INVESTIGATING THE HYFLEX MODALITY:

STUDENTS' SATISFACTION AND IMPACT ON LEARNING

By
Bouchra Bakach

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Chair of Committee: Dr. Sara McNeil

Co-Chair of Committee: Dr. Miao Li

Committee Member: Dr. Margaret Hale

Committee Member: Dr. Neil Eldin

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Dedication

I dedicate my dissertation work to my parents, who instilled in me very early and often the importance of education and hard work. Thank you for believing in me and for devoting your lives tirelessly to support my educational goals.

I also dedicate this work to my husband, Dr. Driss Benhaddou, and our kids Ilias, Faris and Salma. Their love, support and encouragement allowed me to pursue this dream.

Abstract

Background: The 2020 pandemic disrupted the higher education system. However, it provided an opportunity to re-examine the teaching modes and propagate innovative and flexible learning modalities. The HyFlex course was one of those modalities that flourished because of the challenges imposed by the pandemic. Universities across the nation offered HyFlex classes during the pandemic as a solution to open their campuses while offering students a flexible attendance choice. A HyFlex course simultaneously offers face-to-face, online synchronous, and online asynchronous instruction modalities. Students can choose to attend each session that works best for their current circumstances. Although the HyFlex modality has existed since 2006, there is scarce research exploring its impact on learners' satisfaction and learning especially, on nontraditional students. **Purpose:** This study assessed the students' satisfaction with the HyFlex modality and their perceptions of its impact on their learning. It also compared the level of satisfaction and perceived impact on learning for traditional and nontraditional students. In addition, the study explored factors that influenced students' satisfaction and perceived learning. **Methods**: This online study adopted a convergent mixed methods approach with a questionnaire variant that included closed and opened-ended questions. The study involved 162 undergraduate students enrolled in HyFlex courses in a college of technology in a large urban public university in the southern region of the United States. The participants were a mix of traditional and non-traditional students. The quantitative data were analyzed using descriptive and inferential statistics. The qualitative data were analyzed using inductive thematic analysis. **Findings**: The results of the quantitative analysis indicated that 93.1% were satisfied with the HyFlex

modality. Only 4.3% were dissatisfied. Also, 95.7% of students perceived that the HyFlex modality had a positive impact on their learning. The nontraditional students indicated a higher level of satisfaction and a more positive perception of the impact of this modality on their learning than the traditional students. The findings from the qualitative analysis revealed that students' satisfaction and the positive impact was mainly attributed to the flexible attendance mode, which enabled them to balance the demands of their education and other obligations and eliminated many personal stressors. The recorded lectures were reported highly beneficial to students' learning outcomes. Despite the high level of satisfaction and the positive impact of the HyFlex modality on student learning, some students reported some concerns related to personal preferences and roles, instructors' skills and attitudes, and suitability of the HyFlex for certain types of classes/subjects. **Conclusion:** This study suggests that the HyFlex modality is promising in addressing students' needs of flexibility and convenience while providing them with a positive learning experience and outcomes. However, to fully achieve its potential, this modality requires students to be self-regulated, instructors to be trained to teach in this modality and have a positive attitude toward it, and classrooms to be adequately equipped with the needed technology.

Keywords: flexible attendance policy; HyFlex; impact on learning; nontraditional students; recorded lectures; students' satisfaction; traditional students

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Chapter I

Introduction

The National Center for Education Statistics (NCES) reported that student enrollment in colleges and universities will continue to increase 3% in the period 2017-2028 (NCES, 2020). Globalization, automation, and a shift towards skilled services have necessitated college degrees for good wages (Carnevale et al., 2018). According to several reports by Georgetown University Center on Education and the Workforce, in today's society, a college degree has become a must for decent-paying jobs (Carnevale & Ban, 2018; Carnevale & Rose, 2015; Chan, 2016). Moreover, the Education Commission of the States reported in 2017 that education leaders are focused on closing the gap between education and employment requirements (Fulton, 2017). It is projected that by 2020 about 65% of job openings will require college/university education. It also reported that most of the states are attempting to achieve the goal of getting 55-65% of their citizens to obtain postsecondary credentials by 2025 (Fulton, 2017).

Due to the shift in the workforce to more technology-based jobs and the increased demands for postsecondary training and degrees, higher education institutions have experienced record-high enrollment from an influx of older students, known as "nontraditional students." (Swanson et al., 2006; Sweet & Moen, 2007). Also, due to the advent of e-learning, higher education attracted more nontraditional students who had the "desire and the means but not the ability to attend in-person classes." (Remenick, 2019).

Students in higher education are classified as nontraditional when they satisfy at least one of the following criteria: 1) be at least 25 years old, 2) attend school part-time, 3) work full-time, 4) be a veteran, 5) delay enrollment into postsecondary education, 6)

have a GED instead of a high school degree, 7) be a first-generation student, 8) be financially independent for financial aid purposes; 9) have dependents other than a spouse; 10) be a single parent; and 11) enroll in non-degree programs or have reentered a college program (MacDonald, 2018; National Center for Education Statistics, 2018).

In 2015, the National Center for Education Statistics (NCES) reported that more than 70% of undergraduate college students have at least one nontraditional characteristic (Radford et al., 2015). NCES also reported that the number of older college students (age 25 to 34) increased by 41 percent between 2000 and 2017 (Hussar & Bailey, 2020). The same researchers projected that the number of nontraditional college students between 2015 and 2026 would continue to increase by 11% (Hussar & Bailey, 2018)

Nontraditional students are not the typical fresh high school graduates who are enrolled full-time in college. They usually carry other commitments related to the many roles they serve in their communities. They are often parents, full-time employees, spouses, family caregivers, and retirees (Hittepole, 2019). According to a 2015 report by Georgetown University Center on Education and the Workforce (CEW), more than 70 percent of college students work while pursuing their college education (Carnevale et al., 2015). One-third of these working students are 30 years or older, 25% of them have children, and 25% are full-time employees (Carnevale et al., 2015). It is bound that these multiple roles and commitments compete on one's time and availability. Often, they result in one's inability to fulfill the education requirements while attending to the other obligations. Such conflicts could deny these individuals the opportunity to become students and stay the course to complete their studies (Fortin et al., 2016; Markle, 2015).

Many studies confirmed that nontraditional students struggle to complete their

degrees because of difficulties in balancing the demands of the family, work, and school. Since the topic of nontraditional students started appearing in the literature, researchers have noted that course flexibility and convenience ranked at the top of the students' needs (Berling, 2013). As a result, higher education administrators have been searching for ways to offer courses in more flexible formats to accommodate the increasing population of traditional and nontraditional students. For example, universities started offering multiple class schedules (day, evening, and weekends). They also started offering classes in various modalities (face-to-face, online, and hybrid) (). Indeed, these different schedules and modalities offer some choices and flexibility. However, the nontraditional students were still locked into predetermined schedules/modalities set by the instructor/institution for the entire semester (Goncalves & Trunk, 2014). These schedules/modalities did not offer a means for switching the time/place/modality throughout a semester based on needs, unscheduled events, and personal preferences (Croft et al., 2010).

To illustrate, hybrid classes offer some flexibility, but students still must attend numerous class meetings on predetermined dates and times. Also, while online classes offer convenience to nontraditional students, students in these classes often feel isolated due to a lack of personal interaction with instructors and classmates (Croft et al., 2010). Therefore, the options offered still fell short of giving the necessary degree of flexibility for the nontraditional students to avoid conflicts between their class schedules and the continuing changes in the schedules dictated by their other obligations.

Research Impetus

In 2020, the COVID-19 pandemic forced universities worldwide to change their

mode of operation and quickly move their traditional, in-person classes to distance education. However, this forced move has allowed many higher education institutions to reexamine their modes of instruction (Marsicano et al., 2020). It has also allowed them to expand into more innovative and effective teaching modes and pursue more flexible learning environments (Baker et al., 2020; Marinoni et al., 2020). After the passing of the pandemic peak, some institutions chose to reopen for in-person instructions, others chose online (synchronous or asynchronous), and some offered mixed modalities (Baker et al., 2020; Marsicano et al., 2020).

To safely reopen in the fall of 2020, the university where this study was conducted decided to offer some of its classes in the Hybrid-Flexible modality (HyFlex). This modality was pioneered in 2006 by Dr. Brian Beatty of San Francisco State University (Beatty, 2007, October; Beatty, 2019; Koskinen, 2018; Miller et al., 2013). Even though the HyFlex concept has been around for over a decade, it gained significant popularity during the 2020 pandemic (Irvine, 2020). It was considered by higher education institutions as a solution to open campuses safely by providing students with attendance flexibility to suit the individual's needs (Maloney & Kim, 2020).

The HyFlex modality offers more flexibility to students than the Hybrid learning environment(Abdelmalak & Parra, 2016). Beatty (2014) indicates that the Hyflex course is where the instructor "implements a flexible participation policy." When students enroll in a HyFlex course, they have the freedom to attend each class session in the mode that works best for them at that particular time. For each class session, a student could attend in-person, synchronously online, or review the recorded lectures to complete the learning activities (Beatty, 2019). In the HyFlex model, students are in complete control of how

they choose to attend each class and engage with the learning activities (Beatty, 2019). The HyFlex course provides students with the opportunity to control the course time and delivery format. They can keep changing their preferences throughout the semester. Students can continually switch their course attendance modality (i.e., face to face, online synchronous, online asynchronous) and participate in the course in the mode that best suits their circumstances at that particular time. The HyFlex modality provides students (primarily nontraditional) with the needed flexibility of class time and delivery format, promoting their academic success (Rhoads, 2020).

Problem Statement

Searching for new, innovative, and sustainable approaches to college education have become necessary. This search has been further enforced to cope with: a) the demands that have been recently created by the disruption of the COVID-19 pandemic (Baker et al., 2020; Colasante et al., 2020; Marsicano et al., 2020) and b) the growing demands for flexible learning possibilities to meet the needs of the increasing number of nontraditional students that have existed for a couple of decades (Compton & Schock, 2000; Hittepole, 2019; MacDonald, 2018; Remenick, 2019).

The COVID-19 pandemic imposed the challenge of balancing the health risk inherent in offering the various teaching modalities. It called attention to adopting a teaching model that provides social distancing while addressing students' learning preferences. The HyFlex teaching model provides students with the flexibility needed during the pandemic and also offers "insights into new modes of teaching that might displace traditional F2F" (Glantz & Gamrat, 2020, p. 280).

Although few studies investigated students' satisfaction with the HyFlex classes

and explored the impact of this modality on students learning (Abdelmalak, 2014; Binnewies & Wang, 2019; Gobeil-Proulx, 2019; Kyei-Blankson et al., 2014; Lakhal et al., 2014; Miller et al., 2013; Nur-Awaleh & Kyei-Blankson; Rhoads, 2020; Wright, 2016), no study addressed the differences in satisfaction and perceived learning between traditional and nontraditional undergraduate students.

The researcher has become interested in investigating this learning modality because of its potential to solve multiple problems. During the pandemic, it offers the flexibility necessary to accommodate the need for safety and social distancing. After the pandemic, HyFlex courses could offer the flexibility demands of the increasing number of nontraditional students in order for them to balance their professional and social obligations with their educational aspirations.

Purpose of the Study

The purpose of this mixed-methods study was to explore the level of satisfaction of the undergraduate students with the HyFlex modality and to investigate the impact of the flexible attendance policy (inherent in HyFlex courses) on the students' perceived learning. The study also examined whether the satisfaction and perception of the nontraditional students varied from the traditional students.

Research Questions

The primary research questions of this study are as follows:

RQ1: How do students perceive their overall satisfaction with the HyFlex courses?

 RQ2. Is there a statistically significant difference between Nontraditional students' and traditional students' overall satisfaction with the HyFlex modality?

RQ3. Is there a correlation between students' overall satisfaction and the subscales of

"HyFlex Content and Delivery"?

RQ4: How do students perceive the impact of HyFlex modality on their learning?

RQ5. To what extent, if any, is there a statistically significant difference between how nontraditional and traditional students perceive the impact of the HyFlex modality on their learning?

RQ6. How does perceived learning relate to students' intention to enroll in HyFlex classes in the future?

Context of the Study

This study was conducted at a major public university (45,000 students) in Southern USA. The HyFlex courses involved in the study were offered by a larger college (over 6,000 students). The college has a high percentage of nontraditional students. Judging by the 2016-2021 data, the average age is 24 years, and 36% are part-time students. The college grants eleven undergraduate and nine graduate degrees. The college offers an average of 516 courses every semester, of which about 250 are delivered face-to-face, 129 online, and 135 in a hybrid/blended mode. Due to the 2020 pandemic, the college offered 60 HyFlex classes during the fall 2020 semester and 22 HyFlex classes in the spring 2021 semester.

This study involved the undergraduate students enrolled in 22 HyFlex courses offered by the college in the spring of 2021. The total enrollment in those classes was about 222 students. A target of 100 participants was set for this study. Participation in the study was voluntary, and the data was collected through a questionnaire that contained closed and open-ended questions.

Significance of the Study

Although the limited adoption of HyFlex teaching showed promising benefits, only limited research is available on this teaching modality (Abdelmalak, 2014; Abdelmalak & Parra, 2016, 2018; Beatty, 2007, October; Gobeil-Proulx, 2019; Heilporn & Lakhal, 2021; Lakhal et al., 2014; Miller & Baham, 2018; Miller et al., 2013; Sowell et al., 2019; Wright, 2016). In fact, searching the ProQuest Dissertations and Thesis Global database showed over 5,102,960 studies in which only seven dissertations involved exploring the HyFlex teaching modality (Carter, 2021; Donovan, 2018; Koskinen, 2018; Love, 2015; Nelson, 2021; Rhoads, 2020; Snelgrove, 2019). This study presented here contributes to filling this gap in the limited existing research on the HyFlex modality. It also assists higher education administrators in understanding the determinants of students' satisfaction with HyFlex courses and factors leading to students' success or failure when studying in this modality. The findings of this study also contributed to identifying the groups of students best suited for the HyFlex course offerings, which could significantly contribute to increasing students' enrollment and retention.

An in-depth understanding of the success factors and barriers that influence students' satisfaction and success is crucial to clarify the necessary vision to offer appealing programs that fit the expanding and diverse student population. The findings of the study should be beneficial to instructors, instructional designers, and administrators. It provides additional insight into designing courses that address the preferences of a large population of students. Continuing to offer more HyFlex courses will accommodate the various students' needs and likely increase enrollment and retention.

Study Limitations

There were a few limitations that could affect the results and conclusion of this study. The following are examples of such limitations:

1. The study was limited to only undergraduate students in one college. However, the researcher was careful in stating the conclusions to clarify this fact.

