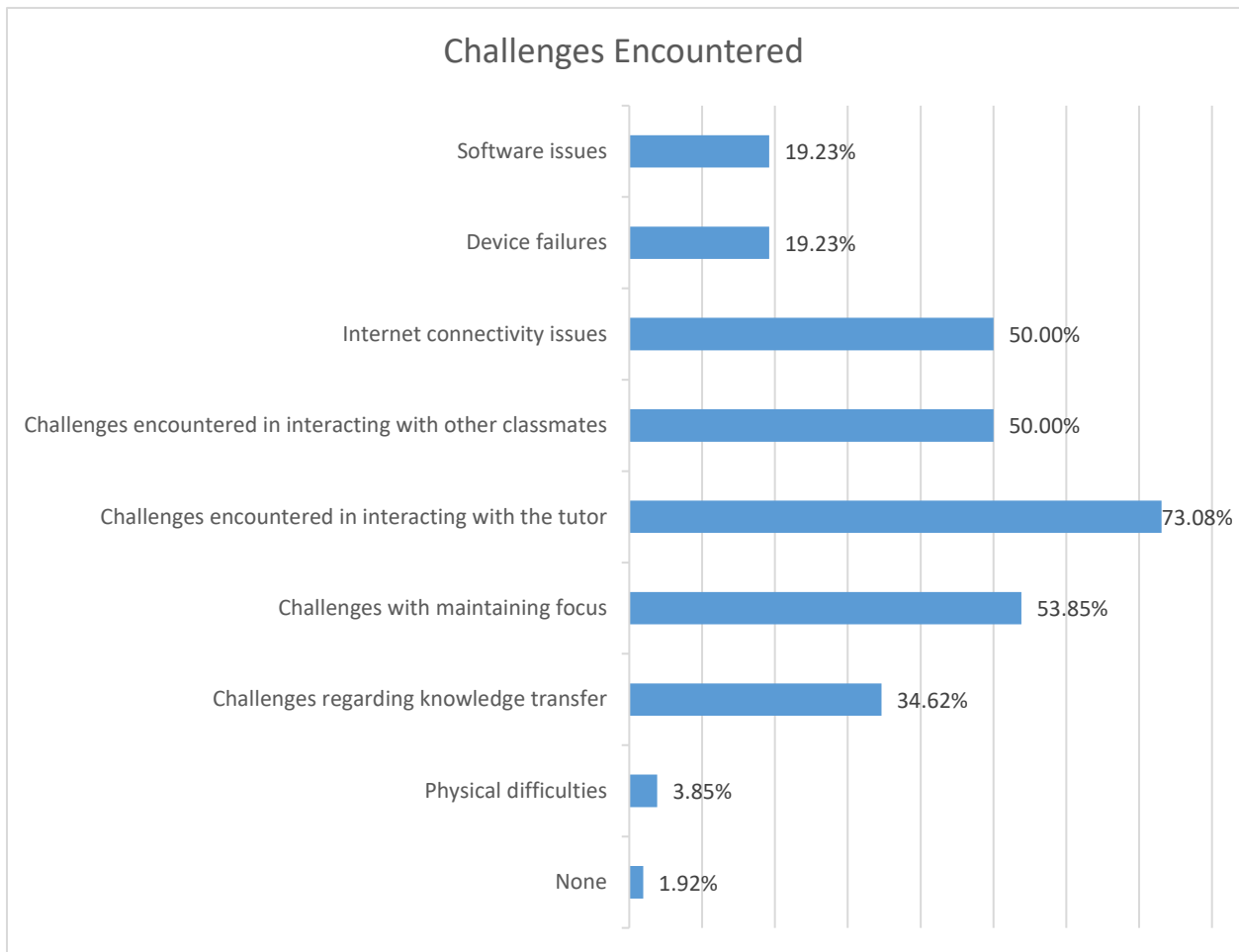
As shown in Figure 7, out of 52 students, the majority, 41 students, indicated that they owned a device before enrolling in a HyFlex course. For those who did not own a device, they purchased one before joining a programme. Additionally, one student used a device provided by their employer for HyFlex learning.

Challenges Encountered while Learning in HyFlex

Figure 8 demonstrates the challenges encountered by learners while using the HyFlex model for learning.

Figure 8

Challenges Encountered by Learners



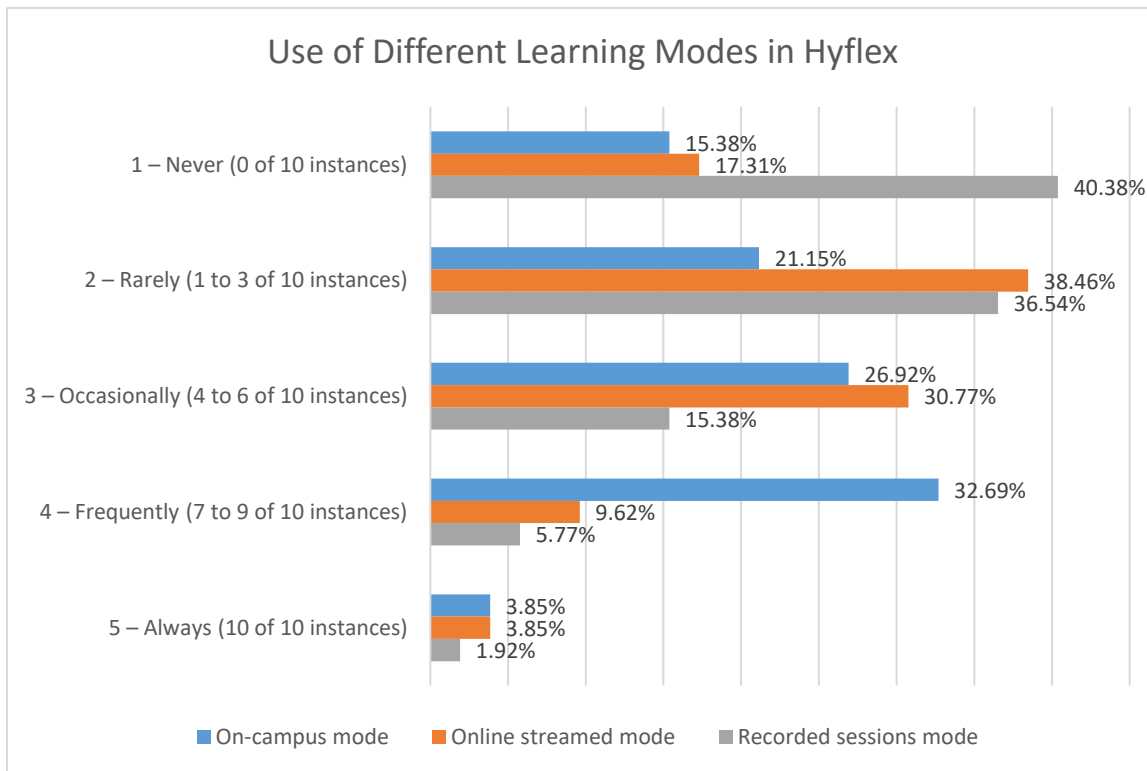
As illustrated in Figure 8, most learners, 73.08%, stated that they faced difficulties when interacting with their tutors. Similarly, 53.85% of respondents reported challenges in maintaining focus. Additionally, an equal percentage, 50%, indicated issues with internet connectivity barriers and challenges in interacting with peers in the context of HyFlex learning. However, 1.92% of the 52 respondents did not select any of the issues listed.

Use of Different Learning Modes in HyFlex

The frequency of using different learning modes in HyFlex model is illustrated in Figure 9.

Figure 9

Frequency of Using Different Learning Modes in HyFlex



According to Figure 9, 40.38% of learners never used recorded sessions. Furthermore, 15.38% of learners never attended physical classroom sessions, and 17.31% of learners never attended online learning sessions. There is a significant increase in the usage of on-campus sessions, from 21.15% rarely to 32.69% frequently. However, there is an opposite trend in the other two learning modes: the usage of online streamed sessions decreased from 38.46% rarely to 9.62% frequently, and recorded sessions decreased from 36.54% rarely to 5.77% frequently, respectively. Additionally, a small percentage of learners adhere to a specific learning mode in the HyFlex model.

Out of 52 total respondents, there were 8 students who never used the on-campus learning mode, therefore 44 responses were considered when calculating the percentages. Similarly, 43 responses were retrieved for online streamed sessions, and 41 responses for recorded sessions.

Experience of Interacting with Classmates

Figure 10 shows the experience of interacting with peers across different learning modes during the learning process.