2. The participation of the students was voluntary. Therefore, a larger number of participants could not be obtained.

3. The researcher has no control over the design or the delivery of the HyFlex courses. Some instructors were not well-versed in the proper design of HyFlex courses and all the elements needed for proper delivery. Therefore, some students were affected by this lack of knowledge, and this was reflected in their level of satisfaction with the HyFlex courses. A number of students alluded to this issue.

4. Because of the interpretative nature of the qualitative data, there has been a potential for the researcher bias in the data analysis and the research findings. However, to ensure the credibility of the qualitative finding, the researcher invited an external coder who checked the accuracy of the researcher's coding and themes. Also, the researcher invited feedback from her dissertation advisory committee members.

5. Since the study was conducted during a global pandemic disruption, it is possible that the students' judgments and feelings were influenced by their high emotions/anxiety during this challenging time.

Definitions of Key Terms

Andragogy. The theory of adult learning. Knowles et al. (2005) define andragogy as and the "art and science of helping adult learn" (p. 40).

Blended Learning. A teaching approach that combines face-to-face learning activities and online learning activities (Lakhal & Meyer, 2019).

Flexible Learning. A student-centered teaching approach, which holds the learners' needs and preferences at focus in front of the decision-makers.

HyFlex Course. Called also Hybrid Flexible course. It is a hybrid course that provide students with the flexibility and choice to attend each class session in the mode that works best for them. Students could attend the session in-person, synchronously online, or review the recorded lectures and complete their learning activities at a time that suits them (Beatty, 2019).

Online Synchronous Course. A course in which the students and instructor are geographically separated but meet via a web conferencing tool at a scheduled time.

Online Asynchronous Course. A fully online course in which the students complete coursework on their own, according to stated deadlines. Students are not required to attend any real-time online or face-to-face meetings.

Nontraditional Students. Higher education students that have at least one of these characteristics: a) being 25 years or older, b) being financially independent, c) enrolling in college part-time, d) delaying enrollment into postsecondary education by a year or more after high school, e) being employed fulltime, f) having dependents other than a spouse, g) Having a GED (Radford et al., 2015)

Traditionality Status. Being categorized as a traditional or nontraditional student.

Summary

Chapter one provided an introduction to the study, including the background of the topics addressed and the impetus behind selecting this specific topic. An explanation of the problem was presented, along with a statement of the study purpose and guiding research questions. The significance of the study was provided, followed by the study limitations and definitions of key terms. Chapter two provides a review of literature related to andragogy, nontraditional students, the different delivery modalities, and the HyFlex modality.

Chapter II

Literature Review

This chapter offers a literature review of five related topics: 1) andragogy, 2) adult learners, 3) nontraditional students, 4) flexible learning, and 5) the HyFlex modality. These interconnected topics are presented in a sequence based on the following rationale.

Since this study is focused on college students, a definition and discussion andragogy (adult learning) are presented first. A literature review on the topic of adult learners is offered second. This study involved the understanding of how the HyFlex modality impacts nontraditional students. Therefore, this chapter offers a discussion of the characteristics and needs of these students. The next topic presented is blended learning, under which the HyFlex teaching mode exists. The HyFlex modality, its framework, and studies conducted on its impact on students are discussed last. This chapter concludes with a summary.

Literature Search Strategy

The literature review was based on an extensive search conducted through the following databases: Eric (EBSCOhost), Education Source, Professional Development Collection, SocINDEX with Full Text, and Dissertations and Thesis Global. Also, the researcher used Google and Google Scholar.

The following search terms and categories were used to find relevant literature related to the HyFlex modality: "HyFlex course," "Hybrid flexible course," "HyFlex design," "HyFlex course design," "HyFlex modality," "HyFlex delivery," "Hyflex mode," "Hyflex learning environment," "multimodal course," "Flexible learning," "flexible delivery," "blended synchronous," "blended course," "Hybrid course."

Since the HyFlex model was developed in 2006, the search date concerning this topic was set from 2006 to 2021. However, the search period for the other topics was limited to the last five years to capture the most recent findings. Some exceptions were made to include older literature when relevant to the study. Also, the researcher limited the sources to peer-reviewed articles, book chapters, peer-reviewed conference proceedings, online e-books, printed books, and dissertations. The researcher also used Google and Google scholar to find more literature, especially government reports and significant academic podcasts.

The search was limited to English and French languages. Some relevant studies conducted in Canada were published in French (Gobeil-Proulx, 2019; Lakhal et al., 2015). The researcher is fluent in French and easily translated the articles.

Andragogy

Andragogy is a derivative of the Greek word "aner," which means adult (Knowles et al., 2005, p. 293). The andragogy terminology was introduced by German Alexander Kapp back in 1833 and later introduced in the United States by Dusan Savicevic, a Yugoslavian adult educator (Loeng, 2018). The term "andragogy" was used in the American educational discussions by Edward Lindeman back in the 1920s (Loeng, 2018). However, the andragogical theory of adult education was further developed in the 1970s by Malcolm Knowles (Loeng, 2018), who is commonly known as the father of andragogy (Iloh, 2018; Knowles et al., 2005)

The first article on the andragogy subject was published in 1968 by Malcolm Knowles in the Journal of Adult Leadership. Knowles followed by publishing two books: "The Modern Practice of Adult Education: Andragogy Versus Pedagogy" in 1970, and

"The Adult Learner" in 1973; and hence associated his name with adult education

(Loeng, 2018). Henschke (2009) declares that Knowles became the catalyst for the

andragogical movement when he "provided the most articulate expression and most

complete understanding of andragogy from the American perspective" (Henschke, 2009,

p. 840). In his work, Knowles presented andragogy as a cohesive theoretical framework

of adult learning instead of pedagogy.

      Andragogy is the "art and science of helping adults learn" (Knowles et al., 2005,

p. 36), while pedagogy is the "art and science of teaching children" (Knowles et al., 2005,

p. 61). However, other scholars have described andragogy differently. Muduli et al.

(2018) defined andragogy as a learner-centered teaching philosophy that assumes that

adult students are "independent and sovereign learners who take the initiative in, control

of, and responsibility for achieving their learning goals, and assumes that the teacher

plays the role of a facilitator, emphasizing the problems rather than the contents (Muduli

et al., 2018, p. 169). Beder and Carrea (1988) upheld that andragogy is a "guiding

principle on how best to educate adults" (p. 75). Davenport and Davenport (1985) viewed

andragogy as "a theory of adult education, theory of adult learning, theory of technology

of adult learning, method of adult education, technique of adult education, and a set of

assumptions" (p. 6).

      In contrast to pedagogy, andragogy underscores the student's characteristics and

internalized needs instead of the teaching process itself. Accordingly, understanding of

why and how adults learn is the essence of andragogy. Pedagogy could be viewed as a

content model, whereas andragogy could be viewed as a process model (Charungkaittikul

& Henschke, 2018). According to Knowles et al. (2005), the "content model is concerned

with transmitting information and skills, whereas the process model is concerned with providing procedures and resources for helping learners acquire information and skills" (p.115). To successfully teach adult learners, Knowles et al. (2005) proposed six principles of andragogy. These principles are a set of core assumptions about adult learners intended to guide the teaching of adults.

The andragogy learning theory emphasizes the characteristics of adult learners as being autonomous, independent and self-directed and is based on six andragogical core principles that assume that adult learners: (1) need to know why, what, and how to learn; (2) have self-concept of being autonomous and self-directing; (3) enter into educational process with a wealth of knowledge and prior experiences; (4) are ready to learn to improve their skills and grow in their social roles; (5) are motivated to learn something that they could apply or use to solve problems; and (6) are internally motivated to learn and are driven by a desire of self-esteem and personal payoff (Knowles et al., 2005, pp. 62-63).

The andragogical principles assume that adult learners need to know why they are learning something before they start. This need is prompted by a desire for the new learning to be meaningful and applicable to their professional and personal lives. Therefore, the relevance of the learning content is a crucial concept. Likewise, adult learners need to know what they are learning and how it will benefit them (Chen, 2017; Ferreira et al., 2018; McCauley et al., 2017).

Adult learners have an established self-concept that they are responsible for their own decisions (Knowles et al., 2005). Due to that self-concept, adult learners "develop a deep psychological need to be seen by others and treated by others as being capable of

self-direction. They resent and resist situations in which they feel others are imposing their wills on them." (p. 65). Therefore, andragogy acknowledges that adult learners are independent and autonomous. They are intrinsically motivated to be self-directed and want to take charge and control their learning (Abdelmalak & Parra, 2016; Chen, 2017).

Adult learners value and appreciate their past experiences and build new knowledge on their life experiences (Knowles et al., 2005). Adult learners are more engaged with the learning exercise when linking learning to their life goals (Chen, 2017; Todd et al., 2017). In addition, adult learners appreciate authentic learning activities, which entails solving real-world problems related to their work or life circumstances (McCauley et al., 2017).

Adult learners' motivation to learn something is more intrinsic than extrinsic (Knowles et al., 2005). They usually enter a learning experience for reasons such as personal or career growth, improving knowledge and skills, finding a job, and meeting family needs (Bissessar et al., 2019; Duarte et al., 2018; Hittepole, 2019).

Adult learners are self-directed. They are mature individuals who are self-motivated and capable of directing their learning experience (Knowles et al., 2005). Knowles defined self-directed learning as "a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, as cited in Plews, 2017, p. 41).

Merriam et al. (2007) recognized the complexity of adult learning (and the adult learner) and suggested that there is no one-size-fits-all theory of how adults learn best.

Nonetheless, many have accepted andragogy as the best approach to adult education, the most effective process to help adult learners, and the most well-known adult-learning theory (Merriam et al., 2007; Rachal, 2002). Moreover, Blondy (2007) advocated that Knowles' framework is practical and generates a learner-centered approach that respects the learners' needs and heightens the role played by the learners. The preference for andragogy as an adult learning approach is due to its flexible practice to adapt and fit unique individuals, learning situations, and learning goals (Alajlan, 2015). In fact, (Knowles et al., 2005) emphasized that "andragogy works best in practice when it is adapted to fit the uniqueness of the learners and the learning situation" (p. 3).

According to Dimitrova et al. (2012), "Today's learners, specifically young adults, are independent thinkers, self-regulated, ICT savvy, accustomed to social media and pervasiveness of technologies, motivated by self-realization, and shaped by experience. Hence, modern learning environments should be tailored to adult learning models" (para. 2). It should be expected that these adult learners or nontraditional students need different approaches and learning possibilities. Therefore, instructors should understand the learning process more suitable for adult students to make their learning experience more satisfying and efficient (Iloh, 2018). Furthermore, the continuing changing needs of adult students result in the creations of different teaching approaches (Erisman & Steele, 2015; Malczyk, 2019; Yin & Lim, 2020).

Henschke (2015) stressed that andragogy is often utilized as a theory to guide the scope of research and practice on how adults learn, how they should be taught, and elements that must be considered when adults learn in varying contexts. Therefore, using andragogy as a lens in this study is suitable.

Adult Learners

Many definitions have been suggested to describe adult learners. Knowles (1980), as cited in (Taylor & Kroth, 2009), proposed that two issues should determine when a student is considered an adult learner. The first issue considered the psychological definition of the "image of an adult self" where Knowles indicated "a person is an adult to the extent that the individual perceives herself or himself to be essentially responsible for her or his own life" (Knowles, 1980 as cited in Taylor & Kroth, 2009, p. 5). The second issue considered the "social definition" when a person behaves like an adult and performs adult roles. (Knowles, 198, cited. According to Knowles, "a person is adult to the extent that the individual is performing social roles typically assigned by our culture to those it considers to be adults—the role of worker, spouse, parent, responsible citizen, soldier, and the like" (Knowles, 1980 as cited in Taylor & Kroth, 2009, p. 5). Other researchers took the legal age of eighteen years to define adult learners. They consider adult learners to be individuals who completed high school by the age of eighteen (Clark & Caffarella, 1999; Merriam et al., 2007).

Forrest and Peterson (2006) stated that "adults are those individuals who have taken on adult roles in society, whether they are the 16-year-old mother or the 87-year-old retiree" (p. 114). Similarly, other researchers have defined adult learners as non-traditional students who assumed primary social roles such as workers, spouses, and parents and are not just full-time students (Allen & Zhang, 2015; Yin & Lim, 2020; Yoo & Huang, 2013). This group of researchers advocated that age is irrelevant in comparison with the social role and responsibilities.

Nontraditional Students

In 2018, the National Center for Education Statistics (NCES) proposed three criteria to define nontraditional students (National Center for Education Statistics, 2018). These are enrollment patterns, financial and family status, and high school graduation status. Nontraditional students are characterized by being over 25 years or older, delaying enrollment into postsecondary education, attending college part-time, being financially independent, having dependents other than a spouse, and working a full-time job (National Center for Education Statistics, 2018).

Over the past few decades, the number of nontraditional adult learners has significantly increased on college campuses across the nation (Bowers & Bergman, 2016). According to (Radford et al., 2015), more than 70% of undergraduate college students have at least one nontraditional characteristic. This student population represents a diverse group that has different demographics than that in the past. The differences include students' age, gender, social roles, priorities, and percentage of minority enrolment (McPherson, 2017; Williams, 2014, September 22). A literature review suggests that nontraditional students are increasing faster than traditional students (Woods & Frogge, 2017). According to Cleveland-Innes (2020), nontraditional students' demographic characteristics should include any characteristics different from the characteristics of a fresh graduate of high school (i.e., full-time, young, resident student). The National Center for Education Statistics (2016) reported that 29% of undergraduate students were 25 years or older in 2015. NCES also projected that this percentage will reach 39% by 2029 (National Center for Education Statistics, 2020).

Nontraditional students seeking college education have significantly different needs and face significantly different challenges than traditional learners. Past studies have confirmed that nontraditional students face a higher risk of failure to complete their studies and maintain a lower retention rate (Hittepole, 2019). For example, three million nontraditional students dropped from college between 2013 and 2015, and many never went back to complete their degrees (Shapiro et al., 2015, p. 4).

Many investigations were conducted on the success rate of nontraditional students suggested a vital need of nontraditional students for flexible learning opportunities (Berling, 2013; Brown, 2020; Capozzoli, 2020; Hittepole, 2019). The significance of these needs can be confirmed by the fact that the topic of learning flexibility has ranked atop the research topics in recent years (Berling, 2013).

According to a report published in 2012 by the Advisory Committee on Student Financial Assistance (ACSFA), the traditional classroom instructions with its fixed meeting times, fixed location, and instructor-centered teaching approach are hindrances to the success of nontraditional adult learners (Advisory Committee on Student Financial Assistance, 2012). A significantly increasing number of nontraditional students appreciate courses and programs that provide more flexibility (Palaoag et al., 2020). Such flexibility is crucial to provide the desired balance of work schedules and academic requirements (Education Advisory Board, 2019). This is particularly important because of the increasing number of adult students needing college degrees for career advancements (Zack, 2020).

Providing the desired flexible learning will support nontraditional learners in their struggle with time management to sustain their social roles, professional responsibilities,

and financial obligations while pursuing their college degrees (Ross-Gordon, 2011; Zack, 2020). Indeed, students with career obligations and family commitments would benefit tremendously from flexible learning approaches and environments (Gardner, 2019, February 17). A study conducted by Erisman and Steele (2012) revealed that almost 75% of the students reported that a flexible course schedule was highly prioritized. In a more recent study, attendance flexibility was listed as a reason for pursuing online degree programs (James, 2020).

First-time and returning non-traditional students often start their journey to obtaining a college degree with high spirit and aspiring goals. Once they start this journey, they soon face the severe challenge of maintaining their family and work responsibilities while accommodating strict and non-flexible school requirements. Therefore, the best assistance educators can offer these non-traditional students is to provide them with a truly flexible learning modality such as HyFlex (Beatty, 2019). This teaching mode puts the student in control of how to attend each class session and allows them the opportunity to continually match their school schedule and obligations with their family and professional responsibilities (Abdelmalak & Parra, 2018; Kyei-Blankson et al., 2014).

Flexible Learning

The term "flexible learning" is pretty extensive regarding what it means and how it looks in practice. This is reflected in the literature by the many researchers who attempted to define and describe flexible learning. An early attempt to define this term was in 1993 by Van den Brande. He perceived flexible learning as "enabling learners to learn when they want (frequency, timing, duration), how they want (modes of learning),

and what they want (learners can define what constitutes learning to them)" (Van den Brande, 1993 as cited in Nikolova & Collis, 1998, p. 60). Flexible learning was also defined as "an approach to university education which provides students with the opportunity to take greater responsibility for their learning and to be engaged in learning activities and opportunities that meet their own individual needs" (Wade, Hodgkinson, Smith, and Arfield, 1994 as cited in Hilliam & Williams, 2019, p. 34).

In the context of distance education, Moran and Myringer (1999) defined it as "approaches to teaching and learning which are learner-centered free up the time, place and methods of learning and teaching, and use appropriate technologies in a networked environment." (p. 60). Cassidy et al. (2016) suggested that flexible learning is a "pedagogical approach allowing for flexibility of time, place, and audience, including but not solely focused on the use of technologies." Joan (2013) considered it "a set of educational philosophies and systems, concerned with providing learners with increased choice, convenience, and personalization to suit the learner. In particular, flexible learning provides learners with choices about where, when and how learning occurs." (p.37). Similarly, Lundin (2012) proposed that flexible learning is a "mixture of educational philosophy, pedagogical strategies, delivery modalities and administrative structures which allows maximum choice for differences in student learning needs, styles, and circumstances" (p. 6). Naidu (2017) posited that flexible learning is not a mode of study but rather a value principle. He defined it as "a state of being in which learning and teaching is increasingly freed from the limitations of the time, place and pace of study" (p. 269). Collis and Moonen (2012) regarded it as a paradigm shift "from a situation in which key decisions about learning dimensions are made in advance by the instructor or

institution, towards a situation where the learner has a range of options from which to choose with respect to these key dimensions" (p.10). Andrade and Alden-Rivers (2019) believed that flexible learning approaches are innovative strategies that universities and colleges use to increase access and accommodate diverse learners' needs. Palaoag et al. (2020) considered flexible learning "a learning design perspective deeply rooted in the needs of students, with the main objective of providing them with the most flexible learning content, schedules, access and learning styles" (p.179).

Whether flexible learning is a teaching and learning approach, a philosophy, a teaching strategy, a value principle, a concept, a paradigm shift, or a delivery mode and despite its various definitions, there is one common underlying thread: it is a student-centered approach, which holds the learners' needs and preferences at focus in front of the decision-makers (Andrade & Alden-Rivers, 2019; Bryant et al., 2003; Gearhart, 2008; Goodyear, 2008; Li & Wong, 2018; Naidu, 2017; Soffer et al., 2019; Wanner & Palmer, 2015). Moreover, flexible learning satisfies the dissimilar needs of the students and offers them more control and responsibility in their learning (Goodyear, 2008; Soffer et al., 2019; Wanner & Palmer, 2015)

The term "flexible learning" is frequently used interchangeably when referring to "distance learning" (Li & Wong, 2018) and when referring to online, blended learning, or any educational setting that uses technology (Lynch, 2001). However, flexible learning is not just teaching using technology. Technology is only an enabling factor of flexible learning (Li & Wong, 2018). To Collis and Moonen (2012), flexible learning is not just distance education; it is broader "with the key idea being learner choice in different aspects of the learning experience" (p. 9). Jones and Walters (2015) emphasized that

technology is essential for students to succeed in the current economy and enables quality flexible learning and teaching approaches. The researchers stressed that "Technology-enhanced learning can mitigate the attendance requirements of full-time study, enabling students to learn in their own time and place and at their own pace" (Jones & Walters, 2015, p. 70).

Flexible learning is not limited to the time-space dimension but also involves the flexibility of other dimensions in the learning process. These include flexibility in the instructional approaches (Sadler-Smith & Smith, 2004), course content (Jones & Walters, 2015), assessment type (Wanner & Palmer, 2015), pace (Andrade & Alden-Rivers, 2019), delivery (Tucker & Morris, 2011), mode of study (Bevacqua & Colasante, 2019), and attendance mode (Beatty, 2007, October, 2014; Beatty, 2019).

The purpose of adopting flexible learning is to place the students at the center by allowing them to take control of their learning processes, which in turn promotes students' individuality (Benade, 2019), autonomy (Gencel, 2020), and self-regulation (Jones & Walters, 2015; Wanner & Palmer, 2015). This practice creates an environment appealing to socially motivated individuals who want to learn and achieve higher personal goals (Duarte et al., 2018; Guest, 2006; Liu & Rodriguez, 2019).

According to Wlodkowski (2003), flexibility should be shown both by the institution and the instructor. Beaudoin (2016) suggested that higher education should adopt strategies that enable institutions to be "more responsive and relevant to new demands from a clientele reflecting an evolving demographic profile" (p. 15). Providing a flexible learning environment is critical because most college students are nontraditional

students (Duarte et al., 2018). They have multiple commitments and responsibilities outside of school and have limited time to spend on school (Goncalves & Trunk, 2014).

As suggested by Outram (2011), successful flexible learning offers students the choices of when, how, where, and what pace to learn. For this to happen, instructors should be prepared to relinquish traditional control over students. For example, instructors should be welcoming their students as partners in creating a successful learning experience. Instructors should design their courses to allow flexible learning to be inserted in all daily activities of the learning experience (p. 9). Fortunately, advancements in educational technologies have facilitated such flexibility in the learning process (Jones & Walters, 2015; Palaoag et al., 2020; Wolverton, 2018).

Blended and fully online courses are two standard modes covered by the flexible learning umbrella (Kanchana, 2016; Oliver & Stallings, 2014; Tucker & Morris, 2011). The development of web conferencing systems provides new opportunities to make higher education more flexible and student-centered. It eliminates mandatory physical attendance and enables the flexibility of attending class sessions anywhere. Students can access content from their preferred locations at a time of their choice and can review the materials at their own pace (Jones & Walters, 2015). It also allows the participation of remote students in virtual face-to-face interaction and face-to-face class activities and discussions. These systems offer a variety of real-time communication channels such as video, audio, chat rooms, digital posting-boards, and live presentations (Day & Verhaart, 2016).

Nontraditional students prefer flexible learning environments because they have other responsibilities besides studying (Malone, 2019; Ross-Gordon, 2011). Therefore,

offering them flexible educational experiences is vital for their success. Palaoag et al. (2020) stressed that "flexibility in terms of time, space, method, strategy, resources, media, and learning material became the most important key for their learning success" (p.179).

According to Monteagudo and Ballesteros-Moscosio (2011), nontraditional students appreciate the flexibility of learning processes and course attendance. They also value instructors who understand their needs and offer them a diversity of tools and ways of assessment. Students are in control of their learning (Andrade & Alden-Rivers, 2019; Buß, 2019; Cassidy et al., 2016), and instructors should create innovative learning experiences that accommodate the students' different learning styles and energize the students to further engage with the course content (Gencel, 2020; Palaoag et al., 2020).

Demands for flexibility in learning have increasingly attracted higher education institutions' attention since the 1970s, as evidenced by the large volume of publications addressing this topic (Andrade & Alden-Rivers, 2019; Barak & Levenberg, 2016; Beaudoin, 2016; Li & Wong, 2018). Such increasing demands were mainly fueled in the last two decades due to the rapid progress achieved in information and communication technologies and their resulting applications in the education field (Li & Wong, 2018). This demand has become more forceful because of the changes in the students' demographics and job market requirements (Andrade & Alden-Rivers, 2019).

However, one should not be neglectful of the possible challenges for many students to access such technologies. These include technological skills challenges and financial inability to obtain the necessary digital devices and the required support systems (e.g., internet, peripherals) (Jones & Walters, 2015; Lakhal et al., 2017). Addressing such

challenges should not be neglected when designing the learning activities in flexible

learning courses. It is crucial that instructors fully understand that stimulating students'

autonomy requires the instructor's guidance and the institution's support (Jones &

Walters, 2015). However, students need to know that the advantages of flexible learning

come with new responsibilities. Students need to be more capable of self-motivating,

self-regulating, self-monitoring, goal setting, and self-correcting when needed (Bergamin

& Hirt, 2018; Bergamin et al., 2012; Soffer et al., 2019; Wanner & Palmer, 2015).

Delivery Modalities

The last two decades have witnessed a measurable increase in new course

delivery modalities. Ross and Anderson (2013) defined a course delivery modality as

"the mode of participating" (p. 138) in a course. Lee and Im (2014) stated that the quality

of education is related to the teaching modalities and learning environments offered in

any higher education institute. Lakhal and Meyer (2019) argued that course delivery

mode is concerning "decisions about the manner of presenting the content and teaching,

learning, and assessment activities designed into the course" (p. 2).

Higher education institutions started offering classes in many formats for a variety

of reasons. These reasons include accommodating students' needs (Allen et al., 2016;

Capp, 2017; Harrington, 2010), increasing enrollment (Wiles, 2017), improving retention

(Acosta et al., 2016), and decreasing educational cost (Lakhal & Meyer, 2019). Also,

many studies (Abou Naaj et al., 2012; Carmel & Gold, 2007; Fortin et al., 2016; Ryan &

Poole, 2019; Yawson & Yamoah, 2020) have revealed that students' satisfaction with the

teaching modality influences students' learning outcomes. The appeal of offering various

teaching modalities was further encouraged by the development of new technologies that

provided dependable learning online platforms and tools for educational purposes (Soffer & Nachmias, 2018).

Allen et al. (2016) presented an analogy for the various delivery modalities. They suggested that these modalities form a continuum. Face-to-face learning is on one end, and fully online learning is on the opposite end. They explained that even face-to-face learning could encompass some web-enhancements and information computer technology (ICT) if used only to support face-to-face activities. For example, an instructor can use a learning management system (LMS) to give students access to syllabi and assignments. As such, they stated that 1-29% of a face-to-face course could be delivered online.

In contrast, 80% or more of the learning activities should be delivered remotely to classify a course as online. In the online mode, students perform synchronously or asynchronously their activities utilizing the available LMS and ICT tools. Blended learning falls in the middle of the continuum; since it combines both the face-to-face and online modes. According to this continuum, Allen et al. (2016) suggested that blended learning should perform 30-79% of the teaching activities utilizing the available LMS and ICT tools. Nonetheless, these percentages are merely suggestions. They are subjective and can change based on the researcher, institution, education level, learning context, and the instructor's preference (Lakhal & Meyer, 2019).

Blended Learning

Blended learning is a teaching modality that combines features of face-to-face (F2F) teaching with online teaching. However, there is no single definition for blended learning that is agreed upon among educational researchers (Lakhal & Meyer, 2019; Liu

et al., 2016). A literature review confirms that this term means different things to different researchers, as shown below.

Graham (2006) defined blended learning as systems that "combine face-to-face instruction with computer-mediated instruction" (p. 5), while Garrison and Kanuka (2004) explained blended learning as "thoughtful integration of classroom face-to-face learning experiences with online learning experiences" (p. 96). Picciano (2019) described blended learning as the integration of media technologies into traditional teaching methods. Allen and Seaman (2010) defined blended learning as a "Course that blends online and face-to-face delivery. A substantial proportion of the content is delivered online, typically uses online discussions, and typically has a reduced number of face-to-face meetings" (p. 5). They added that in blended courses "between 30 percent and 80 percent of the course content delivered online" (p. 5). Holden et al. (2010) suggested that blended learning "is more than just combining an online component to the traditional classroom…it is a systematic process of selecting the most appropriate media for a specific learning intervention based upon the learning objectives." (p. 29). These definitions suggest that the combination should be thoughtful and systematic by selecting the appropriate media to achieve the learning objectives.

Blended learning was also defined as a "combination of characteristics from both traditional learning and blended e-learning environments. It merges aspects of blended e-learning, such as web-based instructions, streaming video, audio, synchronous and asynchronous communication, etc. with traditional 'face-to face' learning" (Widiara and Life, 2018 as cited in Nababan et al., 2019, p. 2). Hrastinski (2019) suggested that blended learning could be considered as an umbrella term that covers all teaching

approaches that combine F2F sessions with technology-enhanced learning environments. Similarly, Glantz and Gamrat (2020) described blended learning as the learning environment that utilizes available technology to enhance course activities, course contents, and course assessments in various delivery modalities.

Also, many researchers use the term "blended" and "hybrid" interchangeably (Allen & Seaman, 2010; Gleason & Greenhow, 2017; Raes et al., 2020; Tseng & Walsh Jr, 2016). Olapiriyakul and Scher (2006) suggested that these two terms "are used alternatively but refer to the same concept" (p. 288). In other words, these two terms are synonymous and could be used equivalently.

In 2012, McGee and Reis (2012) performed a meta-analysis of publications regarding "blended" and "hybrid" courses. They reported that no consensus exists on the definition of this term, and therefore they made suggestions related to the two terms. They tried to differentiate the two terms by examining the common use of the term "hybrid." This word describes multiple systems that work independently to offer a function" (e.g., hybrid cars). It is widely accepted that the term hybrid means that more than one system/function is used, but when one system/mode is used (e.g., electric motor), the other (e.g., gas motor) is unused/stopped. To differentiate between the two terms (i.e., blended and hybrid), they argued that blended might suggest no apparent switching when modes shift. Thus, blended courses are claimed to operate seamlessly when shifting between F2F sessions and online activities (p. 8).