Figure 10

Experience of Interacting with Classmates

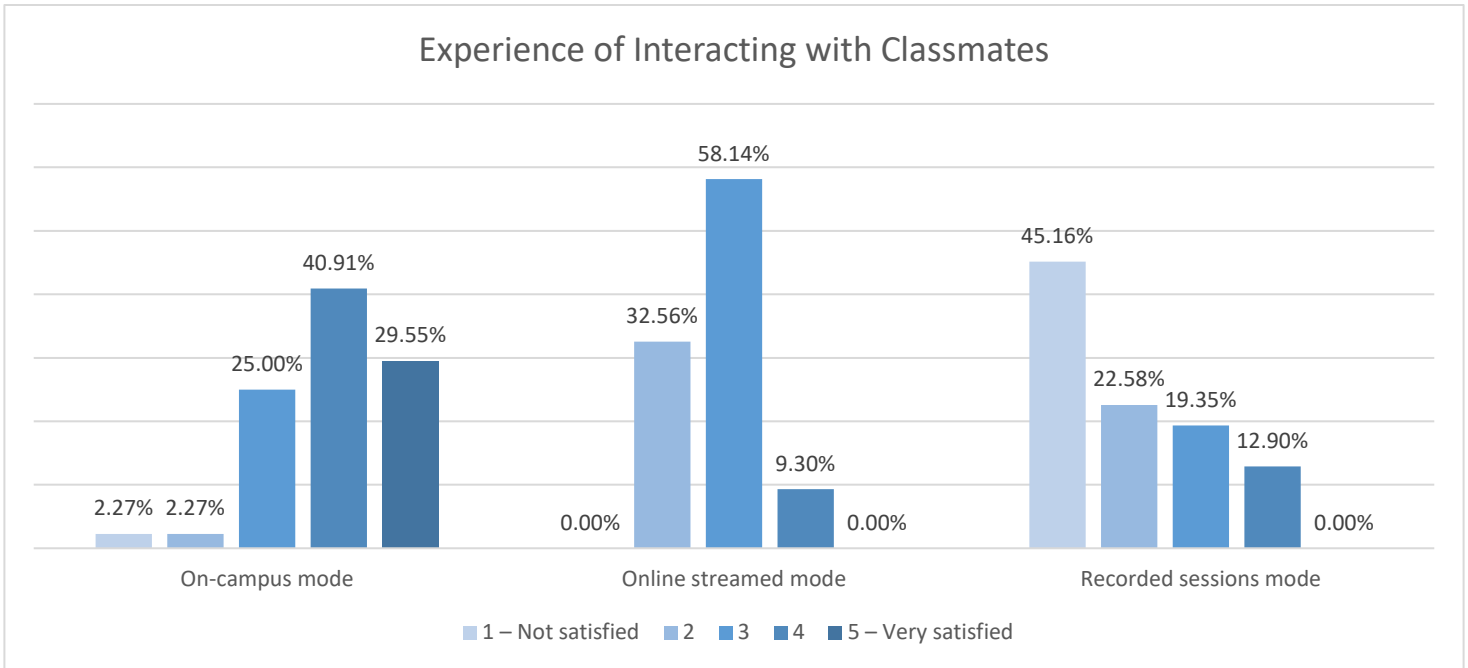


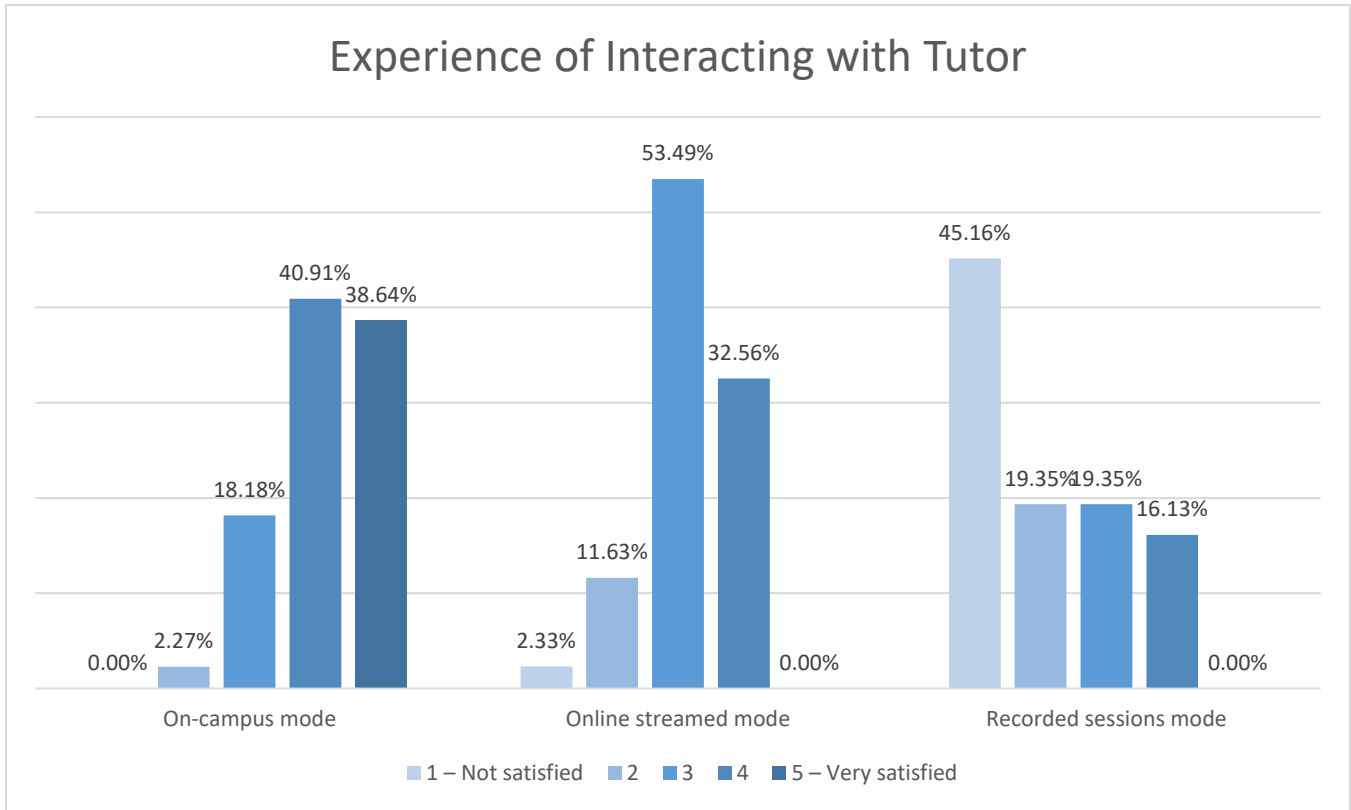
Figure 10 illustrates that collectively, 70.46% of learners are satisfied with their ability to interact with peers in on-campus learning. In synchronous learning mode, the majority of learners (58.14%) are neither dissatisfied nor satisfied with the interaction options available. However, in online streamed mode, 32.56% are dissatisfied with the interaction mechanism with their classmates. For recorded sessions, 67.74% of students are dissatisfied with their ability to interact with peers. Furthermore, 19.35% are neither dissatisfied nor satisfied, and only 12.90% of learners accept the interaction capabilities in asynchronous learning mode.

Experience of Interacting with Tutor

Figure 11 illustrates the experience of interacting with the tutor across different learning modes during the learning process.

Figure 11

Experience of Interacting with Tutor



As shown in Figure 11, the majority (79.55%) are comfortable with their interaction with tutors in the on-campus mode. Additionally, 18.18% of students are neutral regarding their interaction abilities with faculty in the physical classroom. However, satisfaction decreases noticeably from synchronous learning mode to asynchronous learning mode, dropping from 32.56% to 16.13% for student-teacher interaction in these modes within HyFlex. In online streamed mode, 53.49% of respondents are neither dissatisfied nor satisfied with the interaction between learners and educators. Recorded sessions, on the other hand, show a significant level of dissatisfaction with interaction opportunities with tutors, with an overall percentage of 64.51% confirming this dissatisfaction based on the figures.

Experience of Maintaining Focus

Figure 12 demonstrates the experience of maintaining focus while learning across different learning modes.

Figure 12

Experience of Maintaining Focus

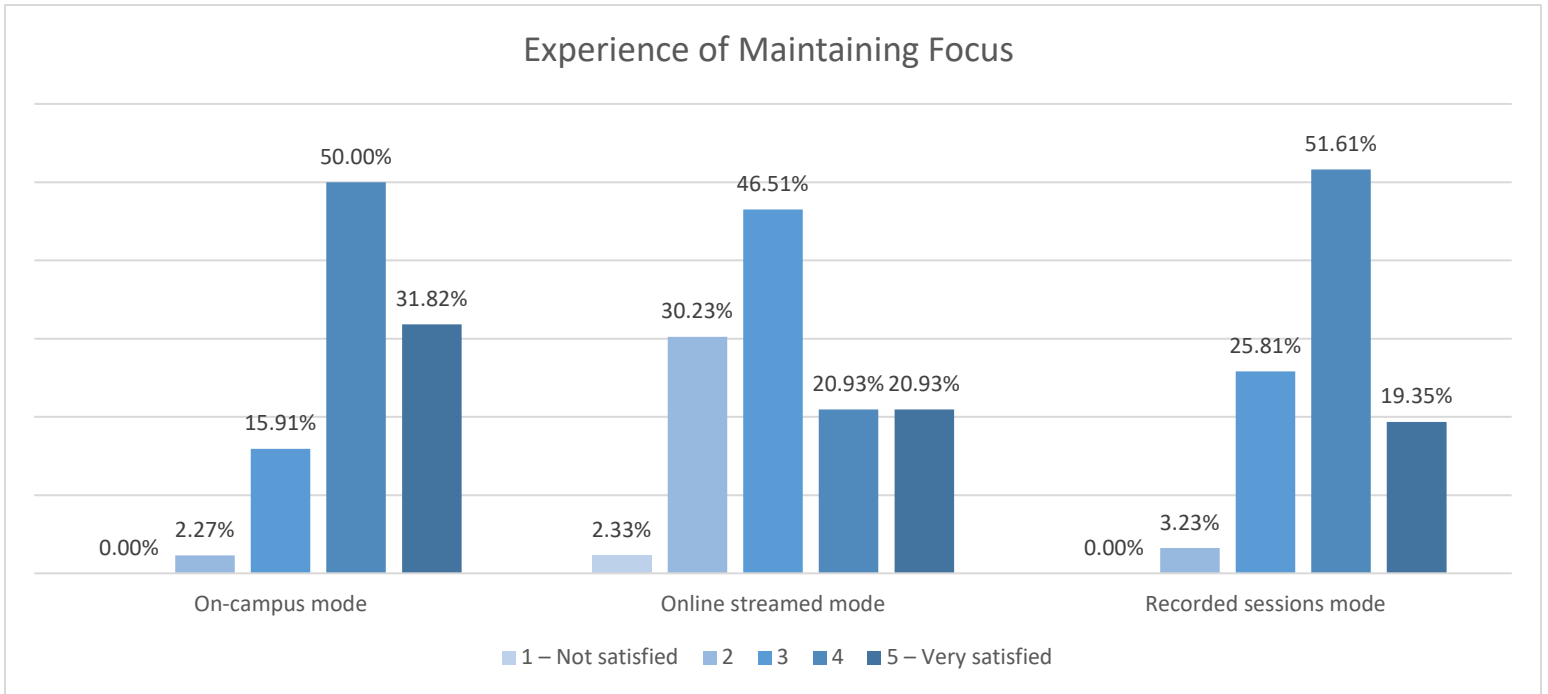


Figure 12 illustrates that both in-class sessions (81.82%) and recorded sessions (70.96%) enable students to maintain higher attention compared to online learning sessions (41.86%), as confirmed by the percentages. However, 32.56% of students expressed concerns about maintaining focus during synchronous learning sessions, with a majority of 46.51% indicating they are neither dissatisfied nor satisfied with that learning mode.

Experience of Knowledge Transfer

Figure 13 illustrates the experience of knowledge transfer during learning sessions in HyFlex learning modes.