Dziuban et al. (2018) suggested that blended learning is a happy medium between a fully online (distance education) and purely F2F teaching. However, examining the necessary degree of mixing these two modalities to qualify as blended learning shows

disagreements among researchers. Allen et al. (2016) reported that 30-79% of the learning should utilize web-based ICT in blended learning environments.

In addition, the evolution of this modality through the years resulted in the creation of many variations of blended learning (Lakhal & Meyer, 2019). These variations include the following: a) Blended Synchronous Learning – this modality mixes F2F with both synchronous and asynchronous online learning, and in which distant students participate using web-based connections to participate in the F2F sessions; b) Flipped Classroom – this modality combines F2F learning with asynchronous computer-aided mode, and in which the asynchronous activities are dedicated to self-directed contents or readings and the F2F activities follow active learning techniques; c) Synchromodal Learning – this modality is characterized by the interaction of the F2F students with the online students during specified synchronous sessions; d) Multiaccess Learning – this modality puts the students in control of their mode of participation in which they chose to attend in traditional F2F, a distant small group utilizing conferencing technology, individually utilizing conferencing technology, or totally online asynchronously; e) Hybrid and Flexible (HyFlex) –this modality places the students in total control of the mode of participation: F2F, distant, or keep switching their participation mode according to changes in their schedules, needs, and availability. The following section elaborates more on the HyFlex modality.

HyFlex Model

The Hybrid-flexible (HyFlex) is an innovative delivery mode designed to enable "a flexible participation policy for students, whereby students may choose to attend face-to-face synchronous class sessions in-person (typically in a traditional classroom) or

complete course learning activities online without physically attending class" (Beatty, 2019, p. 62). The term "HyFlex" contains the roots of two words: "Hybrid and "Flexible" (Kyei-Blankson & Godwyll, 2010), where "Hy" stands for hybrid, which is "a mix of face to face and online activities" (Beatty, 2007, October); and "Flex" for flexible where "students can choose their method of participation…..weekly" (Beatty, 2007, October).

The term "HyFlex" was coined by Dr. Brian Beatty, who pioneered this delivery modality in San Francisco State University (Beatty, 2007, October, 2014; Beatty, 2019). The HyFlex modality allows students to attend each class session in the mode that fits their circumstances, schedules, needs, individual commitments, and personal preferences. Students can attend face-to-face or online synchronously through video conferencing platforms or online asynchronously through the learning management system to watch the class recording and complete required assignments. (Beatty, 2007, October, 2014; Beatty, 2019).

The HyFlex model was developed for the Instructional Technologies (ITEC) Graduate Program at San Francisco State University to mitigate the declining enrollment in the master's program (Beatty, 2007, October; Beatty, 2019). This model's design took into consideration the university's location, history, enrollment trends, faculty capabilities, students' technical abilities, resource/time limitations, and existing challenges (Beatty, 2019). In the search for the appropriate learning modality to address the declining enrolment, it became apparent that the solution could be an option that simultaneously offers the online format to regional students and the classroom format to students who prefer the traditional classroom format. This format does not lock a student to a preset modality and allows each student to decide the best attendance/participation

format for his/her situation on a class-session by class-session basis. This exercise gave birth to the HyFlex (hybrid and flexible) modality (Beatty, 2019).

HyFlex Framework

The HyFlex model integrates three concepts: andragogy, student-centeredness, and flexible learning (Abdelmalak & Parra, 2018; Kyei-Blankson et al., 2014; Nur-Awaleh & Kyei-Blankson; Rhoads, 2020). Hill (2006) emphasized that in a student-centered environment, learners "are empowered to make their own decisions" (p. 190). Accordingly, students in HyFlex classes control where, when, and how the learning experience takes place (Beatty, 2019). The students select the participation mode (Abdelmalak & Parra, 2016; Colasante et al., 2020) and the teaching and learning method best suitable for them (Bevacqua & Colasante, 2019). Furthermore, this mode of teaching aligns with the andragogical principles of self-direction and autonomy. The students make these decisions according to their preferences, availability, personal/social commitments, and learning style (Kyei-Blankson et al., 2014).

To provide students with an effective HyFlex learning experience, Beatty (2007, October) emphasized that four principles must be considered when designing HyFlex courses: Learner Choice, Equivalency, Reusability, and Accessibility (Beatty, 2007, 2014, 2019).

Learner choice. To apply this principle, the course instructor should "Provide meaningful alternative participation modes and enable students to choose between participation modes weekly or (topically)" (Beatty, 2007, October, p. 17). In a HyFlex course, students are in control of how to participate in the course based on their "convenience, learning progress, social interaction, preferences, or other factors

important to them at the time." (Beatty, 2019, p. 83). They could attend any class session in-person, synchronously online, or watch the recorded session at a later time. This practice gives the students more autonomy and makes them more responsible for their learning outcomes (Outram, 2011). In addition, providing students with choices in learning can increase their intrinsic motivation and overall performance (Patall et al., 2008). Miller et al. (2013) recommended that instructors show no bias against the mode of attendance students select to attend class.

HyFlex modality supports a "less-centered" instructor's stance (Beatty, 2019, p. 105). It provides students with multiple options by offering choices in a) attending the course, b) interacting with its contents, and c) completing its activities (Beatty, 2019). Malczyk (2019) stated that providing students with such control is essential to offering the "flex" portion of the model (p. 416). Similarly, Beatty (2019) advocated that without providing students with these choices, "there is no flexibility … and therefore no HyFlex" (p. 56).

These statements corroborated with the study findings of Abdelmalak (2014), in which students enrolled in a HyFlex course were interviewed. The author noted that 30% reported that having such choices was critical to their motivation and engagement in the course activities. Ryan and Deci (2000) reported that when students are given choices, they develop a sense of ownership and cultivate a stronger sense of intrinsic motivation. HyFlex offers the students enough choices to allow them to customize blended learning to their needs and to enable them to effectively face their shifting constraints such as changes in work schedules, challenges in family situations, sudden illnesses, and similar unscheduled challenges (Koskinen, 2018; Malczyk, 2019).

Equivalency. To apply this principle, the instructor must provide "learning activities in all participation modes which lead to equivalent learning outcomes" (Beatty, 2019, p. 55). The course activities must be designed to allow all students to receive equivalent benefits from the learning experience independent of their attending choices (i.e., online, face-to-face, or a combination of both) (Beatty, 2007, October, 2014; Beatty, 2019).

In designing a HyFlex course, Beatty (2019) recommended that instructors should follow a "good instructional design practice and a thorough systematic process" (p. 63) in order to create adequate learning opportunities for all students. He maintained that this could be achieved by utilizing online resources/tools that allow unlimited viewing of course contents and ensuring easy access to students with various learning styles and language levels (Beatty, 2019). Moreover, Beatty emphasized in a podcast interview with ThinkUDL that using different media and activities may further engage students, assist the learning experience, and help all students to achieve learning outcomes (Nave, 2020, May 26). Beatty added in his podcast that in the HyFlex model, outcomes are based on a well-designed process (e.g., participating in discussions, demonstrating learning) rather than being forced on the students (Nave, 2020, May 26). In other words, the various choices in contents, engagement activities, and assessment methods should lead to equivalent learning for all students regardless of their preferences and learning styles.

Miller et al. (2013) conducted a study that involved 161 undergraduate students enrolled in a HyFlex course. The researchers examined the student performance and compared them with a control group of 168 students enrolled in traditional F2F sections of the same course offered in the same semester. The data was collected through a self-

reported attendance procedure, students' final grades, end-of-semester course survey, and focus groups. When the students' homework, examinations, final grades, and overall performance were analyzed, the analysis showed no statistically significant difference between the two student groups (i.e., HyFlex and F2F).

It is essential that students who are attending a HyFlex course remotely to have the opportunity to engage in real-time with the students attending in person and to engage with the instructor (Beatty, 2007, October, 2014; Beatty, 2019; Miller & Baham, 2018). A well-designed HyFlex course may require a total redesign of contents to offer the online students an experience equivalent to that provided for the F2F students (Wright, 2016). Instructors must be aware that a course design that leads to a negative learning experience for a particular group of students is unacceptable (Beatty, 2007, October; Beatty, 2019). According to Beatty, this kind of practice is "poor instructional practice and probably unethical" (Beatty, 2019, p. 56).

Reusability. Borba et al. (2016) defined reusability as the utilization of learning objects in multiple learning environments. Wiley (2002) described learning objects as "small (relative to the size of an entire course) instructional components that can be reused a number of times in different learning contexts" (p. 3). For Wiley (2002), learning objects are "any digital resource that can be reused to support learning" (p. 6). Similarly, Vercoustre and McLean (2005) defined learning objects as "any resource or content object that is supplied to a learner by a provider with the intention of meeting the learner's learning objective(s) and is used by the learner to meet that learning objective(s)" (p. 60). Generally, a learning object can be anything created by either

students or the instructor with an educational purpose and can be reused for different reasons and contexts.

To apply this principle, Beatty (2019) emphasized that the instructor must utilize "artifacts from learning activities in each participation mode as learning objects for all students" (p. 55). Moreover, Malczyk (2019) suggested that resources created for in-class students should also be useful and available for online students and vice-versa. When students complete activities in-class or online, the artifacts created should become potential learning objects for all students (Nave, 2020, May 26; Yassine et al., 2016).

Typically, in-class activities may include PowerPoint presentations, discussions boards, handouts, video recordings, podcasts, and other forms of communication. Such in-class activities should be accessible for both distant and on-campus students to review after the class session. Likewise, distant students should share their online activities, including electronic postings, asynchronous discussions, chats (Beatty, 2019; Miller et al., 2013).

Abdelmalak and Parra (2016) recorded class sessions, and the recordings were made available to all students. Distant or on-campus students who missed a session were allowed to view the recording. Additionally, students who needed extra reviews (e.g., English as a Second Language students) had the opportunity to review the recordings as many times as they desired to reach the level of skills necessary to succeed. Guides, tutorials, and rubrics were also made accessible on the LMS to enforce the reusability concept. Their study confirmed that being able to attend face-to-face sessions, access the class online if needed, and watch the class recordings increased the students' access to the course content and simplified their learning experience (Abdelmalak & Parra, 2016).

Accessibility. To apply this principle, Beatty (2019) recommended that the instructor should "equip students with technology skills and equitable access to all participation modes" (p. 55). When designing a HyFlex course, the instructional designer/instructors should ensure that alternative participation modes are accessible to all students. For example, viable access alternatives must be incorporated in the course to serve the students who cannot attend a class session. Similarly, the course should be designed with feasible alternatives for those who do not have internet access.

A well-designed HyFlex course ensures that students are equipped with technological tools (i.e., hardware, software, networks) and the technological skills necessary for accessing the course contents in the mode they chose (Beatty, 2014; Beatty, 2019). Although today's students are generally more comfortable with technology than past generations, many still show unease with the LMS and other web-based tools (Abdous, 2019; Eastman et al., 2017). Therefore, technology orientations and overviews of navigating and using an LMS are needed prior to taking web-based courses (Yoo & Huang, 2013). Another subtle example of increased accessibility is that closed captioning should accompany all audio or video recordings. Webpages and screen designs should be reader-friendly and satisfy the universal design guidelines for accessibility (Beatty, 2019). As more nontraditional students join higher education institutes, such institutions will face more regulatory and legal requirements (Beatty, 2019; Gobeil-Proulx, 2019).

HyFlex Impact on Students

Miller et al. (2013) conducted an experiment involving undergraduate students enrolled in a statistics course offered in the HyFlex modality. The researchers examined 161 students' performance and compared it to a control group of 168 students enrolled in

the same course taught face-to-face during the same semester. Both courses were offered with weekly sessions: three 48-minute lectures and two 48-minute recitations. The Hyflex course allowed students to attend the lecture sessions in various modes: in person, synchronously online, and in a combination of the two modalities. The recitations and examinations were held in person, on-campus. Both courses (HyFlex and traditional) had the same professor, curriculum, assignments, and examinations.

The data collected included self-reported attendance, final grades, an end-of-semester survey, and focus groups. No statistically significant difference was found between the HyFlex and traditional courses in the students' learning and performance. The study also revealed that 95% of the students in the Hyflex course expressed that they valued the learning options they were offered and the instructional technology support provided. However, 5% of the students preferred F2F lectures with little or no instructional technology. The data also showed that 38% of the students preferred purely online lectures, and 57% valued the availability of the different learning opportunities (Miller et al., 2013).

Abdelmalak (2014) conducted a qualitative study that examined the satisfaction of six doctoral students taking an educational technology course offered in the HyFlex modality. The course offered the students the choice of attending the course online, F2F, or in a combination of both. All the students had the same learning objectives, assignments, and coursework expectations. The researcher collected data through interviews, direct observations, recordings, and student coursework. The data analysis revealed that the HyFlex course gave the students more control of their own learning and

offered flexibility to accommodate their attendance needs. The study also revealed that students felt they could learn according to their learning styles and their schedules.

Lakhal et al. (2014) conducted a quantitative study involving 439 students enrolled in a 10-week HyFlex undergraduate management information systems course. The study's objective was to determine the effectiveness of HyFlex courses in terms of student satisfaction and academic performance. The researchers compared the satisfaction to the learning/performance of the students that fell in the following four attendance groups: 100% F2F, 100% synchronous online, 100% asynchronous online, and mixed modality attendance. All students were given free choices of their mode of attendance. The researchers measured the academic performance by the student scores on a multiple-choice test, a written exam, and other course assignments. The students' satisfaction was assessed by a survey that contained 20 items rated on a Likert-type scale (0 = strongly disagree; 7 = strongly agree). One-way ANOVA tests were performed on the answers to the satisfaction survey, exam results, and assignments scores. The results revealed only one statistically significant difference between the modalities in both satisfaction and performance. The satisfaction and performance were significantly higher for the students who attended the course synchronously than those who attended the course 100% asynchronously.

Kyei-Blankson et al. (2014) conducted a mixed methods study to determine the students' attendance choices, their learning experiences, and their level of satisfaction in a HyFlex course. The participants were 22 secondary school teachers attending a 10-week HyFlex course. The study attempted to explore the factors that students consider when deciding to combine online and F2F activities, the students' perception/description

of the HyFlex environment, and the students' level of student satisfaction with their learning experience in the HyFlex environment. An online survey was used to collect the quantitative data, and structured interviews were used to collect the qualitative data. The study findings showed that the students' choices of the mode of attendance were influenced by flexibility, weather conditions, and convenience. It also showed that 71% of the students appreciated the freedom to choose their mode of attendance on a class-by-class basis. Over 85% of the students indicated that they would enroll in similar courses because of the flexibility of the participation policy. The students also noted that both the F2F and online delivery formats met their learning needs and expectations equally. They reported that their choices of the attendance mode did not hinder their performance in the course and that they had equally meaningful learning in both the online and traditional environments. Specifically, 95% of the students reported high levels of satisfaction, 71% showed a high level of satisfaction in both learning in both environments. However, 29% of the students indicated that the online environment was the most satisfactory.

Wright (2016) conducted a quantitative study to analyze the outcomes of a HyFlex course he taught at Valdosta State University. His study explored the level of satisfaction of his students with their interaction in his HyFlex course. The researcher explored how students perceived their learning experiences quality and assessed their connection to the learning community. The study involved 186 undergraduate and graduate students enrolled in nine Adult and Career Education courses (ACED) over two consecutive years. The study findings suggested that 95% of the students agreed that they learned as much as expected in the HyFlex course, 94% felt connected to their peers, and 96% felt connected to the instructor.

Gobeil-Proulx (2019), a professor at a Canadian French-speaking university, examined the students' perspective regarding their experience with the "comodal teaching format" (another name for HyFlex). The study addressed students enrolled in nine comodal/HyFlex courses offered in four different colleges. The students were 95% undergraduates, and 5% were graduates. The objective was to explore the factors influencing the students' decisions to take a comodal/HyFlex course. The data was collected using a questionnaire that contained rating-scale questions and two open-ended questions. The findings revealed that the comodal/HyFlex format was highly appreciated, and 95% of the students felt satisfied with the comodal/HyFlex format. The students favored the remote (online) mode over the F2F mode. Interestingly, 60% indicated that they planned on not attending classes in person in the future, despite the occasional technical difficulties with online technology. It is also noteworthy that 28% of the students attended the course only in one of the two modes (F2F or online) although they were allowed to mix the attendance mode as they desired.

Rhoads (2020) conducted a mixed-methods investigation to determine the effect of the delivery modalities on students learning and satisfaction. The experiment involved 16-week traditional face-to-face courses and 5-week HyFlex courses. Both were undergraduate courses offered at a small private college in Southern California. Quantitative data was collected using students' final grades and survey Likert scale questions. Qualitative data was collected using open-ended survey questions and interviews. The participants were 81 undergraduate students enrolled in 15 undergraduate courses, offered in the traditional and non-traditional programs at a small private college. The results showed that students highly valued clear directions, defined expectations, and

a well-organized learning environment. They praised the presence of all these attributes in the HyFlex modality over the traditional modality. One could argue that the less F2F interaction between students and instructors in online/hybrid courses necessitates more explicit written directions and expectations. The qualitative analysis also revealed that the students learned better and became more satisfied because they were given choices regarding the class schedule and learning style. They objected to courses offered without options or students' input. It was interesting to discover that many students would favor the traditional classroom environment if they had no schedule conflicts. The results also suggested that students did not favor the five-week accelerated courses of both online and HyFlex while enrolled in traditional 16-week courses.

Summary

The topics described in this literature review chapter are interconnected and specifically relevant to the primary research topic: HyFlex modality. The previous studies presented in this chapter examined blended modalities, which led to the creation of the HyFlex format. Historically, higher education has enforced the traditional approach to teaching and learning (F2F, classroom sessions). Online education has only recently started to defy traditional teaching. The studies presented in this chapter suggest that there appears to be measurable benefits to deviating from the traditional face-to-face teaching approach. However, these studies also indicate that no one delivery mode fits all. They show that the new learning modalities came with challenges, necessitated the establishment of new standards/procedures, and placed new demands on the instructors and students. The studies also suggest that learning could be viewed as a continuum where 100% face-to-face teaching is placed on one end of the scale, and 100% online is

on the opposite end. Many modalities should be considered between these two ends when choosing the learning environment most appropriate for a specific group of learners. Indeed, the previous studies confirm the advantages of combining the two opposite modalities (100% F2F and 100% online). Such combination improves the learning environment and boosts the learners' performance and satisfaction. This researcher believes that the HyFlex modality offers the most balanced environment that combines the advantages of the two opposite modalities. This study adds to the studies that examined the impact of the HyFlex modality on students' satisfaction and their perceptions of learning in such a flexible environment. In addition, the present study provides information on the factors that positively influence all learners' satisfaction and perceived learning, but specifically benefits the nontraditional students. The ultimate flexibility provided by the HyFlex methodology regarding the choice of the mode of class attendance given to the students on a session-by-session basis was examined to determine its impact on the learners' satisfaction and perceived learning. Chapter Three provides an overview of the study design and the methodology adopted to investigate the research problem.

CHAPTER III

Methodology

Chapter 3 presents the research design and methodology for this study. It starts

with a review of the study purpose and research questions. Then, a description of the

mixed methods research design and its rationale for this study is discussed. Next, a

description of the research site, participants, and the instrument is presented. After that,

the quantitative and qualitative data collection procedures are provided. Then the role of

the researcher and the validity and reliability of this study are discussed. This chapter

concludes with a summary.

Study Purpose, Research Questions, and Hypotheses

The purpose of this study was to investigate the effect of the HyFlex modality and

its attendance flexibility policy on the students' satisfaction and perceived learning.

Specifically, the study focused on exploring whether the satisfaction and perception of

the nontraditional students varied from the traditional students. The following six

research questions (RQs) guided this study:

RQ1: How do students perceive their overall satisfaction with the HyFlex

courses?

RQ2. Is there a statistically significant difference between Nontraditional

students' and traditional students' overall satisfaction with the HyFlex

modality?

RQ3. Is there a correlation between students' overall satisfaction and the six

subscales of "HyFlex Content and Delivery"?

RQ4: How do students perceive the impact of the HyFlex modality on their

learning?

RQ5. To what extent, if any, is there a statistically significant difference between
how nontraditional and traditional students perceive the impact of the
HyFlex modality on their learning?

RQ6. How does perceived learning relate to students' intention to enroll in
HyFlex classes in the future?

RQ1 and RQ4 were descriptive in nature, and therefore they did not require
hypotheses testing. RQ2, RQ3, RQ5, and RQ6 used inferential statistics to test the
following hypotheses:

*H*2o: There is no significant difference in the overall satisfaction with HyFlex
classes between traditional and nontraditional students.

*H*2a: There is a significant difference in the overall satisfaction with HyFlex
classes between traditional and nontraditional students.

*H*3o: There is no significant statistical correlation between students' overall
satisfaction and the six subscales of "HyFlex Content and Delivery."

*H*3a: There is a significant statistical correlation between students' overall
satisfaction and the six subscales of "HyFlex Content and Delivery."

*H*5o: There is no significant difference between the perception of traditional and
nontraditional students regarding the impact of the HyFlex modality on their
learning.

*H*5a: There is a significant difference between the perception of traditional and
nontraditional students regarding the impact of the HyFlex modality on their
learning.

*H*6o: There is no significant statistical correlation between the perceived impact of HyFlex modality on students' learning and intention to enroll in HyFlex classes in the future.

*H*6a: There is a significant statistical correlation between the perceived impact of HyFlex modality on students' learning and intention to enroll in HyFlex classes in the future.

Research Design

This study used a mixed-methods approach to investigate quantitavely and qualitatively students' satisfaction with HyFlex classes and their perceived impact on their learning. Johnson and Onwuegbuzie (2004) defined mixed-methods design "as the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (p. 17). Creswell (2014) posited that mixed methods is an:

> Approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone. (p. 4)

Creswell and Plano Clark (2017) definition for mixed methods research provides guiding philosophical assumptions to mix the quantitative and qualitative approaches properly. They stated that:

Mixed methods is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative approaches in many phases in the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone. (Creswell & Plano Clark, 2017, p. 5)

The researcher opted to use the mixed methods design in this study because quantitative or qualitative methods alone are insufficient to uncover all the details of the subject under investigation. This is especially true when addressing issues such as students' perceptions of a learning modality and the reasons for their satisfaction. By coupling quantitative and qualitative methods, the study gains from the strength and benefits of each method and the more in-depth analysis (Creswell & Plano Clark, 2017; Tashakkori & Teddlie, 1998).

Muijs (2010) suggested that quantitative methods are appropriate for collecting and analyzing numerical data, while qualitative methods are appropriate for collecting and analyzing text. Many investigators (Creswell, 2014; Tubey et al., 2015; Yilmaz, 2013) agreed that the quantitative methodology is focused on exploring variables that can steadily be observed/measured, while the qualitative methodology is focused on exploring the reasons beyond the information resulting from the quantitative methodology. The qualitative methodology emphasizes why the participants selected

specific answers or felt/acted in a certain way. Creswell (2014) explained that a mixed

methods design combines the benefits of quantitative data and qualitative data. In other

words, it combines the ability to generalize relationships and conclusions through the

quantitative methodology and understanding the detailed information through the

qualitative methodology.

Creswell and Plano Clark (2017) outlined three core designs that frame most

mixed methods research bases. These are: a) Explanatory Sequential Design, b)

Exploratory Sequential Design, and c) Convergent Design.

a) Explanatory Sequential Design - This design involves two phases. In the first

   phase, the researcher collects and analyzes quantitative data first. The

   quantitative findings inform the qualitative data collection and analysis during

   the second phase (Creswell & Plano Clark, 2017).

b) Exploratory Sequential Design – This design involves two phases as well. In

   the first phase, the researcher collects and analyzes qualitative data. The

   qualitative findings inform the quantitative data collection and analysis during

   the second phase (Creswell & Plano Clark, 2017).

c) Convergent Design – This design involves only one phase in which

   quantitative and qualitative data are collected simultaneously and analyzed

   independently then merged. (Creswell & Plano Clark, 2017). The convergent

   research design and its use in this study are discussed next.

Convergent Mixed Methods

The current study adopted the convergent mixed methods design. Creswell and

Plano Clark (2017) described this design as one that "involves collecting and analyzing

two independent strands of qualitative and quantitative data in a single phase, merging the results of the two strands, and then looking for convergence, divergence, contradictions, or relationships between the two databases." (p. 74). Converging quantitative data (utilizing students' Likert scale rating) with qualitative data (utilizing students' open-ended textual statements and reflections) allowed a comprehensive investigation of the students' perception and attitude toward the HyFlex modality.

According to Creswell and Plano Clark (2017), the convergent design has three variants:

1. Parallel Databases Variant - In this variant, the researcher collects and analyzes the quantitative and qualitative data independently and then integrates them at the interpretation stage (Creswell & Plano Clark, 2017).

2. Data Transformation Variant - In this variant, the researcher quantifies the qualitative data by converting it into numerical codes and then merging the two datasets (Creswell & Plano Clark, 2017).

3. Questionnaire Variant - In this variant, both the open and close-ended questions are included in a questionnaire, and "the results from the open-ended questions are used to confirm or validate the results from the closed-ended questions" (Creswell & Plano Clark, 2017, p. 74).

4. Fully Integrated Variant - In this variant, both qualitative and quantitative components interact together throughout the study instead of working separately and independently (Creswell & Plano Clark, 2017).

The study presented here utilized the questionnaire variant to administer a survey that included both open-ended and closed-ended questions to collect both data

simultaneously. Following the recommendations of Creswell and Plano Clark (2017), the "results from the open-ended questions" were used "to confirm or validate the results from the closed-ended questions" (p. 73). Creswell and Plano Clark (2017) previously named this variant "Data-validation" (p. 11) and considered it in earlier editions of their book "mixed methods light." They explained that even though this light model of mixed methods does not produce a rigorous qualitative data set, it does "provide the researcher with emergent themes and interesting quotes that can be used to validate and embellish the quantitative survey findings." (Creswell & Plano Clark, 2017, p. 73). Figure 1 below demonstrates the convergent mixed methods design used in this study.

Figure 1

Convergent Mixed Methods Research Design

The convergent design has several advantages, including ease of use, efficiency by concurrently collecting all data, analyzing each data set separately, and holistically understanding the data (Creswell & Plano Clark, 2017). Despite its advantages, Creswell and Plano Clark (2017) warn about three common challenges in using the convergent mixed methods design. First, if the two databases have different sample sizes, this will become challenging when merging the data. However, having different sample sizes is not problematic if the intent of combining the databases is to compare or combine the

results. Second, it is challenging to merge numerical and textual datasets. However, examining the same concepts will help reduce this issue. Third, it is challenging to handle the divergence in the data. In other words, the qualitative and quantitative data may contradict one another. Thus the researcher may have to find ways to explain such contradictions or collect more data to clarify the discrepancy (Creswell & Plano Clark, 2017).

Philosophical Views

Creswell (2014) introduced four philosophical views regarding the choice of a qualitative, quantitative, or mixed-methods design. These are 1) post-positivism, 2) constructivism, 3) transformative, and 4) pragmatism.

Post-Positivism. Post-positivism is a "deterministic philosophy in which causes determine effect or outcomes" (Creswell, 2014, p. 7). The Post-positivism paradigm challenges the notion of absolute truth and views that reality is objective and that all information can be quantified (Creswell, 2014). Accordingly, post-positivism is considered the "primary foundation and anchor for quantitative research" (Ponterotto, 2005, p. 129). The goal of post-positivist researchers is to find the truth about something through scientific methods (Willis et al., 2007).

Constructivism. Constructivism view emphasizes the role of the individuals and their ability to develop "meanings directed toward certain objects or things" (Creswell, 2014, p. 37). Furthermore, Creswell (2014) states that constructive researchers assert multiple subjective realities dependent on individual perspectives and adopt an inductive and curious approach to exploring the complexity of these converging realities.

Transformatism. Transformative researchers attempt to transform and improve the lives of the individuals participating in their research work. To engage in their research, transformative researchers often use quantitative and qualitative methods (Creswell, 2014). This view suggests that research methods are not suitable for marginalized individuals. It seeks to change by addressing important current social issues such as oppression, inequality, and empowerment (Creswell, 2014). This paradigm advocates that politics and political agendas should be related to the research questions if one intends to defy any level of social authority.

Pragmatism. Creswell and Plano Clark (2017) defined pragmatism as having a "focus on the consequences of research, of the primary importance of the question, asked rather than the methods, and on the use of multiple methods of data collection to inform the problems under study" (p. 41). In other words, pragmatist researchers focus on the research problem rather than the methods and are not devoted to one philosophy, reality, procedure, or technique. They seek whatever research method to address the research problem. In this way, they view truth as "what works at the time." (Creswell, 2014, p. 11). Pragmatists formulate their research content and methodology in accordance to the planned consequences. In other words, they are not biased to a particular data collection method, data analysis technique, set of assumptions, or predetermined view (Creswell, 2014).