Figure 13
Experience of Knowledge Transfer

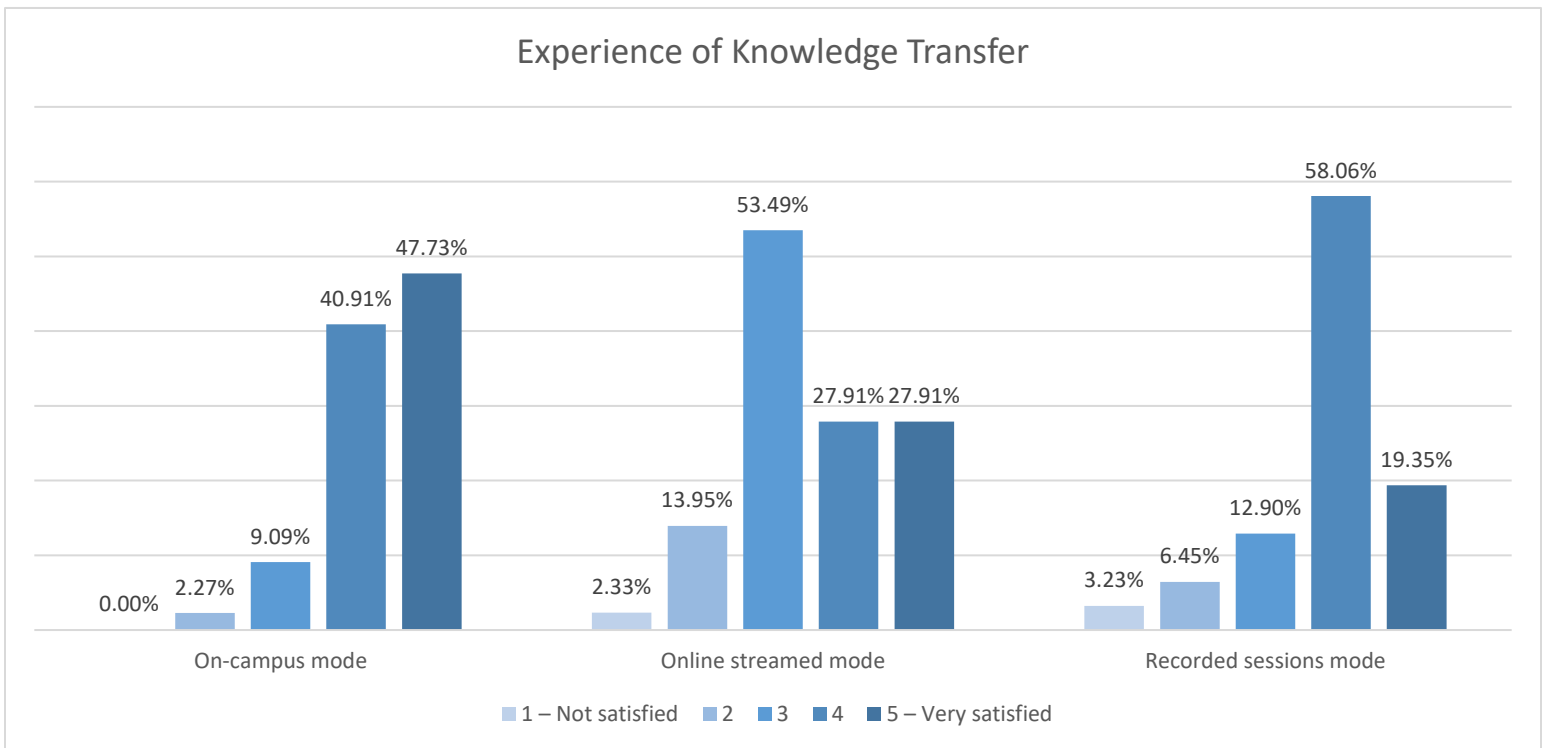


Figure 13 illustrates that collectively, 88.64% of students are comfortable with the knowledge transfer capability during in-person learning, indicating that most students believe they can meet their learning needs in the on-campus learning mode. However, a considerable level of satisfaction is also shown in the other two learning modes. This was confirmed by an overall satisfaction rate of 55.82% in online streamed mode and 77.41% in recorded sessions mode. Additionally, 2.33% were completely dissatisfied with the knowledge transfer opportunities in online sessions, and 3.23% in recorded sessions.

Frequency of Encountering Physical and Mental Stress

Figure 14 helps to understand the frequency of physical and mental stress encountered during various learning modes for students.

Figure 14
Frequency of Encountering Physical and Mental Stress

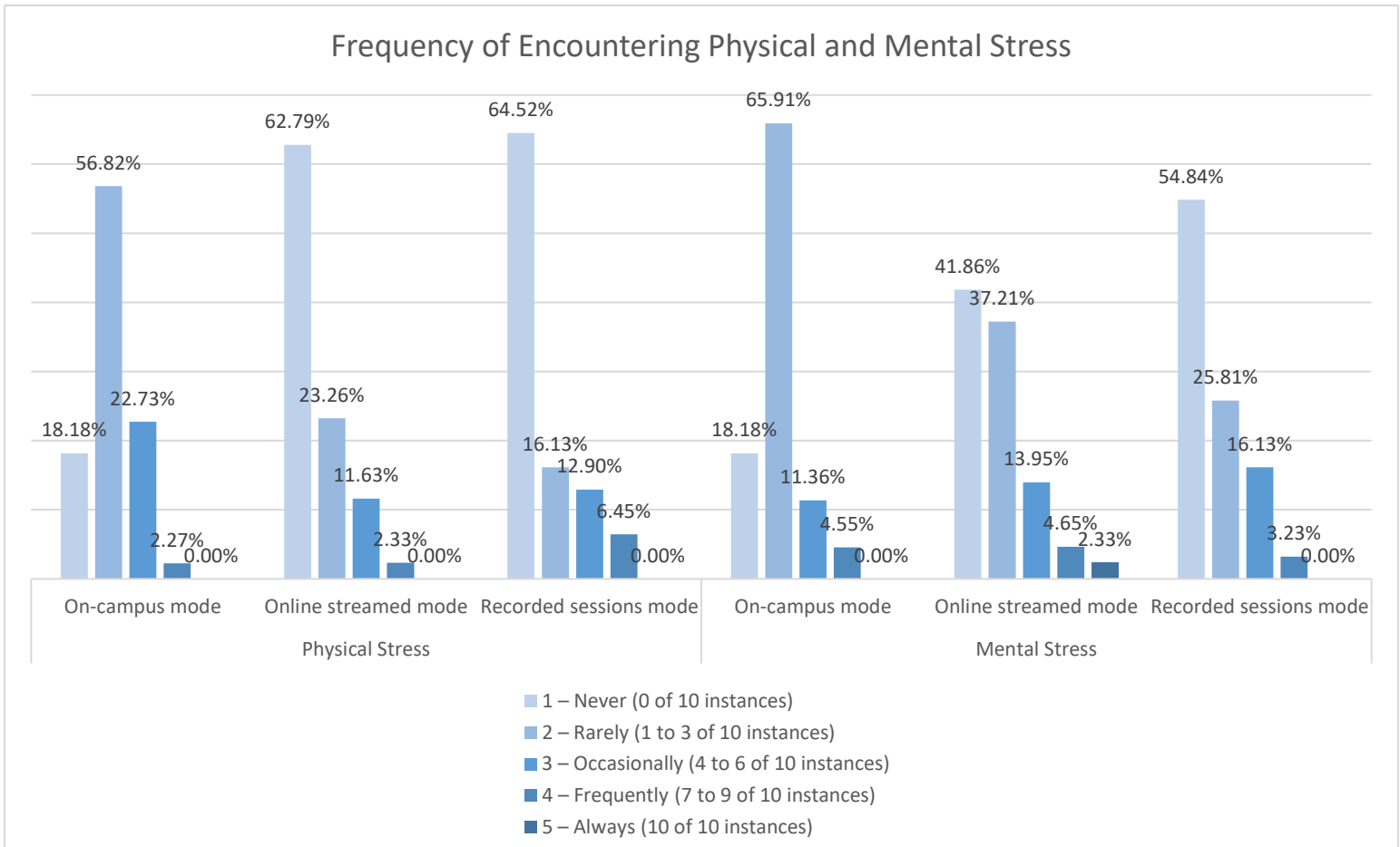


Figure 14 illustrates that in all three learning modes, a high percentage of students never or rarely experience physical or mental stress. Specifically, over 60% of students reported never experiencing any physical stress outside of classroom sessions. The frequency of occasional mental stress ranges from 11.36% to 16.13%, indicating minimal variation in occurrences. A similar pattern is observed for frequent mental stress. Nevertheless, 2.33% of students experience constant mental stress during their online learning sessions.

Overall Satisfaction

Figure 15 shows the overall satisfaction with different learning modes in HyFlex.

Figure 15

Overall Satisfaction

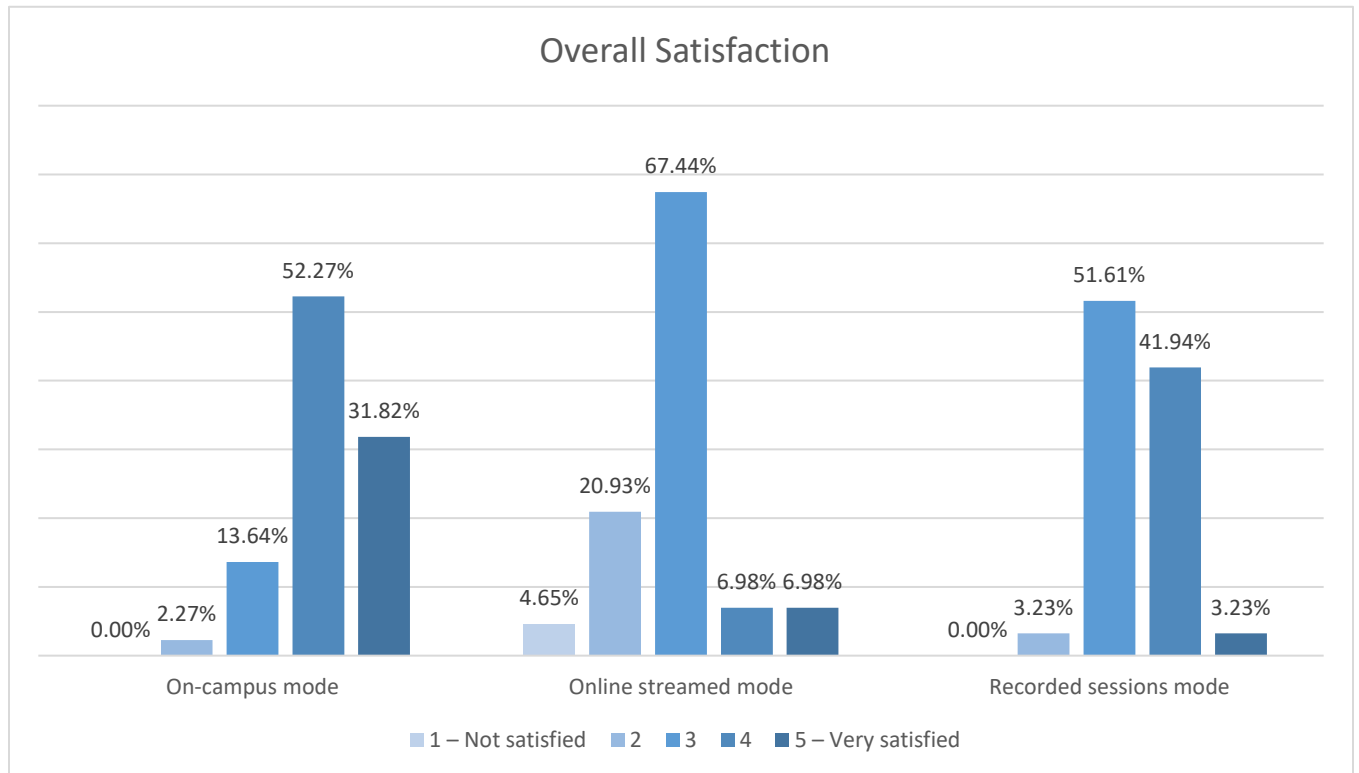


Figure 15 illustrates that the majority of learners are neutral regarding their overall satisfaction with synchronous (67.44%) and asynchronous (51.61%) learning modes. However, 31.82% of respondents were very satisfied overall with the on-campus sessions, while 4.65% of learners expressed complete dissatisfaction with online streamed sessions. In comparison to the other two modes, online sessions showed a lower overall satisfaction rate (13.96%) among learners.