Creswell (2014) stated that "Pragmatism is not committed to any one system of philosophy and reality...inquirers draw liberally from both quantitative and qualitative assumptions when they engage in research" (p. 11). Therefore, Creswell (2005) asserts that the mixed methods approach creates a pragmatic knowledge environment for

answering the question on hand. As a result, the quantitative and qualitative methods complement each other, and the integration of numerical and text data leads to a better understanding of the research problem (Creswell & Plano Clark, 2017).

The researcher of this study adopted a pragmatic stance using a questionnaire containing quantitative and qualitative questions to achieve the research objectives, gain practical knowledge on the subject matter and have a much broader perspective of the factors influencing the students' satisfaction/dissatisfaction with the HyFlex modality. It also allowed for a better picture of how students perceived their learning when given a flexible attendance mode. In addition, this approach allowed the researcher to triangulate responses collected from both closed and open-ended questions to enhance the validity of the research findings (Creswell & Plano Clark, 2017).

Research Setting

This study was conducted during the Covid 19 pandemic at a college of technology in a large university in the Southern United States. The college commonly offers its classes face-to-face, online synchronous, online asynchronous, and Hybrid. However, in response to the COVID-19 pandemic, the HyFlex modality was added to the class offerings. This decision was made to primarily accommodate the students who feared physical contact with others because of the pandemic and serve the students who preferred the in-person learning environment.

Since all classes had to be taught online or in HyFlex mode, the university launched a task force to prepare instructors to teach in these modalities. Several synchronous workshops were offered during the summer of 2020. These workshops were also recorded to allow the instructors to watch them afterward. Also, the task force

created a webpage with pedagogical and technical information to assist instructors in teaching and managing online and HyFlex classes. The university upgraded the technology of several classrooms to support the HyFlex modality as it requires simultaneously teaching face-to-face and online students and recording the lectures.

Research Site

This study was conducted during the spring semester of 2021 in a college that consists of four departments and serves over 6,000 students. Before the COVID pandemic, the college offered about half of its classes in face-to-face format and the other half online or in a hybrid format. During the spring 2021 semester, the college offered 340 undergraduate courses, of which only 18 were offered face-to-face. In addition, 213 were offered online synchronous, 81 online asynchronous, and 22 HyFlex.

This study focused only on the 22 undergraduate HyFlex classes offered by four different programs during the spring of 2021. These HyFlex classes allowed students to attend in three modes: Face-to-face, online synchronous, or online asynchronous. Students were free to choose their attendance mode based on their personal preferences and circumstances.

Students who chose to attend a class face-to-face were required to follow the Covid-19 guidelines and protocols enforced by the university (i.e., wearing masks and maintaining a 6-feet distance from others). Students who chose to attend the class session synchronously online used Microsoft Teams. Microsoft Teams is a video conferencing application and collaboration tool that allows the instructors to deliver their classes online while recording the session. Microsoft Teams also allowed online students to interact with the instructor and classmates using a microphone or a chat box during the class

session. When there was a group activity, online students were placed into MS Teams

breakout rooms to communicate and collaborate with their group members. Students who

choose to attend the session asynchronously could access the lecture recording of the

session and its related course material through Blackboard learning management system.

Study Participants

Participants in this study were all undergraduate students enrolled in HyFlex

classes during the spring of 2021. Upon receiving the approval of the Institutional

Review Board (IRB), a list of students' names and email addresses was obtained from the

instructors. An email describing the study and attaching the informed consent form and

the link to the online survey was sent to 222 undergraduate students. Participants were

informed that completing the survey was voluntary and that they could withdraw from

the study anytime. They were also advised to contact the researcher via email if they had

questions about the study. Also, participants were assured that their responses would be

confidential. The participants were at least 18 years old and of mixed genders, ethnicities,

academic levels, family status, enrollment status, and employment status.

Instrumentation

This study adopted and subsequently adapted a questionnaire designed for a study

conducted by Rhoads (2020). Rhoads' instrument was chosen because it was designed for

undergraduate students, and it was tested and validated. The instrument was designed by

a group of faculty members from a private liberal arts college in Southern California. It

contained 14 questions that were grouped under four categories (Demographic

Information, Content and Delivery Questions, Attendance Flexibility Questions, Overall

Comments). In his study, Rhoads (2020) compared 15 courses, each of which were taught

in two sections: one section in HyFlex mode and one section in traditional face-to-face mode. The focus of his study was comparing the students' answers from the face-to-face section with the answers from the HyFlex section, for each course. With the permission of the author, the survey instrument was modified to ensure that the research questions presented in this dissertation were fully addressed.

Revised Survey

Rhoads (2020) instrument was modified by removing and adding questions, changing the rating scale, and rephrasing some statements. The original survey contained four sections: 1) Demographic Information, 2) Content and Delivery Questions, 3) Attendance Flexibility Questions, and 4) Overall Comment (See Appendix B - Rhoads (2020) Original Survey). The following section discusses the modifications and describes the rationale behind each change.

Modifications to the Demographic Section

1. To protect the anonymity of the respondents, question 1 was removed from the original survey because it requested the participants to enter their names and email addresses.

2. To meet the purpose of the current study and to facilitate the separation of the responses of traditional students from those of nontraditional students, the researcher added six questions (See Appendix C - Modified Survey). These questions inquired about characteristics that can distinguish nontraditional students (e.g., employment status (Q5), family status (Q6), enrollment status (Q7), financial status (Q9), High school vs. GED (Q10), and college enrollment year (Q11).

3. Two questions were added to the demographic section of the questionnaire to attain information about the respondents' academic level (Q 8) and prior enrollment in HyFlex classes (Q12).

Modifications to the Content and Delivery Section

1. The "Content and Delivery Questions" section in the original survey was changed to "HyFlex Content and Delivery." This was done to better reflect the questions in that section.

2. Questions 5-11 of the original survey were rephrased since the current study focuses on students' (not the instructors') satisfaction with the HyFlex modality. (See Q 13-18 in Appendix C - Modified survey).

3. The answer choice "Not applicable, does not relate to the course, or you do not have an opinion" was removed from the answer choices of questions 5-11 in the original survey. This answer choice did not apply to the current study.

4. Question 7 in the original survey was removed since the current study does not assess the instructors' expertise and competencies.

5. A 6-point Likert agreement scale was used in the current study. It ranged from "Strongly Disagree" (1) to "Strongly Agree" (6). A neutral answer choice was eliminated to force participants to take a clear stand on the issue.

Modifications to the Attendance Flexibility Section

1. The "Attendance Flexibility Questions" section in the original survey was changed to "HyFlex Satisfaction and Perceived Learning." This was done to better reflect the questions in that section.

2. Two quantitative questions (Q19 and Q20) were added to triangulate the data obtained from the qualitative questions. Q19 asked the participants to rate their overall satisfaction with the HyFlex modality on the 6-point Likert scale that ranged from "extremely satisfied (1) to "extremely dissatisfied (6). Q20 asked the students to indicate how they perceive the impact of the HyFlex modality on their learning. A 6-point Likert scale that ranges from extremely positive impact (6 points) to extremely negative impact (1 point) was also used for this scaled question. Both questions had no neutral answer choices.

3. Question 21, "What is your intention to enroll in the future in HyFlex courses?" was added to directly address research question #6 (How does the perceived learning impact students' intention to enroll in HyFlex classes in the future?). A 5-point Likert scale was used for the answer choices for this question which ranged from "I will certainly Not enroll in a HyFlex course in the future" (1) to "I will certainly enroll in a HyFlex course in the future" (5).

4. The three open-ended questions 12-14 of the original survey were rephrased to make them clearer and more applicable to the current study.

New Section Added to the Survey

1. A new section was added to the survey to identify participants willing to participate in a follow-up interview. In this section, participants could indicate their willingness to a follow-up interview in exchange for a $25 Visa gift card as compensation for their time.

2. Willing participants were asked to enter their name, email, and phone number.

3. A total of 67 students expressed their interest in participating in a follow-up interview. However, follow-up interviews were not needed because the quality and high quantity of the open-ended responses received from the survey were sufficient.

Questionnaire Pilot Test and Results

Creswell (2014) advocated that pilot testing is recommended to "establish the content validity of scores on an instrument and to improve question, format, and scales" (p. 161). Once the survey modifications were completed, the researcher, academic advisors, and two instructors examined the survey instrument and confirmed its validity before pilot testing. Upon receiving the Institutional Review Boards' (IRB) approval, a pilot test was conducted in March 2021. This was done using a convenience sample of 10 undergraduate students enrolled in HyFlex classes at different colleges in the university. Participants were of different ages, genders, ethnicity, programs, and undergraduate academic levels. The students used in the pilot test were not part of the final study.

The pilot test was hosted in Qualtrics (Qualtrics, Provo, UT, 2021), an online survey platform available for use at no charge to graduate students and employees of the university where the researcher studied. The researcher contacted participants via email and informed them about the study purpose and the pilot test goal and procedure. The researcher encouraged the participants to comment on the clarity, logic, and format of the survey questions and report any errors or difficulties. The participants were also encouraged to make suggestions for improvement. The purpose of pilot testing was to confirm the instrument's validity and reliability and assess its clarity, relevance, acceptability, and completion time.

The participants reported that the questions were easily understood and did not experience any technical difficulties. According to Qualtrics generated report, it took the participants 6-8 minutes to complete the survey. Furthermore, to assess the internal consistency of the revised "HyFlex Content and Delivery" subscales, the researcher used SPSS to conduct a Cronbach's alpha. This section includes six scaled questions that are measured on 6 points Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (6). As seen in Table 1, the Cronbach's alpha was 0.88, indicating a high level of internal consistency among the six items.

Table 1

Cronbach's Alpha for the HyFlex Content and Delivery Subscales

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.888	.903	7

Data Collection Procedure

Before conducting the study, permission to use and modify the survey instrument was obtained from the original author, Dr. David D. Rhoads (Appendix D and E). Following the Institutional Review Boards' (IRB) approval (Appendix F) and upon completing the pilot test, the researcher contacted the instructors teaching the HyFlex course to explain the purpose of the research and request their assistance in obtaining their students' emails.

The survey was administered and collected digitally through Qualtrics online survey platform. The data collection took about four weeks. On March 22, 2021, the researcher sent the invitation email (see Appendix G) to 222 students to participate in the

study. The email included a brief explanation of the study, its purpose, the IRB-approved informed consent statement (see appendix H), and a link to the survey. As approved by the IRB, the instructors offered an incentive of five extra points to students who completed the survey.

Once students clicked on the survey link, they were directed to the Qualtrics survey webpage. They were then provided with the Informed Consent Form. The form had detailed information about the purpose of the study, its benefits, procedure, incentives, and the IRB approval. In addition, the form outlined the confidentiality of the results and stated that participation in the proposed study is voluntary, and participants may withdraw from it at any time. The form also included the contact information of the researcher and the supervising faculty member. According to IRB approavl, students earned five points extra credit as an incentive from their instructors to complete the survey. Students who consented to participate in the study were automatically directed to the online survey questions. The survey was accessible for about four weeks, from March 22 till April 22.

A total of 193 students attempted the survey, with 162 completing it. Out of 193 total attempts, 162 were considered usable (i.e., 73.3% response rate). This high response rate was attributed to extra credit incentives and the instructors' encouragement to students to complete the survey.

Quantitative Data Collection

Quantitative data was collected using the survey's closed-ended questions (Q13-21) (See Appendix C). Survey questions 13 to 18 allowed insight into how students perceive certain variables related to the content and delivery of HyFlex classes, while

questions 19-21 gave information on how students perceive their overall satisfaction with HyFlex courses, the impact of Hyflex on their learning and plans for future enrollment. Quantitative data collected was transferred into the IBM Statistical Package for the Social Sciences (SPSS v.27) for further analyses.

Qualitative Data Collection

Qualitative data was collected using the open-ended questions (Q22, 23, and 24) in the online survey (See Appendix C). Question 22 allowed insight into how students perceive the impact of the HyFlex modality on their learning. Question 23 gave knowledge of factors that led to students' satisfaction or dissatisfaction with HyFlex classes. Question 24 asked participants for any further comments or feedback regarding their experience with the HyFlex modality.

One hundred forty-two participants responded to the open-ended question 22, 140 students' responded to the open-ended question 23, and 102 participants provided additional feedback to question 24. Qualitative data collected was analyzed using the Text IQ tool offered by the Qualtrics platform.

Data Analyses Procedures

This convergent mixed-methods study obtained the data using a questionnaire that simultaneously collected quantitative and qualitative data. Quantitative data were analyzed using descriptive and inferential statistics, while qualitative data were analyzed using inductive thematic analysis. The following section describes quantitative and qualitative data analyses procedures.

Quantitative Data Analysis

The researcher transferred all data collected in Qualtrics to the IBM Statistical Package for the Social Sciences software (SPSS v.27) to conduct descriptive and inferential analyses and test the hypotheses. Using SPSS, the researcher first prepared and cleaned data. Second, the researcher created a traditionality binary variable to classify students as traditional or nontraditional. Lastly, the researcher carried out the statistical analyses.

The researcher prepared and cleaned the data by 1) identifying missing data, 2) removing empty/non-data rows, 3) omitting incomplete surveys (e.g., data from participants who did not answer the scaled questions related to the HyFlex modality (Q13-21), 3) checking for outliers, 4) labeling the variables, and 5) reversing the Likert scale answer choices so that a rating of 1 corresponds to a negative statement and a rating of 6 corresponds to a positive statement, and 6) testing data normality.

Once the data was cleaned, the researcher used demographic variables related to age, financial status, employment status, family status, high school diploma, and college enrollment year to construct a binary variable that classifies participants as traditional or nontraditional students. Traditional students were coded as (0) and nontraditional as (1). A detailed description of how the binary variable was constructed is discussed later in this chapter.

Once the data was prepared as described above, the researcher carried out the quantitative analysis using SPSS. The statistical analysis included descriptive statistics and inferential statistics. Descriptive statistics were used to analyze data regarding participants' demographics and data related to students' traditionality status. Also,

Descriptive statistics were used to answer research questions 1 and 4. Inferential statistics were used to answer research questions 2, 3, 5, and 6 and test their related hypotheses. Appendix A provides an overview of each research question, its data sources, and the statistical tests used to address it.