Reasons for Selecting Online or Recorded Sessions

Figure 16 shows the reason(s) behind selecting convenient learning mode(s) other than traditional on-campus mode.

Figure 16

Reasons for Selecting Online or Recorded Sessions

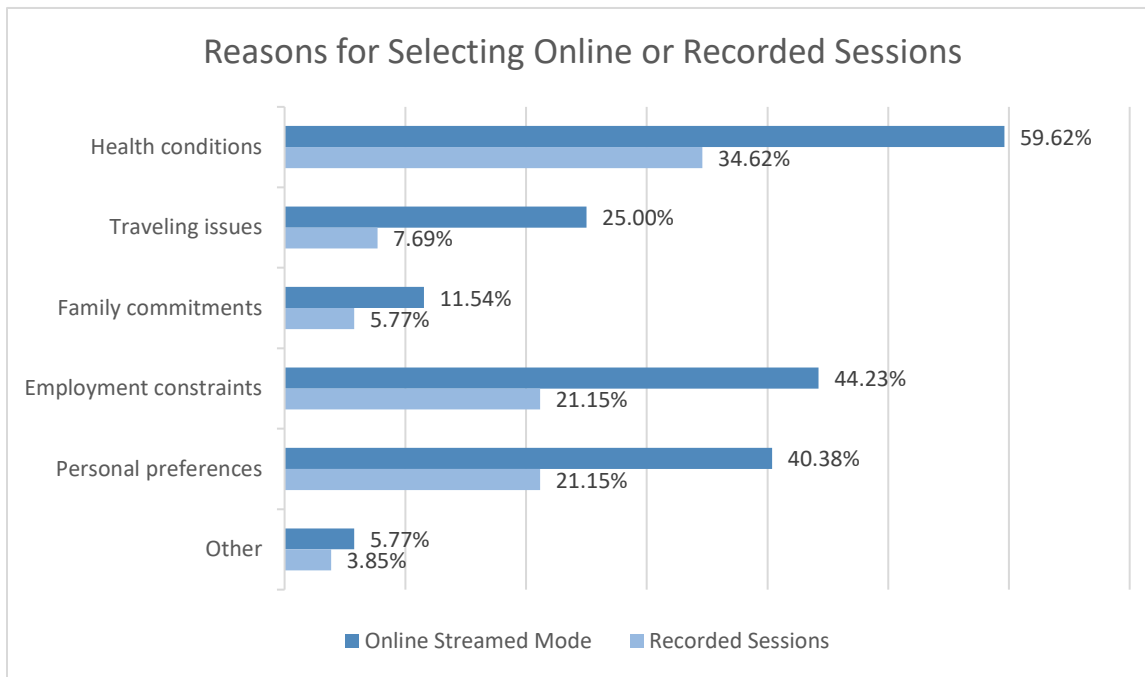


Figure 16 confirms that students are more inclined to choose online streamed sessions over recorded sessions as an alternative study mode to on-campus learning. In both modes, health conditions emerge as the primary reason for respondents selecting either synchronous learning (59.62%) or asynchronous learning (34.62%). Employment constraints also play a significant role in influencing students' choice of these learning modes. Additionally, personal preferences and travel issues are some other considerable factors in these selections.

Student Satisfaction on Assessments in HyFlex Modes

Student satisfaction related to assessments, specifically in online streamed sessions and recorded sessions, will be compared in the following section (see Table 3).

Table 3

Student Satisfaction on Assessments

	Controlled/monitored Assessments		Uncontrolled/non-monitored Assessments		Practical/lab Assessments	
	On-campus Mode	Online Streamed Mode	On-campus Mode	Online Streamed Mode	On-campus Mode	Online Streamed Mode
0 – Not Applicable	11.54%	61.54%	11.54%	9.62%	23.08%	30.77%
1 – Not Satisfied	1.92%	9.62%	1.92%	1.92%	0.00%	3.85%
2	1.92%	11.54%	5.77%	7.69%	7.69%	11.54%
3	19.23%	7.69%	7.69%	25.00%	5.77%	13.46%
4	30.77%	9.62%	40.38%	34.62%	34.62%	36.54%
5 – Very Satisfied	34.62%	0.00%	32.69%	21.15%	28.85%	3.85%

As shown in Table 3, controlled/monitored assessments in on-campus mode demonstrate higher satisfaction, notably with 34.62% of respondents marking themselves as very satisfied. In contrast, online streamed mode shows a notable dissatisfaction rate of 9.62% among students. Furthermore, a majority of respondents (61.54%) in online streamed mode indicated that controlled/monitored assessments were not applicable, highlighting challenges in remote assessment implementation. For uncontrolled/non-monitored assessments, satisfaction tends to be higher in on-campus mode across all rating categories. Practical/lab assessments similarly

reveal higher satisfaction rates in on-campus mode, with 28.85% of respondents indicating very satisfied responses. Overall, these findings highlight differences in satisfaction between on-campus and online streamed modes across various assessment types.

HyFlex Model Challenges and Opportunities for Improvements

The aim of the two open-ended questions was to identify students' perceptions of HyFlex, specifically to gather the challenges they faced and explore opportunities for improving HyFlex based on their experiences. The following are key insights derived from the participants' responses.

It has been identified that communication barriers are a significant concern among several online participants. The available communication options are either not sophisticated or limited. That affects the timeliness and effectiveness of faculty-student and student-student interactions, as well as the exchange of messages. One respondent suggested, "*Appoint a facilitator to handle online queries and manage communications during class*" (QP28), which could enrich productive communication during synchronous learning sessions. Similarly, another major concern of the HyFlex model is maintaining engagement between tutors and online learners, which can lead to insufficient interaction between the online and offline spaces. This issue was highlighted by the following response: "*We do not feel that online participants are included as members of the lesson*" (QP52).

Based on the responses, it was evident that awareness of the HyFlex model is relatively low. As a result, both students and faculty members encounter difficulties in utilising the HyFlex model effectively. The primary reason for this is inadequate training provided to these key stakeholders. One student specifically noted, "*Students and tutors have to be more trained*" (QP51), emphasising the need for enhanced training to improve understanding and implementation of the HyFlex approach. Furthermore, for online attendees, technical difficulties can disrupt their learning experience. Factors such as poor audio and video quality create a negative atmosphere for synchronous learners. In some cases, these issues may develop from tutors' lack of technical literacy. Surprisingly, it was reported that on-campus students were disturbed on several occasions by unintended sound or noise from online participants.

Students have varying perceptions regarding the HyFlex model. Some respondents argued that having full-length lecture recordings could help them cover lessons effectively. One respondent mentioned that sharing textbooks electronically would assist them in accessing course materials. Regarding student evaluation, one respondent stated that HyFlex allows them to complete assessments online rather than through physical examinations, thus enabling them to earn qualifications remotely due to the flexibility of the HyFlex model.

5.2.2. Method 2: Interviews

Semi-structured interviews were conducted with 8 experienced faculty members who have engaged with various delivery methods within the HyFlex model. Each interview consisted of 10 standard questions, supplemented by additional questions constructed based on prior responses. **Appendix D** provides further details regarding the interview questions. On average, the interviews lasted 37 minutes and 27 seconds. Qualitative data from these interviews will be analysed using a thematic approach, aligning with the research objectives. To maintain anonymity, participants will be labelled rather than identified at any stage of the analysis. The key findings derived from the interview responses are presented in the following sections.

UX in Collaboration

Several faculty members shared useful techniques and tools they use to maintain collaboration between learners and educators. These include discussion boards, whiteboards, and chat features available on MS Teams, as well as email, which facilitate interaction between them. It was revealed that working with unknown colleagues on a synchronous platform is challenging.

“It can be more challenging to expect them to be part of a group or to do some group work with people that they don't actually see on a daily basis like other on campus” (IP5)

“A synchronous learner and having to get together with other people that I didn't know that was really hard work” (IP6)

Additionally, some participants mentioned the effectiveness of icebreaker sessions at the beginning of delivery and group activities that involve both on-campus and online students.

These strategies enable learners to blend with their peers, promoting collaborative learning experiences.

UX in Evaluation

For evaluating both on-campus and online students, the majority of participants prefer using assignments. Additionally, quizzes, presentations, and group work are also popular choices. Some faculty members have experimented with teaming up students from both learning modes during presentations and group work to promote interactivity. Students in physical classrooms and online often receive immediate feedback for activities. Asynchronous learners and synchronous learners who prefer personalised feedback typically receive it through email or other communication channels such as meetings on Teams. It has been observed that the analytics tool available on Blackboard (BB) is highly effective for assessing learner engagement with course content.

“I give feedback on spot and then I’m taking some of the students as well. So even the student is from the HyFlex” (IP1)

“Different tools that we use for one is like Blackboard, it provides the analytics as well” (IP2)

Student Focus in Learning

Most participants argued that identifying student focus is easier for in-class students compared to online students, where monitoring their focus led to significant challenges.

“Students in the classroom, you can just observe. For an online student, you can’t really do that” (IP3)

One participant highlighted that young learners in synchronous mode often become easily distracted. Additionally, faculty members cannot compel students to remain engaged with the session.

“Young students attending remotely can easily get distracted and we can’t force them to engage” (IP7)

Specifically, because online participants have the option to turn off their cameras, it is challenging to assess their engagement with the session. Faculty members face questions about how to retain the attention of online learners, who may not respond verbally or may occasionally send unrelated messages via chat to indicate their presence during the session.

UX in Knowledge Transfer

Knowledge transfer in synchronous mode is almost identical to that in on-campus settings, as participants in synchronous sessions do not miss out on any content.

“So, the ones that online at the same time, they’re not missing anything unless there’s a bit of collaboration” (IP2)

However, asynchronous learners having access of more condensed and summarised versions of session recordings, though they may miss out on important discussions that occur during live sessions. The HyFlex model enables digital access to the learning contents, allowing learners in any mode to access materials as needed.

One faculty member revealed that participants in live sessions tend to perceive information availability as an advantage but may not actively engage with it. However, the same faculty member found that asynchronous learners performed better in this regard, which increased confidence in the suitability of the HyFlex platform.

“The students that were asynchronous did a better job of the assessment than the students that were in class. And I think it’s because the asynchronous learner has to go through all of that information. I feel quite confident that the information and that platform is very good for the asynchronous learner.” (IP6)

Challenges for Faculty Members

For faculty members, delivering through the HyFlex model presents several challenges, caused by technological complications, class sizes, lack of technical knowledge and experience, and content development concerns. Technological challenges include connectivity issues, slow Internet speeds (from the students’ end), device malfunctions or poor quality, infrastructure

failures such as power outages, and improperly set up HyFlex classrooms. These issues are commonly reported among faculty members.

“Sometimes from the student side due to like low Internet speed and so on especially those students who are living in a farm, it can be difficult for them to join it in a synchronous way” (IP2)

Several faculty members also noted that the number of students in each learning mode can create difficulties in maintaining interactions and effectively executing courses. They have observed instances where chat messages go unanswered until breaks, and synchronous learners requiring assistance during practical components faced challenges. This may be attributed to the lack of technical knowledge among faculty members, making it challenging for them to oversee all aspects comprehensively.

“If you’ve got fifty students, it’s a lot more difficult to know when a student is struggling, and it’s even more difficult if they’re struggling by themselves sitting at home on HyFlex” (IP3)

Additionally, the considerable time required to create appropriate course content and the extra workload involved in content preparation are significant concerns. Furthermore, most faculty members have observed that students are less likely to watch full-length lecture recordings. Collectively, these challenges can create barriers to the smooth implementation of HyFlex delivery.

“Even though it’s only a 10-minute video, it’s probably an hour of work to think about what you’re going to put in how you’re going to structure” (IP4)

Issues of Learners from Faculty Members Viewpoint

One faculty member revealed that students may struggle with the HyFlex model depending on the experience level of the faculty member delivering the specific course. Another participant mentioned that some learners tend to use their mobile phones to join online learning sessions, which can make it difficult for them to access and navigate content easily. The maturity level of students influences their ability to manage learning and time effectively, potentially leading to poorer performance in the HyFlex model. Additionally, one faculty member observed

that asynchronous learners may not consistently check BB contents, which can also impact student performance similarly.

“Students probably have struggled a bit with different tutor’s level of HyFlexing” (IP4)

“It can be a disadvantage if students haven’t got a laptop or something that to be able to, just there’s readings, there’s videos to watch. Sometimes as the PowerPoints stuff you’re working on that size screen, it’s not ideal” (IP5)

“So, they’re not very mature and their mind-set about how to manage their time” (IP6)

User Satisfaction

“In my point of view, education is available for any student at their convenient time schedule. HyFlex is a remarkable thing for the students who are not have the opportunity to visit for the class” (IP1)

“We had a student last year who had done 90% of her degree, had moved to Christchurch. She only had one or two papers, so she opted to HyFlex that” (IP4)

“I’ve had some HyFlex students that are absolutely top of the class. Their intention is incredible. Their output is incredible” (IP8)

Participants hold a positive view of HyFlex due to the countless opportunities it offers both faculty members and learners, ensuring equal educational experiences that facilitate lifelong learning through various modes. That is further reinforced by the robust support offered by the HyFlex support team.

“We’ve had amazing support from the HyFlex team” (IP6)

Additionally, HyFlex ensures flexibility in learning and access to materials as needed. The system enables the creation of concise yet powerful materials, enhanced through reflections on past experiences and adjustments to industry changes. That ensures the content remains up-to-date and reusable. The HyFlex setup supports infrastructure that enables faculty members to adapt their teaching methods, ensuring an optimal learning experience for students. However,

despite these advantages, the majority of participants express a preference for on-campus learning due to its opportunities for interaction, collaboration, and communication.

“We generally find most students actually prefer to come in person on site because they I guess they enjoy the social elements of being among classmates” (IP7)

“I do a feedback session especially with that audit class, they prefer to be in class” (IP4)

Faculty members emphasised the importance and effectiveness of face-to-face sessions, highlighting the immediate feedback and the ability to adjust teaching strategies based on student reactions. That significantly enhances educational quality through human interactions.

“The choice, is always there, but we know as tutors that the human interaction is really what makes the difference” (IP8)

For all learners, the primary influence of the HyFlex model lies in its flexible learning options, which cater to their work/family commitments, travel constraints, health considerations, and mental well-being. Specifically, young learners are particularly drawn to HyFlex due to their familiarity and comfort with technology and screens.

Suggested Improvements and Possible Expansions

Faculty members have suggested improvements to both their own practices and the HyFlex model to better meet user needs. One significant improvement they proposed is enhancing their technological and technical literacy, which can positively influence content quality and session delivery effectiveness while reducing issues.

“The tutor, first of all, they need to be well equipped with the technology” (IP1)

“As tutors, we just have to get into the habit of multitasking and building situational awareness” (IP7)

This upskilling would enable faculty members to troubleshoot independently during sessions. One participant highlighted the potential of Artificial Intelligence (AI) to enhance delivery by precisely identifying diverse learner needs.

“I have seen the use of AI in a HyFlex model by Khan Academy. Where it provides individual guidance and the instruction as well as activities for the learners” (IP2)

Additionally, effective management of class sizes was noted to significantly impact teaching and learning quality.

“I think probably that the numbers of students in classrooms in, in classes needs to be capped” (IP3)

Moreover, faculty members noted that theory-driven programmes or papers are easily adapted using the HyFlex model with minimal effort compared to practical subjects, where implementation might be more challenging.

“It’s easy for theoretical subjects” (IP7)

“It’s definitely challenging for some subjects, like the accountants definitely find it a lot harder. They’re doing a lot more activities” (IP6)

“It’s good for both these students as well as for the tutor and management for all, all the party. I think it’s a win-win situation” (IP2)

They suggested that offering courses via HyFlex could benefit both users and the management of SIT. Overall, they expressed optimism about the future growth of HyFlex based on their current satisfaction levels. However, one faculty member mentioned the challenges of conducting invigilated examinations in an online mode as a barrier to broader adoption.

5.3. Discussion

This study serves as the foundation for exploring the user experience and satisfaction with the HyFlex model among its users. To achieve this, the study planned to gather meaningful insights from students and faculty members through a questionnaire and interviews, respectively, aiming to collect both qualitative and quantitative data. Section 5.2 presented the results derived from the collected data, which will be analysed to examine their relationship with existing conclusions from similar studies and to explore contrasting ideas. The findings will be categorised based on the research objectives and discussed in the subsequent sections.

Factors Affecting User Experience

Based on the current study, technological factors, ease of collaboration between student-faculty and student-student, evaluation methods, efficiency of knowledge transfer, ability to maintain focus, and knowledge and experience with HyFlex were identified as the main factors influencing user experience with the HyFlex model at SIT Invercargill campus.

Both students and faculty members confirmed that connectivity issues and device malfunctions can negatively impact their experience with HyFlex, supported by Alkubaisi et al. (2022) and Almaiah et al. (2020). Questionnaire participants expressed a significant preference for on-campus student-student interactions at 70.46% and student-faculty interactions at 79.55%, compared to the other two learning modes in HyFlex. Additionally, all faculty members interviewed also emphasised this learning mode as ensuring the highest level of collaboration. A study by Detyna et al. (2023) similarly highlighted that face-to-face sessions provide more collaboration opportunities compared to online formats. However, the majority of faculty members highlighted the importance of maintaining interaction on HyFlex using tools such as whiteboard and discussion boards. Almaiah and Alismaiel (2019) also stressed this idea, stating that discussion boards and chats are crucial collaboration tools in online courses. When considering student evaluations, most faculty members preferred to use uncontrolled assessments such as assignments, presentations, and quizzes. However, they expressed uncertainty about the most appropriate method for conducting invigilated examinations in online mode within the HyFlex model. Students also reported being mostly satisfied with uncontrolled assessments like assignments but indicated they were unfamiliar with controlled assessments. Interview respondents confirmed that both physical and online students experience the same level of knowledge transfer, whereas asynchronous learners may miss valuable aspects of the sessions. However, students demonstrated a stronger preference for on-campus sessions (88.64%) and recorded sessions (77.41%) compared to online sessions in terms of knowledge transfer. The popularity of concise videos created by faculty members may contribute to these preferences. Similarly, Lakhali et al. (2021) also found that instructors' strategies of creating short videos on course contents can significantly enhance knowledge transfer. Students have confirmed that the on-campus mode is the most effective method for maintaining their focus during sessions. This observation was further supported by faculty members during their interviews. They mentioned

that asking questions helps in maintaining the focus of online learners, although distractions remain a concern. According to a study, it was revealed that students must practice self-regulation to achieve successful learning in the HyFlex model (Kohnke & Moorhouse, 2021). Data collected using both methods clearly indicate that the knowledge and experience of students and faculty members with the HyFlex model significantly influence their user experience. The findings adhere to the principles of CoI, which emphasise the importance of cognitive presence, social presence, and teaching presence, significantly impacting the educational experience of students.

Challenges Faced by Students

The questionnaire data highlighted several challenges, including technological difficulties, a lack of knowledge about the technology and the HyFlex model, communication barriers, and limited opportunities for student engagement and interaction. Technological difficulties encompassed issues such as sound and video problems, connection failures, and disturbances. Multiple studies have emphasised the impact of similar technological difficulties, which pose challenges to seamless access and the overall educational experience using the HyFlex model (Detyna & Koch, 2023; Kohnke & Moorhouse, 2021; Ohanu & Chukwuone, 2018). These findings align with the guidelines of the SAMR model, which highlights the relationship between technology integration and education. The research findings related to engagement and interaction barriers were supported by another study conducted by Athens (2023), which observed that their participants felt disconnected from their colleagues and were separated due to different learning modes. However, Raes (2022) and Heilporn and Lakhali (2021) presents a contradictory viewpoint, stating that there is no significant difference in student engagement and interaction with their peers and tutors between the traditional learning model and the HyFlex learning model. From the faculty member interview responses, it was revealed that the experience level of faculty members with the HyFlex model may introduce challenges for learners in achieving their expected outcomes. Additionally, faculty members also mentioned that challenges such as working with unknown peers for the first time across different learning modes, accessing learning materials on small screens, and varying maturity levels among learners can impede students in achieving their educational goals using the HyFlex model.

Challenges Faced by Faculty Member

Insights from faculty member interviews highlight challenges such as technological barriers, lack of technical skills and experience, distribution of student numbers across individual learning modes within a class, workload associated with content preparation, effort required for group work, and conducting invigilated examinations in the HyFlex model are significant concerns they face.

Based on the interview data, it was found that technological obstacles for faculty members include, but are not limited to, connectivity issues due to device and power failures, malfunctions when playing AV content, limited fully equipped classroom setups targeting large student numbers and potential expansion of courses offered through HyFlex delivery, and connectivity issues caused by students' low bandwidth from their end. Similarly, Almaiah et al. (2020) identified concerns indicating that technological factors are crucial for the successful implementation of an online learning model. Faculty members also expressed that their knowledge and understanding of technical setup and operations can limit the success of HyFlex delivery. For example, they encounter difficulties when switching between cameras. Additionally, their experience may disrupt meeting the functional needs of learners. For instance, faculty might fail to respond promptly to chat messages if they are unaware of received messages on MS Teams, potentially leading to missed help request messages. According to Detyna and Koch (2023), student participants asserted that the overall success of the HyFlex model depends on competent staff members. They emphasised the importance of providing adequate training for staff before offering a course through HyFlex to ensure their technical literacy and self-troubleshooting abilities. This study found that difficulty in interacting with synchronous learners, especially as class size increases, can pose hurdles for HyFlex delivery. It can also affect the formulation and conduct of group activities. Some faculty members expressed discomfort with large classes, which further complicates the process of conducting invigilated examinations for online students. Athens (2023) found that conducting group work becomes challenging when one group of students is in the physical classroom while another group joins for the online session. This idea aligns closely with the findings of the current study. The research findings indicated that content development overhead can present a challenge for faculty members in the HyFlex model. They revealed that preparing even a short video can be

time-consuming, and the process introduces significant additional workload, which can lead to stress among faculty members. The results by Dumford and Miller (2018) supported a similar idea in their research.