Descriptive Statistics

Descriptive statistics were used to examine the demographics of study participants and identify traditional and nontraditional students. Research questions 1 and 4 are descriptive in nature and therefore require descriptive statistical analysis. Data sources for research question 1 was survey item 19, and data sources for research question 4 was survey item 20 (see Appendix C). Results of the descriptive analysis are presented as frequencies, percentages, mean and standard deviations.

Inferential Statistics – Mann-Whitney U Test

Research questions 2 and 5 used inferential statistics to test the hypotheses ($H2o$, $H2a$, $H5o$, and $H5a$). The purpose of testing these hypotheses was to determine whether or not traditional and nontraditional students differ statistically in terms of their overall satisfaction with HyFlex classes and their perception of the impact of this modality on their learning. Survey question 19 provided the data for research question 2, and survey question 20 provided the data for research question 5 (see Appendix C).

The dependent variables of research questions 2 and 5 were measured at the ordinal level, and the data distribution for both questions was not normally distributed. Therefore the non-parametric Mann-Whitney U test at alpha .05 was used to determine whether there was a statistical significance the difference between traditional and nontraditional (Laerd Statistics, 2018b).

In order to carry out a Mann-Whitney U test, the following four assumptions must be met: 1) the dependent variable is measured at the ordinal or continuous level, 2) the independent variable consists of two categorical, independent groups, 3) there should be independence of observations, and 4) data is not normally distributed. However, the distribution pattern should follow the same shape for both independent variable groups (Laerd Statistics, 2018b). Assumptions one, two, and three were met by study design for both research questions 2 and 5. Assumption four was assessed using SPSS. A visual inspection of the histograms concluded that this assumption was met for both research questions (See Figure 2 and Figure 3)

Figure 2

Distribution Scores of overall satisfaction for traditional and nontraditional students
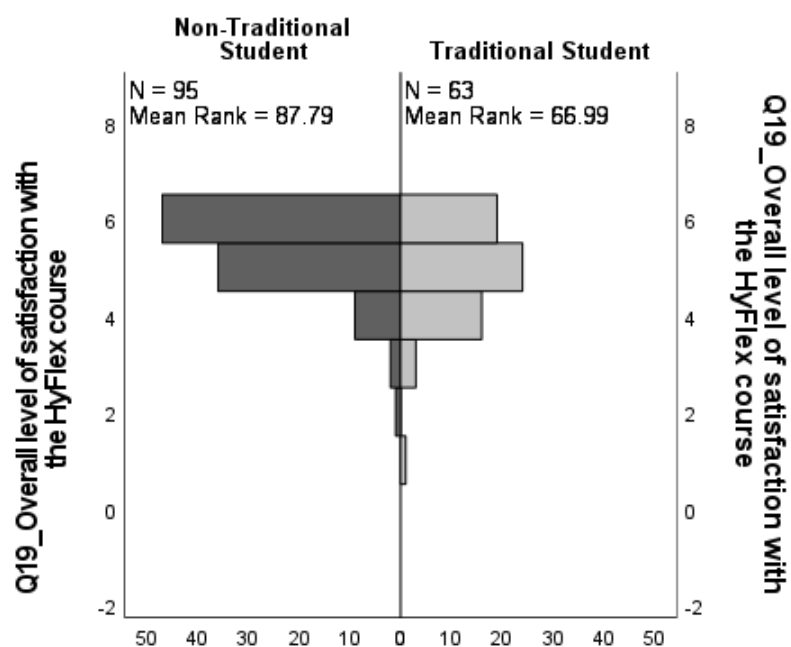
Figure 3

Distribution Scores of Impact on Learning for Traditional and Nontraditional Students
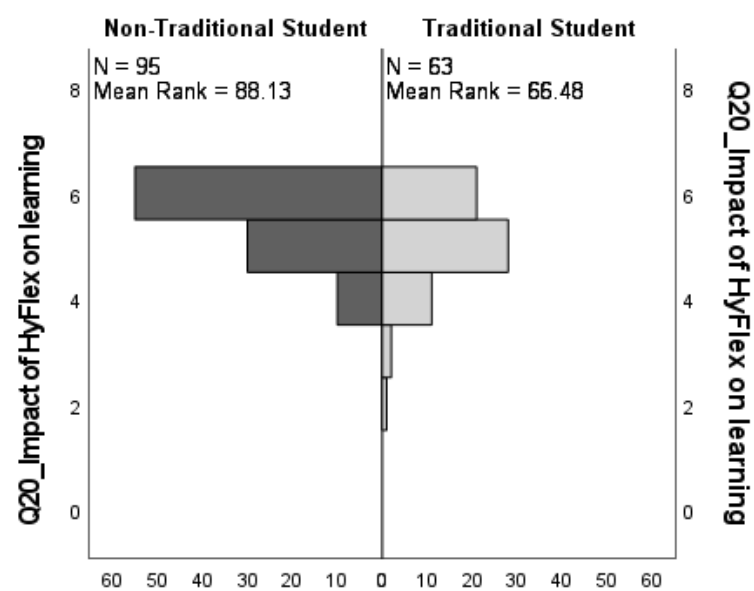
Inferential Statistics – Spearman's Rank Order Correlation Test

Research questions 3 and 6 used inferential statistics to test the hypotheses (*H*3o, *H*3a, *H*6o, and *H*6a). The general purpose of these research questions and testing these hypotheses was to determine correlations between certain variables.

Research question 3 tested hypotheses *H*3o and *H*3a and intended to determine a relationship between the HyFlex course content variables (Q13-Q18) and students' overall satisfaction (Q19). Data sources for research question 3 were answers to survey questions Q13-Q19 (see Appendix C). The section "HyFlex Content and Delivery" included items Q13-Q18 which asked participants to rate on a 6-points Likert scale their satisfaction with six statements related to: clarity of course requirement and expectations (Q13), being provided with sufficiently challenging assignments (Q14), the meaningfulness of learning activities (Q15), content organization (Q16), accommodation of attendance mode (Q17), and effective use of LMS (Q18) (See Appendix C).

Research question 6 tested Hypotheses *H*6o and *H*6a and intended to determine if students' perceived impact of HyFlex modality on their learning is associated with students' plans to enroll in HyFlex classes in the future. Data sources for research question 6 were survey items Q20 and Q21 (see Appendix C).

Since the variables in research questions 3 and 6 are measured at the ordinal level, the non-parametric Spearman's rank-order correlation test (i.e., Spearman's rho) was used. According to (Laerd Statistics, 2018c), Spearman's rank-order correlation test is the nonparametric version of the Pearson product-moment correlation. It is appropriate to use when either or both the independent and dependent variables are measured at the ordinal level of measurement or at interval levels that do not meet the assumption of normality.

Spearman's correlation test measures "the strength and direction of association that exists between two variables measured on at least an ordinal scale" (Laerd Statistics, 2018c). Spearman's correlations range from -1 and +1. A significant strong positive relationship is registered when the coefficient (r_s) is greater than +.50 or approaches +1. A significant strong negative correlation is registered when the coefficient (r_s) is less than -.50 or approach -1. A correlation coefficient r_s of zero or close to zero indicates no relationships between the variables (Laerd Statistics, 2018c).

Qualitative Data Analysis

As mentioned earlier in this chapter, research question 1 (How do students perceive their overall satisfaction with the HyFlex courses?) and research question 4 (How do students perceive the impact of HyFlex modality on their learning?) were addressed both quantitatively and qualitatively. To accomplish this, students were asked the following three open-ended questions in the survey (see appendix C):

1. "By giving you the choice to attend each class session in the mode of your preference, do you feel that you are learning more, less, or the same as in other teaching formats? Explain." (Q22);

2. "How does the flexibility in attendance affect your overall satisfaction with this course? Explain." (Q23); and

3. "Do you have more feedback about your experience with the HyFlex course format you would like to share?" (Q24).

The qualitative data for this study was collected via Qualtrics online survey and analyzed thematically with the aid of Text IQ tool offered by Qualtrics XM (Qualtrics, Provo, UT, 2021). The text IQ tool allows to tag 'topics' (i.e., codes) to each response.

Topics that share similar patterns or relate to each other can be moved within Qualtrics Text IQ to a "parent topic" (i.e., theme/subtheme/category). The researcher conducted a thematic analysis following Braun and Clarke (2006) six-phase model to code the data and find emerging themes.

Thematic Analysis Procedure

Due to the scarcity of literature on HyFlex classes, the researcher used the inductive thematic analysis approach to code the data and discover emerging themes that could shed light on the quantitative data. Inductive thematic analysis is a bottom-up, data-driven process in which a researcher codes the data "without trying to fit it into a preexisting coding frame, or the researcher's analytic preconceptions" (Braun & Clarke, 2006, p. 83).

In coding the collected qualitative data, the researcher followed the six steps suggested by Braun and Clarke (2006). These steps are: 1) familiarizing oneself with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing potential themes, 5) defining and naming themes, and 6) producing the report.

For the first step, the researcher immersed herself in the collected data by carefully reading the responses multiple times. She did this while "taking notes or marking ideas for coding" (Braun & Clarke, 2006, p. 87). The researcher read each response line by line during the second step and assigned initial codes to relevant words. During the third step, the researcher searched for themes by identifying similar/related patterns and codes. Those patterns and codes were then grouped into themes. In the fourth step, the researcher recursively reviewed and refined themes. As stated by Braun and Clarke (2006), "the need for re-coding from the data set is to be expected as coding is

an ongoing organic process" (p. 91). Reviewing and refining themes at this stage is done at two levels (Clarke & Braun, 2016). During the first level of reviewing and refining themes, the researcher revised each theme and read the corresponding data extracts to ensure that they fit together and form a coherent pattern (Braun & Clarke, 2006). If a data extract did not fit with a specific theme, the researcher created a new theme, placed it under a different theme, or discarded it. Once all generated themes and their corresponding extracts were reviewed and appeared to fit coherently, the researcher moved to the second level and reviewed themes in relation to the entire data set. The researcher then revised the themes to ensure that they were clear, distinct, and related to the research questions. In the fifth step, the researcher named and defined themes. The researcher gave each theme a descriptive name and provided a definition and a narrative description. This step also included associating the theme with the related research question. For the sixth step, the researcher produced a report summarizing the final qualitative analysis findings.

Role of the Researcher

At the time of this study, the researcher served as an instructional designer for the college in which the HyFlex courses were offered. The researcher's responsibilities included managing all the Blackboard courses offered by the college, offering training and workshops, and providing instructors with technological support and pedagogical consultation.

According to Maxwell (2012), a well-known threat to the validity of a study is the inherent bias of the researcher. He suggests that despite the difficulty of totally removing one's bias regarding a specific subject, a researcher should strive for a design that

minimizes the possible impact on the research findings and conclusions (Maxwell, 2012). The study researcher has strived to remain unbiased and neutral during the data collection and data analysis processes. She consistently reflected on her potential biases by setting aside her pre-perceived notion regarding the students' experiences with Hyflex courses.

Validity and Reliability

Creswell and Plano Clark (2017) define the validity in mixed methods design and analysis as "employing strategies that address potential issues in data collection, data analysis, and the interpretations that might compromise the merging or connecting of the quantitative and qualitative strands of the study and the conclusions drawn from the combination" (p. 239). Several measures were taken to ensure the validity and reliability of the data collection and the survey instrument. Content and face validity were established by an expert panel and a pilot test. The researcher, advisors, and two faculty members teaching HyFlex classes reviewed the instrument to ensure the questionnaire items adequately addressed the research questions and hypotheses under test. Based on the suggestions received, the instrument was modified.

Subsequently, the researcher conducted a pilot test that involved ten undergraduate students enrolled in HyFlex classes at different colleges. The purpose of the pilot test was to ensure that the questionnaire items were comprehensible, relevant, and appropriate. The ten participants were also encouraged to make suggestions for improvement, and some revisions were made based on their feedback. To ensure the validity and reliability of this study, the students used in the pilot test were not part of the final study.

The quantitative reliability of the instrument was also confirmed by the Cronbach's alpha score. The score measures the internal consistency of a set of scale or test items and shows how closely related a set of items are as a group (Laerd Statistics, 2018a). SPSS was used to determine the Cronbach's alpha values for the six survey items in the HyFlex Content and delivery section. A Cronbach's Alpha score of 0.84 was obtained, indicating a good level of internal consistency among the items.

Furthermore, the qualitative validity and reliability were enhanced by eliminating the researcher's bias, using interrater reliability agreement and triangulation. According to Maxwell (2012), a researcher's bias impacts the validity of a study. To enhance the confirmability of this study, the researcher strived to remain unbiased by using the reflexivity strategy. Polit and Beck (2010) define reflexivity as the process by which the researcher critically and consistently reflects on own beliefs and judgments and notes personal biases that could impact data collection and interpretation. Throughout the study, the researcher was reflexive and bracketed away her biases and prior assumptions to objectively interpret and present the findings of this study.

Furthermore, to ensure the qualitative analysis's reliability, credibility, and trustworthiness, the researcher used the intercoder agreement strategy, which refers to the extent to which multiple coders have applied the same codes in the same manner to the same text extract (Creswell & Plano Clark, 2017). According to Creswell (2014), intercoder agreement occurs "when two or more coders agree on the codes used for the same passage in text" (p. 242). A colleague well versed in qualitative coding and analysis served as a second coder. The researcher and the second coder coded 20% of the open-ended responses each and then compared their results. The goal was to identify

discrepancies among the codes, discuss them until an agreement was reached. The researcher and the second coder continued, coding the rest of the data separately. Codes were compared again, and an agreement was reached for the whole dataset.

In addition, the researcher used the triangulation strategy to strengthen the credibility and validity of this study. Triangulation is a validity procedure by which the researcher uses different methods to address the same phenomenon (Creswell & Plano Clark, 2017). By triangulating the qualitative data with the closed-ended questions, the researcher succeeded in: 1) viewing the phenomenon from different perspectives, 2) identifying inconsistencies, and 3) enhancing the credibility of the findings.

Ethical Procedures

Since this study involved human subject participation, the researcher sought approval from the university Institutional review board (IRB) before conducting the study (See appendix F). The purpose of the IRB approval was to ensure that the right and well-being of study participants were protected. The researcher followed the IRB-approved protocols to recruit participants and collect data for the pilot and main study. According to the IRB guidelines, the researcher sent an email invitation to participants (Appendix G), which included the informed consent form and a link to the study. The informed consent stipulated the voluntary participation in the study and emphasized the confidentiality and anonymity of their answers (see Appendix H). Also, per IRB approval, the researcher advised participants to contact her via email if they have questions about the study and informed them about the 5-points incentive given by the instructor when completing the survey (see Appendix H). The researcher maintained all

collected data in a password-protected personal computer. According to IRB regulations, all collected data will confidentially be kept for three years and will then be destroyed.