User Satisfaction on HyFlex

According to the questionnaire responses, student participants provided insights into overall user satisfaction rates across different delivery modes in HyFlex. Among the three modes, the highest student satisfaction was documented for the on-campus mode (84.09%). For synchronous (67.44%) and asynchronous (51.61%) modes, most students indicated a neutral satisfaction level. This suggests that while most students are satisfied with in-class sessions, they find online and recorded sessions to offer flexible learning opportunities, despite with less collaboration. Faculty members also expressed a preference for the on-campus mode as their preferred delivery method, noting that students are happier with in-class learning. Interview findings also support that conclusion. Student responses indicated that health conditions, employment constraints, personal preferences, and travel issues are primary reasons for selecting online or recorded sessions as their preferred learning mode. The interviews also highlighted similar concerns, showing that students often choose these modes due to travel, work, illness, and family-related reasons. This kind of flexibility is also supported by the UDL framework, which encompasses equal learning opportunities and flexibility for students. Multiple studies have confirmed that factors such as flexibility and personal circumstances influence students to opt for alternative learning modes over traditional on-campus learning (Detyna & Koch, 2023; Kohnke & Moorhouse, 2021; N. J. Mentzer et al., 2023). However, a contrasting idea is presented by Athens (2023), who stated that 78% of student participants were extremely satisfied with the flexible learning modes offered by the HyFlex model.

Improvements Suggested by Participants

To enhance the user experience and satisfaction by minimising the challenges faced by HyFlex model users, questionnaire and interviews gathered suggestions from students and faculty members. Here are some of the improvements suggested by participants:

- Equipping faculty members with necessary tools and technologies.

- Utilising AI to accommodate the diverse needs of learners.
- Implementing caps or regulations on student numbers in each delivery mode.
- Promoting multitasking and situational awareness among faculty members.
- Establishing appropriate guidelines and best practices.
- Enhancing technologies for better interaction and engagement.
- Focusing on both in-class and online students with improved engagement techniques.
- Providing comprehensive training on the HyFlex model for students and faculty members.

Collective studies also discussed similar improvement options for the HyFlex model and practices aimed at maintaining the expected level of quality across delivery modes, with the goal of enhancing user experience and satisfaction (Abusalim et al., 2020; Almaiah et al., 2020; Kohnke & Moorhouse, 2021).

5.4. Summary

This chapter critically analysed quantitative data retrieved from the questionnaire and qualitative data from interviews and open-ended questions using descriptive statistics and thematic analysis, respectively. It presented information in relation to the objectives outlined in section 1.5. Firstly, it documented insights derived from participant responses. Subsequently, these insights were related to the research objectives and supported by similar or contrasting literature. The study revealed that technological aspects, collaboration facilitation, evaluation methods, efficiency in knowledge transfer, focus retention capabilities, knowledge and experience with the HyFlex model significantly influence user experience. Moreover, the study identified that challenges affecting these factors contribute to varying levels of satisfaction. However, both faculty members and students expressed a preference for traditional on-campus learning and delivery. Despite acknowledging the flexibility of the HyFlex model, difficulties primarily related to collaboration and engagement have shifted users' preferences toward the on-campus mode. To enhance preference for the HyFlex model, these challenges must be addressed.

The next chapter will conclude this study by identifying limitations and recommending future improvements to ensure broader user experience and satisfaction with the HyFlex model among its users.

Chapter 6. Recommendations and Conclusion

6.1. Introduction

This chapter functions as a summary of the research, merging key findings and their connections with other relevant studies, theories, and frameworks related to the study. It validates the research outcomes against the intended aims and objectives. Additionally, this chapter concludes the research by addressing its limitations or shortcomings, offering recommendations for future studies and opportunities to further explore the findings. Furthermore, this chapter establishes the foundation to justify the significance of the research, critically evaluating how effectively the process contributed to achieving the primary goal.

6.2. Purpose of the Research

The purpose of this research is to explore the user experience and satisfaction of students and faculty members at the SIT Invercargill campus regarding the HyFlex model. To achieve this goal, specific objectives were defined to identify factors affecting user experience of the HyFlex model, to explore challenges faced by both students and faculty members, and to determine the satisfaction levels of these primary stakeholders. Chapter one established the foundation for the research by outlining its aims and objectives, providing a solid entry point into the study.

Chapter two provided an in-depth exploration of the education industry's expectations regarding the provision of equal and flexible learning opportunities for learners. It examines associated theories related to different learning modes of the HyFlex model. The chapter's content serves as a basis to justify the significance of the research within the education industry and its practices. Furthermore, the study aligns with requirements and frameworks set by the MoE of NZ, confirming its relevance to the educational landscape. The conducted PESTEL analysis supports this research by identifying factors such as government stability, which ensures funding for TEOs to enhance learning environments. Additionally, factors like steady GDP growth, student number growth during post-COVID-19 and technological advancements contribute to an environment conducive to utilising diverse learning and delivery methods. Moreover, a SWOT analysis underscores the strengths of SIT and opportunities for enhancing

the HyFlex model to meet anticipated satisfaction levels. This includes addressing challenges faced by users and improving their overall experience. Chapter two and its contents effectively illustrate how the study aligns with its intended purpose and fits within the educational context.

Chapter three organised existing literature related to HyFlex education, encompassing its opportunities, challenges, user experiences, and satisfaction levels among HyFlex model users. While direct literature specifically related to this research was limited, a careful analysis of background information and findings from related studies facilitated the categorisation and synthesis of ideas into themes that aligned with the research objectives. To achieve this purpose, the first theme organised factors that influence user experience (UX), focusing on aspects such as technological infrastructure, instructional design, and learner engagement. The second theme addressed challenges introduced by the HyFlex model for its users, including issues related to technological proficiency, pedagogical adaptation, and other challenges. The third theme aimed to investigate factors influencing user satisfaction with the HyFlex model, encompassing technological reliability, pedagogical effectiveness, and flexibility in various learning modes. Through a thorough analysis of the literature, these themes guided the formulation of the methodological approach for conducting this research.

Chapter four explained the methodological approach used in conducting the research. The study began by selecting the most relevant research philosophy, opting for interpretivism, and employing an inductive approach to identify individual viewpoints of HyFlex users and derive general conclusions based on the collected data. A mixed-methods approach was employed, utilising survey techniques through questionnaire and interviews to gather data from students and faculty members, respectively. The data underwent descriptive statistical analysis, including the analysis of closed-ended questionnaire responses and thematic analysis of open-ended questionnaire responses and insights gathered from interviews. The overall purpose of the selected methodologies was to ethically collect the necessary data aligned with research objectives. The descriptive research design approach was employed to identify patterns in the data, aiding in drawing conclusions by generalising ideas provided by stakeholders. The study involved conducting 8 semi-structured interviews with faculty members and receiving 52 student responses to the questionnaire, which proved invaluable to achieving the research objectives.

Chapter five critically analysed and discussed the findings of this research. The sections separately examined data derived from questionnaire responses provided by students using descriptive statistics and insights from interviews with faculty members using thematic analysis. Results showed a higher preference among both students and faculty members towards the on-campus delivery mode. The main reason for this choice was the interaction and collaboration facilities ensured in the on-campus mode. However, students valued the flexibility provided by the synchronous mode when they faced difficulties participating in in-class sessions due to health concerns, employment constraints, travel barriers, and personal preferences. Nevertheless, they expressed concerns about fewer engagement opportunities available with their colleagues and tutors in the synchronous mode. Both participants mentioned improvements that could be introduced to the HyFlex model, such as providing adequate training for users, ensuring situation handling and awareness for faculty members, and regulating the class sizes. Triangulating the results also discovered similar ideas regarding their user experience and satisfaction with the HyFlex model. In summary, many of the research participants preferred the on-campus learning mode as their first choice.

6.3. Relationship to Previous Research

The urgency created by COVID-19 to deliver programmes using alternative modes, rather than the usual on-campus learning, has been authorised by regulatory bodies in the NZ education sector for institutions. The ultimate goal of these policies and guidelines is to provide equal and flexible education opportunities for learners. SIT introduced the HyFlex model in 2021 to offer flexible learning pathways in accordance with industry requirements. The success of the HyFlex model is determined by user satisfaction. Therefore, this research focused on exploring the user experience and satisfaction of HyFlex model users at SIT Invercargill campus. The research was significant in contributing to SIT's efforts to enhance the effectiveness of its educational delivery, thereby benefiting the broader education industry.

Several studies have examined the challenges faced by HyFlex users, revealing negative impacts on user experience and satisfaction (Athens, 2023; Detyna & Koch, 2023; Detyna et al., 2023; Heilporn & Lakhali, 2021; Kohnke & Moorhouse, 2021; N. J. Mentzer et al., 2023; Nweke et al., 2022; Raes, 2022). Connectivity barriers and device failures were identified as significant

issues affecting both students and faculty members (Alkubaisi et al., 2022; Almaiah et al., 2020). The majority of student participants expressed a preference for the on-campus mode due to the ease of maintaining engagement with peers and tutors, this finding is supported by Detyna et al. (2023). In response to these challenges, faculty members have utilised tools such as the whiteboard (available on MS Teams) and discussion boards (available on BB) to foster interaction among learners across different HyFlex modes, consistent with the recommendations of Almaiah and Alismaiel (2019). They emphasised the importance of utilising collaboration tools in online learning environments compared to the natural face-to-face interactions available in physical learning settings. Regarding knowledge transfer, faculty members explained equal capability in both on-campus and online modes. However, students reported equal opportunities for knowledge acquisition in on-campus and recorded session modes within the HyFlex model. They preferred recorded sessions for their concise summaries and key abstracts, which facilitate learning without the need to watch full-length videos, a preference supported by Lakhali et al. (2021) highlighting the effectiveness of condensed videos for knowledge transfer. This study found that faculty members face a relatively high workload due to the need to tailor content for different learning modes. A similar idea was presented by Dumford and Miller (2018). Moreover, this research highlighted the importance of maintaining focus retention to ensure an acceptable level of user experience. Kohnke and Moorhouse (2021) emphasised the role of student responsibility in regulating their engagement to maintain focus during learning.

The results of this study indicate that technological difficulties can disrupt the smooth user experience, affecting interactions, communication, and focus. Similar findings have been reported in multiple studies, highlighting the negative impact of such challenges (Detyna & Koch, 2023; Kohnke & Moorhouse, 2021; Ohanu & Chukwuone, 2018). Athens (2023) implied that students may feel disconnected and isolated across different learning modes, but this perspective is challenged by the findings of Raes (2022) and Heilporn and Lakhali (2021), which indicate no significant issues related to student engagement in HyFlex environments. Nevertheless, this study found that faculty members' knowledge and experience with HyFlex setups positively contribute to overcoming challenges in engaging students. Student participants revealed that their faculty members' experience significantly influences the success of the HyFlex model (Detyna & Koch, 2023).

This research found that the flexibility of learning options and changes based on personal preferences and circumstances often lead students to choose online or recorded sessions in HyFlex model. However, the majority of learners remain neutral regarding user satisfaction due to the challenges they face in maintaining engagement and focus on learning modes other than traditional on-campus mode. Similar ideas have asserted that flexibility is the main reason students choose alternative learning modes over face-to-face sessions (Detyna & Koch, 2023; Kohnke & Moorhouse, 2021; N. J. Mentzer et al., 2023). However, Athens (2023) stated that the majority of her research participants hold a different view, contradicting the general perception by indicating learners are highly satisfied with all the different learning modes in HyFlex.

In conclusion, the findings are consistent with existing literature, though some deviations were observed, particularly in relation to the online learning mode, reflecting the perceptions of users at the SIT Invercargill campus.

6.4. Limitations of the Present Study

The scope of this research is to investigate the user experience and satisfaction of HyFlex users specifically at the SIT Invercargill campus. It is important to note that the study does not encompass all stakeholders of the HyFlex model in NZ context. Therefore, the conclusions drawn are specific to the selected organisation and may not provide a comprehensive view of all aspects of the HyFlex model. As the researcher works part-time as a tutor at SIT, there is a possibility of bias introduced in the interviews, which could potentially impact the findings of the research.

The research methodology employed a combination of a questionnaire and interviews to collect data. However, analysis revealed that participants mostly came from a few available programmes delivered using the HyFlex model. This limitation raises concerns about potentially misinterpreting the actual challenges faced by students and faculty members. Consequently, findings may vary with different sample sizes. Recruiting student participants for the questionnaire posed challenges, as some programmes were nearing the end of their semester with students busy with assessments and examinations. Due to the mandatory requirement by NZ immigration for international students to attend in-person classes, their opportunities to

experience online learning, particularly in programmes such as MAM, are limited. This restriction can tighten the collection of their views regarding the synchronous learning mode. Such constraints were beyond the researchers' control and likely impacted the research results. To enhance the credibility of the findings, the inclusion of observations could have been beneficial. Observing operational difficulties within the HyFlex model by attending sessions where students engage in different learning modes could have provided additional insights.

In summary, while this research provides valuable insights, it is crucial to interpret the findings within the context of the specific study limitations and scope. Future research should consider broader participation across multiple institutions to gain a more comprehensive understanding of the HyFlex model's effectiveness and challenges.

6.5. Recommendations for Future Research and Practice

Based on the discussed limitations in section 6.4, the following recommendations are proposed. The research revealed that the lack of interaction and collaboration between students and between students and faculty members during online sessions, which heavily relies on the technological and technical literacy of educators and learners, contributes to poor engagement. The findings highlighted the importance of maintaining manageable class sizes to support effective online learning engagement. They also emphasised the need for standardised regulations and set training initiatives mandated by educational authorities within the industry. Moreover, the findings suggest implementing a facilitator role specifically for online sessions. This role could ease communication burdens on educators and focus more on enhancing engagement among participants during online sessions. Enhancing the quality of online learning can promote flexible learning opportunities within the educational system, as recommended by Te Pūkenga. The results highlighted that factors such as student health concerns, travel limitations, and work commitments lead many students to opt for online learning, even though a majority still prefer traditional on-campus education. To advance the understanding and optimise the implementation of the HyFlex model, future research should aim to gather insights from participants across different tertiary education providers that have already adopted this model. This approach is recommended to achieve a comprehensive understanding of potential areas for

improvement aimed within the HyFlex model. Therefore, future research is crucial for advancing the understanding and refining the implementation of the HyFlex model.

The research data illustrates that the participants represent only a subset of the entire population. Therefore, investigating the viewpoints of students and faculty members from all HyFlex-delivered programmes, encompassing both practical and theoretical courses, could potentially provide more accurate and relevant insights. Additionally, it would be beneficial to gather insights from HyFlex support staff. They can provide immediate information on the constraints faced by students and faculty members during HyFlex sessions. Furthermore, it is recommended to incorporate data gathering techniques such as observations to complement the data collected through questionnaires and interviews. This approach can strengthen the findings by utilising mixed methods to formulate more generalised theories and conclusions that are beneficial for enhancing the HyFlex model for its users at SIT and other institutions.

6.6. Conclusion

This study aimed to explore the factors influencing user experience and satisfaction with the HyFlex model among students and faculty members at the SIT Invercargill campus in NZ. The research also focused on identifying challenges encountered during learning and delivery using the HyFlex model that could impact user experience and satisfaction. To guide the research, four objectives were defined and aligned with theories and frameworks, such as the CoI framework, SAMR model, UDL framework, and Nielsen's 10 usability heuristics, to meet user expectations in both traditional in-class and online educational settings. The PESTEL analysis is utilised to examine specific factors applicable to the education industry.

Fifty-two student responses and eight faculty interviews were analysed using descriptive statistics and thematic approach to derive the important generalised ideas which is essential for widening the user experience and satisfaction of HyFlex model stakeholder at SIT. Findings revealed that majority of the users prefer the traditional on-campus mode over HyFlex modes due to the barrier of maintaining the interaction an assuring the collaboration between learners themselves and their respective faculty members. Situation changes on health, work conditions, travel aspects, personal preferences deviated learners from in-class learning to online mode.

However, the findings showcase that their online learning preference can be get affected due the challenges that students face such as technological, technical, and pedagogical such as lack of knowledge and experience of the faculty members about HyFlex and technical aspects. Some of the technological and communication challenges are common to both learners and educators in HyFlex model at SIT. The research found that the identified shortcomings could potentially be overcome by providing adequate training and establishing guidelines for users. Moreover, the results revealed that enhancing the situation awareness of faculty members and regulating the number of students in a session can also provide opportunities to improve the overall user experience and satisfaction of HyFlex users.

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Appendix A. Ethics Approval

[Removed]

Appendix B. Ethics Application

[Removed]

Appendix C. Questionnaire



Exploring User Experience and Satisfaction with the Hybrid-Flexible (HyFlex) Model at SIT Invercargill Campus Informative Summary for Participants

My name is Namal Balasuriya, and I am currently enrolled in the Master of Applied Management programme at the Southern Institute of Technology (SIT) Te Pūkenga, in Invercargill, New Zealand. I am also working as a part-time tutor in the Bachelor of Information Technology programme at the SIT Invercargill campus.

I am conducting a research project that involves exploring experiences and satisfaction with the HyFlex model from students' perspective. To achieve this, I am seeking the participation of **50 to 60 students** who were enrolled in any courses offered through HyFlex. Therefore, if you have been enrolled in any courses offered through HyFlex, your participation in this questionnaire would be greatly appreciated.

- Taking part in this questionnaire is entirely voluntary, and you have the freedom to choose whether to participate or not.
- Filling out this questionnaire should take approximately **15 to 20 minutes**.
- No personally identifying information such as names, emails, or phone numbers will be collected.
- Ethnic information, if recorded during data collection, will not be included in the analysis.
- My supervisor and I will have access to the research data. All original and converted digital data will be retained for five years on a password-protected computer at SIT and will then be securely deleted.
- The results will be compiled into a thesis, which will then be submitted to the Faculty of New Media, Arts, Business and Computing. A report copy may be accessible through the SIT via Research Bank website. The thesis, either in its entirety or a portion of it, may potentially be made available online, allowing public access.
- This research is being conducted with approval from SIT's Ethics Committee to ensure ethical standards are met.

If you have any questions, please feel free to contact my supervisor, Dr. Naveed ur Rehman, at:

Naveed.UrRehman@sit.ac.nz

Thank you sincerely for your time and assistance in this research endeavour.

Best Regards,

Namal Balasuriya



Exploring User Experience and Satisfaction with the Hybrid-Flexible (HyFlex) Model at SIT Invercargill Campus

Questionnaire

Section 1 – Participant Information

1. What is your age? (Select one that apply)
 - a) 16-20
 - b) 21-25
 - c) 26-30
 - d) 31-34
 - e) 35-39
 - f) 40-44
 - g) 45-49
 - h) 50-54
 - i) 55 or above
2. Which of the following best describes your gender? (Select one that apply)
 - a) Male
 - b) Female
 - c) Gender Diverse
 - d) Prefer not to say
3. What is your occupation? (Select one that apply)
 - a) Student
 - b) Employed (Full-time)
 - c) Employed (Part-time)
 - d) Self-employed
 - e) Unemployed
4. What is your highest academic qualification? (Select one that apply)
 - a) High School
 - b) Certificate
 - c) Diploma
 - d) Bachelor's Degree
 - e) Graduate Certificate/Graduate Diploma
 - f) Bachelor Honours Degree
 - g) Postgraduate Certificate/Postgraduate Diploma
 - h) Master's Degree
 - i) Doctoral Degree

Section 2 – HyFlex Experience and Setup

1. How many years of experience you have with the HyFlex? (Select one that apply)
 - a) No experience

- b) 1 year
- c) 2 years
- d) 3 years
- e) Above 3 years

2. Which courses have you been enrolled in with the HyFlex?

3. How did you arrange a device for attending study sessions when outside of the physical classrooms? (Select all that apply)
- a) Pre-owned device
 - b) Newly purchased device
 - c) Device borrowed from SIT
 - d) Device borrowed from someone
 - e) Other (please specify): _____
4. What challenges did you encounter while learning through HyFlex? (Select all that apply)
- a) Software issues
 - b) Device failures
 - c) Internet connectivity issues
 - d) Challenges encountered in interacting with other classmates
 - e) Challenges encountered in interacting with the tutor
 - f) Challenges with maintaining focus
 - g) Challenges regarding knowledge transfer
 - h) Physical difficulties
 - i) Other (please specify): _____

Section 3 – Traditional On-Campus Mode in HyFlex

1. How often did you attend classes in the traditional on-campus mode within the HyFlex model? (Select one that apply)
 - a) Never (0 of 10 instances)
 - b) Rarely (1 to 3 of 10 instances)
 - c) Occasionally (4 to 6 of 10 instances)
 - d) Frequently (7 to 9 of 10 instances)
 - e) Always (10 of 10 instances)(if answer is “(a) Never”, skip this section)

2. How would you rate your experience of interacting with your classmates while learning in this mode? (Select one that apply)
 - a) 1 – Not satisfied
 - b) 2
 - c) 3
 - d) 4
 - e) 5 – Very satisfied

3. How would you rate your experience of interacting with your tutor while learning in this mode? (Select one that apply)
 - a) 1 – Not satisfied
 - b) 2
 - c) 3
 - d) 4
 - e) 5 – Very satisfied

4. How would you rate your experience of maintaining focus while learning in this mode? (Select one that apply)
 - a) 1 – Not satisfied
 - b) 2
 - c) 3
 - d) 4
 - e) 5 – Very satisfied

5. How would you rate your experience of knowledge transfer while learning this mode? (Select one that apply)
 - a) 1 – Not satisfied
 - b) 2
 - c) 3
 - d) 4
 - e) 5 – Very satisfied

6. How frequently you encounter physical stress while learning in this mode? (Select one that apply)
 - a) 1 – Never (0 of 10 instances)
 - b) 2 – Rarely (1 to 3 of 10 instances)
 - c) 3 – Occasionally (4 to 6 of 10 instances)
 - d) 4 – Frequently (7 to 9 of 10 instances)
 - e) 5 – Always (10 of 10 instances)

7. How frequently you encounter mental stress while learning in this mode? (Select one that apply)
 - a) 1 – Never (0 of 10 instances)
 - b) 2 – Rarely (1 to 3 of 10 instances)
 - c) 3 – Occasionally (4 to 6 of 10 instances)
 - d) 4 – Frequently (7 to 9 of 10 instances)
 - e) 5 – Always (10 of 10 instances)

8. How would you rate your overall satisfaction with meeting learning objectives in this mode? (Select one that apply)
 - a) 1 – Not satisfied
 - b) 2
 - c) 3
 - d) 4
 - e) 5 – Fully satisfied

Section 4 – Online Streamed Mode in HyFlex

1. How often did you attend classes in the online streamed mode within the HyFlex model?
(Select one that apply)
 - a) Never (0 of 10 instances)
 - b) Rarely (1 to 3 of 10 instances)
 - c) Occasionally (4 to 6 of 10 instances)
 - d) Frequently (7 to 9 of 10 instances)
 - e) Always (10 of 10 instances)(if answer is “(a) Never”, skip this section)

2. What are the reasons of classes in this mode? (Select all that apply)
 - a) Health conditions
 - b) Traveling issues
 - c) Family commitments
 - d) Employment constraints
 - e) Personal preferences
 - f) Other (please specify): _____

(Q2 to Q8 of Section 3 will be repeated to evaluate the experience of students in this mode of HyFlex)

Section 5 – Recorded Sessions in HyFlex

1. How often did you attend classes in the recorded sessions mode within the HyFlex model?
(Select one that apply)
 - a) Never (0 of 10 instances)
 - b) Rarely (1 to 3 of 10 instances)
 - c) Occasionally (4 to 6 of 10 instances)
 - d) Frequently (7 to 9 of 10 instances)
 - e) Always (10 of 10 instances)(if answer is “(a) Never”, skip this section)

2. What were the reasons for attending classes in this mode? (Select all that apply)
 - a) Health conditions
 - b) Traveling issues
 - c) Family commitments
 - d) Employment constraints
 - e) Personal preferences
 - f) Other (please specify): _____

(Q2 to Q8 of Section 3 will be repeated to evaluate the experience of students in this mode of HyFlex)

Section 6 – Assessments in HyFlex

1. How would you rate your experience of taking controlled/monitored assessments (e.g. tests and exams) in on-campus mode of HyFlex? (Select one that apply)
 - a) 0 – Not applicable
 - b) 1 – Not satisfied
 - c) 2
 - d) 3
 - e) 4
 - f) 5 – Fully satisfied

2. How would you rate your experience of taking uncontrolled/non-monitored assessments (e.g. assignments) in on-campus mode of HyFlex? (Select one that apply)
 - a) 0 – Not applicable
 - b) 1 – Not satisfied
 - c) 2
 - d) 3
 - e) 4
 - f) 5 – Fully satisfied

3. How would you rate your experience of taking practical/lab assessments in on-campus mode of HyFlex? (Select one that apply)
 - a) 0 – Not applicable
 - b) 1 – Not satisfied
 - c) 2
 - d) 3
 - e) 4
 - f) 5 – Fully satisfied

4. How would you rate your experience of taking controlled/monitored assessments (e.g. tests and exams) in online mode of HyFlex? (Select one that apply)
 - a) 0 – Not applicable
 - b) 1 – Not satisfied
 - c) 2
 - d) 3
 - e) 4
 - f) 5 – Fully satisfied

5. How would you rate your experience of taking uncontrolled/non-monitored assessments (e.g. assignments) in online mode of HyFlex? (Select one that apply)
 - a) 0 – Not applicable
 - b) 1 – Not satisfied
 - c) 2

- d) 3
- e) 4
- f) 5 – Fully satisfied

6. How would you rate your experience of taking practical/lab assessments in online mode of HyFlex? (Select one that apply)
- a) 0 – Not applicable
 - b) 1 – Not satisfied
 - c) 2
 - d) 3
 - e) 4
 - f) 5 – Fully satisfied

Section 7 – Feedback

1. Could you share any aspects of HyFlex model that required additional consideration or adjustment on your part?
-

2. Are there any areas in HyFlex model you felt could be enhanced or improved upon to better meet your needs?
-

Number of questions in each section:

Section 1: 04

Section 2: 04

Section 3: 08 (Section may be skipped depending on the answer to the first question)

Section 4: 09 (Section may be skipped depending on the answer to the first question)

Section 5: 09 (Section may be skipped depending on the answer to the first question)

Section 6: 06

Section 7: 02

Total: 19 to 42

Appendix D. Interview Questions



Exploring User Experience and Satisfaction with the Hybrid-Flexible (HyFlex) Model at SIT Invercargill Campus **Interview Questions for Faculty Members**

1. What computer software and hardware did you use while delivering in HyFlex model at SIT?
2. How would you describe your experience with the HyFlex model in terms of its flexibility in meeting the needs of learners?
3. What strategies did you find effective in facilitating meaningful engagement between learners and yourself (as tutor)?
4. What strategies did you find effective in facilitating meaningful collaboration between learners?
5. What strategies did you find most effective in evaluating learners' understanding and progress in HyFlex model?
6. How do you perceive the differences in learners' focus in the various modes of delivery, such as traditional on-campus classes, online learning, or HyFlex?
7. How do you perceive the effectiveness of knowledge transfer in the various modes of delivery, such as traditional on-campus classes, online learning, or HyFlex?
8. Could you share any aspects of conducting HyFlex live sessions that required additional consideration or adjustment on your part?
9. Could you share any aspects of pre-recording HyFlex sessions that required additional consideration or adjustment on your part?
10. Are there any areas in HyFlex model you felt could be enhanced or improved upon to better meet your needs?

Appendix E. Participant Information Sheet



Exploring User Experience and Satisfaction with the Hybrid-Flexible (HyFlex) Model at SIT Invercargill Campus

Information Sheet for Participants

Thank you for showing your interest in this project. Please carefully review this information sheet before deciding whether to participate. If you choose to participate, I extend my gratitude. If you opt not to take part, there will be no disadvantages for you, and I appreciate your consideration of my request.

Introduction

My name is Namal Balasuriya, and I am currently enrolled in the Master of Applied Management programme at the Southern Institute of Technology (SIT) Te Pūkenga, in Invercargill, New Zealand. I am also working as a part-time tutor in the Bachelor of Information Technology programme at the SIT Invercargill campus.

The emergence of online teaching as a response to the COVID-19 pandemic has significantly impacted the education industry. In 2021, the Southern Institute of Technology (SIT) Invercargill campus implemented the Hybrid-Flexible (HyFlex) model across multiple departments. Such an approach utilises a combination of software and hardware technologies to fulfil delivery, assessment, and evaluation needs.

My focus of research revolves around exploring user experience and satisfaction with the HyFlex model at SIT Invercargill campus.

What is the aim of the project?

This study aims to identify the user experience from both students' and faculty members' perspectives, and to uncover the challenges they encounter. Additionally, this study also seeks to assess the degree of satisfaction with this model aiming to gauge its effectiveness and impact. The findings of this research are intended to benefit the range of stakeholders of this model, both within and outside of SIT. These findings will inform strategies aimed at enhancing the productivity and effectiveness of HyFlex in the future.

What type of participants are being sought?

Faculty members who have already delivered paper(s) using HyFlex at the SIT Invercargill campus are being sought.

What will participants be asked to do?

Potential participants would be asked to sign a Consent Form. They will then be interviewed either online or in-person that would take approximately 40 to 60 minutes.

- Online interviews: Interviews will be conducted and audio-recorded through virtual calls using platforms such as Skype, Zoom, Teams, or Google Meet.
- In-person interviews: Interviews will be conducted face-to-face and audio-recorded using a password-protected smart phone.

All further communication between the researcher and the participants will be via email.

Can participants change their minds and withdraw from the project?

Participants have the option to withdraw from the project at any time without incurring any disadvantages to themselves, as long as their withdrawal occurs before the interviews are recorded.

What data or information will be collected and what use will be made of it?

The interview session is organised to gather participants' user experience and degree of satisfaction about delivering paper(s) through HyFlex model.

The data or information collected during the interview session will be used to derive meaningful results after performing various analysis methods.

What will happen to the results?

The results will be incorporated into my thesis, which will be assessed as part of my study programme. The completed thesis may be accessible through SIT's Research Bank website. The thesis, either in its entirety or a portion of it, may potentially be also made available online, allowing public access.

How will the data be stored?

I and my supervisor will have access to the research data. All original and converted digital data will be retained for five years on a password-protected computer at SIT and will then be securely deleted.

What if you have any questions about the project?

If you have any questions about the project, either now or in the future, please feel free to contact:

Researcher: Namal Balasuriya
Email: 2023002002@student.sit.ac.nz

Supervisor: Dr. Naveed ur Rehman
Southern Institute of Technology
Email: Naveed.UrRehman@sit.ac.nz

This research has been approved by the Human Research Ethics Committee at SIT.

If you have concerns about the ethical conduct of this research or the researchers, the following procedure should occur.

Write to the following:

The Secretary of the Human Research Ethics Committee
Southern Institute of Technology
133 Tay Street
Invercargill 9840
New Zealand
Tel: 03 211 2699

All information is confidential and will be handled as soon as possible.

Appendix F. Consent Form



Declaration of Consent to be Interviewed for “Exploring User Experience and Satisfaction with the Hybrid-Flexible (HyFlex) Model at SIT Invercargill Campus”

I have had the scope and nature of the research fully explained to me. Any questions about the research have been satisfactorily answered, and I understand that I may request further information at any stage. I accept and note that:

1. My participation in this research is entirely voluntary.
2. I may withdraw from participation in the research at any time up to the point at which the data is anonymised and amalgamated, without explanation, disadvantage, or disincentive.
3. The information given during the interview is being utilised solely for the purpose of the specific research project and will not be disclosed to any other person or agency without my express consent.
4. The interview will be recorded for later transcription.
5. This information may be incorporated into the research report but actual names or other characteristics that may lead to identification of individuals or organisations will not be disclosed.
6. I may at any time request to view any completed drafts or sections of the research report to which I have contributed.
7. A copy of the completed research report will be made available to me, on request, at the conclusion of the research.

DECLARATION

I have read and understood the information set out on this form and give my informed consent to be interviewed in accordance with the stated terms and conditions.

Name of Participant:

Name of Researcher/Interviewer:

.....

.....

Signature

Signature

.....

.....

Date

Date

.....

.....