Summary

This convergent mixed-methods study aimed to investigate the effect of the HyFlex modality and its attendance flexibility policy on the students' satisfaction and perceived learning. This study focused on exploring whether the satisfaction and perception of the nontraditional students varied from the traditional students and finding factors leading to their attitudes toward the HyFlex modality. The instrument for collecting data was a questionnaire variant that included closed-and open-ended questions. The questionnaire's closed-ended items provided demographic information and quantitative data sources for all six research questions. The open-ended questions provided qualitative data sources for research questions 1 and 4. The researcher followed the IRB approval and guidelines to send the survey to all undergraduate students enrolled in HyFlex classes at a college of technology in a large university in the Southern United States. All data was collected via the Qualtrics survey platform. Quantitative data were analyzed using descriptive and inferential statistics using SPSS, version 27. Qualitative data were analyzed thematically using the Qualtrics Text IQ tool. Ethical considerations and the validity and reliability of data collection and analysis were also addressed in this chapter.

Chapter IV

Data Analysis and Results

This convergent mixed-methods study explored the following: 1) investigate the effect of the HyFlex modality and the flexibility of its attendance policy on students' satisfaction with the HyFlex modality, 2) examine the effect of the HyFlex modality on the students' perception of their learning experience, and 3) determine the differences between traditional and nontraditional students regarding their satisfaction and their perception of the HyFlex modality. The study involved 162 undergraduate students enrolled in HyFlex classes in a college of technology at at a large public southern urban university. The investigation included six research questions and used a questionnaire variant to collect data. The quantitative data included 20 closed-ended questions, and the qualitative data included three open-ended questions.

The chapter starts with a review of the research questions guiding this study. Then provides a summary of data collection and cleaning procedures. Next, the analysis results of the quantitative and qualitative data is presented. The chapter concludes with a summary of findings.

Research Questions

The collected data was used to answer the following research questions:

RQ1: How do students perceive their overall satisfaction with the HyFlex courses?

RQ2: Is there a statistically significant difference between nontraditional students' and traditional students' overall satisfaction with the HyFlex modality?

RQ3. Is there a correlation between students' overall satisfaction and the six

subscales of "HyFlex Content and Delivery"?

RQ4: How do students perceive the impact of HyFlex modality on their learning?

RQ5. To what extent, if any, is there a statistically significant difference between

how nontraditional and traditional students perceive the impact of the

HyFlex modality on their learning?

RQ6. How does perceived learning relate to students' intention to enroll in

HyFlex classes in the future?

RQ1 and RQ4 were analyzed quantitatively using descriptive statistics. RQ2 and

RQ5 were answered using the Mann-Whitney U test. RQ3 and RQ6 were examined using

Spearman's correlation test. To further understand factors leading to students'

satisfaction with the HyFlex modality and its impact on their learning, RQ1 and RQ4

were also addressed qualitatively using inductive thematic analysis to analyze

participants' responses to survey questions 22, 23, and 24.

Data Collection, Cleaning and Analysis Procedures.

Quantitative and qualitative data were collected using the Qualtrics XM online

survey platform. The data were collected in March and April of 2021. The survey was

sent to a total of 222 students. A high response rate of 82% ($n=193$) was received.

The quantitative data were analyzed statistically using Statistical Package for the

Social Science (SPSS) version 27. Qualitative data was analyzed manually using the

thematic analysis approach and Qualtrics Text IQ tool .

The 193 responses were first screened manually and then screened with SPSS.

Such screening resulted in a usable sample of 162 responses. A total of 31 responses were

removed. Five responses were removed because participants declined to approve of the consent form. Twenty-two participants were removed because they did not enter any data ($n=7$) or only completed a small part of the survey ($n=15$). Four participants took the survey twice (through two different courses). Only the first set of their responses provided by those participants was kept ($n=4$). Furthermore, responses were checked visually for originality, and responses from the same IP address were only used if the responses were different. As a result, a total of 162 participants provided data for this study.

Demographic Analysis

The age of the respondents ranged from 18 to 65+ years. Of the 162 who participated in this study, 65.4% were between 18 and 24 years ($n=106$), 25%.9 between 25 and 34 years ($n=42$), 4.9% were between 35 and 44 years ($n=8$), 1.2% between 45 and 54 years ($n=2$), and 0.6% reported being 65+ years ($n=1$). Three respondents didn't disclose their age (1.9 %). Regarding the ethnicity, 50% identified themselves as Hispanic ($n=81$), 22.8% as white/Caucasian ($n=37$), 14.8% as Asian/Pacific Islander ($n=24$), 6.2% as Black/African American ($n=10$), 2.5% as having multiple ethnicities ($n=4$), 0.6% as American Indian/Alaskan Native ($n=1$) and 1.2% as being from other ethnicities ($n=2$). Three respondents didn't disclose their ethnicity (1.9%).

In terms of gender distribution, 76.5% were male ($n=124$), and 22.8% were female ($n=37$). However, one respondent didn't disclose the gender (0.6%). For the academic level distribution, 9.3% were freshmen ($n=15$), 29.6% were sophomores ($n=48$), 36.4% were juniors ($n=59$), and 24.7 were seniors ($n=40$).

As for the employment status, there were 32.7% students working fulltime (*n=53*), 38.3% were working part-time (*n=62*), and 29% were not employed (*n=47*). Concerning the family status, 79.9% were single (*n=128*), 12.3% were married (*n=20*), 5.6% were married with children (*n=9*), 1.2 % were single parents (*n=2*), and 1.2 % were divorced (*n=2*). One respondent did not disclose the family status (0.6%). For the college enrollment status, 85.2% were enrolled fulltime (*n= 138*) and 14.8% were enrolled part-time (*n=24*).

As far as the participants' financial status, 46.3% (*n=75*) indicated that they were financially dependent on their parents, 27.8% (*n=45*) were financially independent, 25.9% (*n=42*) reported that they were self-supporting but had help from other sources. The other sources included parents (*n=8*), spouses (*n=2*), FAFSA (*n=2*), older brother (*n=1*), VA (*n=1*), student loans, grants, and small savings (*n= 1*), and living at home (*n=1*).

Regarding the high school degrees, 94.4% (*n=153*) received a high school diploma, 5.6% (*n=9*) received either GED/equivalent diploma. Concerning students' enrollment in college within one year of high school graduation, 80.9% (*n=131*) reported that they did enroll in college the same year, 19.1% (*n=31*) reported that they did not enroll in college the same year of their graduation.

As for enrollment in HyFlex classes in previous semesters, 65.4% reported that they did, 34.6 % reported that they did not. Appendix I contains the demographic information of all participants.

Traditionality Status Binary Variable

The National Center for Educational Statistics (NCES) defined nontraditional students as those who have at least one of the following characteristics: a) being 25 years or older, b) being financially independent, c) enrolled in college part-time, d) delayed enrollment into postsecondary education by a year or more after high school, e) being employed fulltime, f) having one or more dependents, g) being single-parent, and h) not having a high school diploma (Radford et al., 2015). A traditionality status binary variable was developed to categorize survey respondents into traditional and nontraditional students based on this definition. Traditional students were coded as (0) and nontraditional students as (1). To create the traditionality status binary variable, six binary variables were constructed first from the following demographic data: age, financial status, employment status, family status, high school diploma versus GED, and college enrollment year.

Age. a binary variable "Binary_Age" was created to classify traditional and nontraditional students by age. Students who reported their age to be between 18 and 24 were coded as (0), while all others being older than 25 years were coded as (1). Based on this, 32.6% of participants were 25 years or older (*n*=56).

Financial status. A binary variable "Binary_Financial Status" was created to classify traditional and nontraditional students based on their financial dependency. Respondents who reported their financial status as financially independent (self-supporting) were coded as (1). Respondents who reported that they were financially dependent (totally or partially) were coded as (0). Based on this, 27.8% (*n*=45) participants were financially independent.

Employment Status. A binary variable "Binanry_Employment Status" was created to classify students based on their employment status. Respondents who reported their employment status as employed full-time (30+ hours per week) were coded as (1). Respondents who reported that they were unemployed or employed only part-time were coded as (0). Based on this, 32.7% (n=53) of participants were working full-time.

Family Status. A binary variable "Binanry_Family Status" was created to classify students according to their family status. Respondents who reported their family status as single parent or married with children were coded as (1). Respondents who reported that they were single, never married, married, divorced, or widowed were all coded as (0). Based on the family status binary variable, 6.8% (n=11) of participants have dependents.

High school diploma vs GED. A binary variable "Binary_HS vs. GED" was created to classify students according to their secondary diplomas. Respondents who reported receiving a GED/equivalent diploma, were classified as nontraditional and were coded as (1). Respondents who reported receiving a high school diploma were coded as (0). Based on this, 5.6% (n=9) of participants received a GED/alternative high school credentials.

College enrollment year. A binary variable "Binary_College Enrollment_year" was created to identify students based on their year of enrollment into postsecondary education. Participants who reported enrolling into college the same year they graduated high school were considered traditional and were coded as (0). Students who reported not enrolling into college the same year they graduated high school were considered

nontraditional and were coded as (1). Based on this, 19.1% (n=11) of respondents reported delaying enrollment into postsecondary education by at least one year.

Based on the criteria mentioned above, respondents who received at least a score of (1) in any binary classification (i.e., Binary_Age, Binary_Financial Status, Binary_Employment Status, Binary_Enrollement Status, Binary_Family Status, Binary_HS vs. GED, and Q11_College Enrollment Year) were placed in another binary variable (Binary_Traditionality Status) and recoded as (1). All others were recoded as (0). As a result, 60.5% (n=98) were nontraditional students, and 39.5% (n=64) were traditional students. Table 2 displays the frequency and percentage distribution of traditional and nontraditional students.

Table 2

Frequency and Percentage Distribution of Traditional and Nontraditional Students

	N	%
Nontraditional Students	98	60.5
Traditional Students	64	39.5

Quantitative Results

The data was collected using a survey/questionnaire that was administered via Qualtrics. The collected quantitative data addressed the six research questions RQ1-RQ6. SPSS version 27 was used to analyze the data collected. Data analysis included descriptive statistics, Mann-Whitney U test, and Spearman's rank-order correlation.

RQ1 Results

The first research question gauged the students' overall satisfaction with the HyFlex modality. Responses to survey item #19 provided the data for this question. Out of 162 participants, 158 students answered this question. The participants indicated a high overall satisfaction level with a mean score of 5.15 on a 6-points Likert scale (M=3.45, SD=.918). Table 3 provides the frequency and percentages of the overall satisfaction rating by all students.

Table 3

Frequency and Percentage of Overall Satisfaction with HyFlex Classes - All Students

Response	$\underline{N}$	$\underline{\%}$
Extremely satisfied	66	40.7
Mostly satisfied	60	37
Slightly satisfied	25	15.4
Slightly dissatisfied	5	3.1
Mostly dissatisfied	1	0.6
Extremely dissatisfied	1	0.6

Note. Responses are on a 6 point scale, 6 being extremely satisfied. N=158

RQ2 Results

The second research question sought to ascertain whether a difference in overall satisfaction with HyFlex classes exists between the traditional and nontraditional students. Two Hypotheses were tested. The null hypothesis proposed that there is no significant difference in the overall satisfaction between traditional and nontraditional students. The alternative hypotheses suggested that there is a significant difference in the

overall satisfaction between traditional and nontraditional students. A Mann-Whitney U test with a confidence level of 95% was used to test the hypotheses and examine the statistical difference between the two groups of students. A statistically significant difference is considered when the p-value is less than .05.

As shown in Table 4, the results of the Mann-Whitney U test indicated that nontraditional students' overall satisfaction mean rank score was significantly higher (Mean rank = 87.79, n=95) compared to traditional students (Mean rank = 66.99, n= 63).

Table 4

Mean Ranks of Traditional and Nontraditional Students Regarding Overall Satisfaction

	N	Mean Rank	Sum of Ranks
Traditional Students	63	66.99	4220.50
Nontraditional Students	95	87.79	8340.50

Moreover, as seen in Table 5, the Mann-Whitney U test results revealed a statistically significant difference in the overall satisfaction between traditional and nontraditional students (U = 2204.5, Z = -3, p =.003). Since the calculated p-value of the Mann-Whitney U test was .003 and less than the significance level a = 0.05, the null hypothesis was rejected.

Table 5

Mann-Whitney Test Results - Students' Overall Satisfaction

	Q19_Overall level of satisfaction with the HyFlex course
Mann-Whitney U	2204.500
Wilcoxon W	4220.500
Z	-3.003
Asymp. Sig. (2-tailed)	.003

Note. Grouping Variable: Binary_Traditionality Status

RQ3 Results

The third research question explored the correlation between students' overall satisfaction and the six subscales of "HyFlex Content and Delivery." In other words, this research question intends to find out if there is a positive monotonic relationship between overall satisfaction and the following six variables: a) clarity of course requirement and expectations (Q13), b) challenging assignments (Q14), c) meaningful learning activities (Q15), d) content organization (Q16), e) accommodation of attendance mode (Q17), and f) effective use of LMS (Q18) (see the subscaled questions in Appendix C).

Two hypotheses were tested to investigate the relationship between the six items mentioned above and the overall satisfaction. The null hypothesis proposed no statistically significant correlation between the overall satisfaction and the course content and delivery variables (i.e., clarity of course requirement and expectations, sufficiently challenging assignments, meaningful learning activities, content organization, accommodation of attendance mode, and effective use of LMS). The alternative hypothesis proposed a significant correlation between the overall satisfaction and the

course content and delivery variables (i.e., clarity of course requirement and expectations, sufficiently challenging assignments, meaningful learning activities, content organization, accommodation of attendance mode, and effective use of LMS).

Since the dependent and independent variables in this research questions are measured at the ordinal level, the non-parametric Spearman's rank-order correlation test (Spearman's rho) was used to test the hypotheses.

As shown in Table 6, the results of the spearman's correlation test showed that there was a statistically significant positive monotonic correlation between students' overall satisfaction HyFlex classes (Q19) and all six items of the survey section "HyFlex Course and Delivery" (Q13-18) at .001 significance level.

The strongest positive correlation was observed between students' overall satisfaction and "Q17_Accommodation of Attendance Mode" (r_s = .66, p < .001, N= 158). The second strongest correlation was between students' overall satisfaction and "Q13_Clarity of Course Requirement and Expectations" (r_s = .61, p < .001, N= 157) and between students' overall satisfaction and "Q16_Course organization" (r_s = .61, p < .001, N= 158).

There was a moderate positive monotonic relationship between students' overall satisfaction and "Q15_meaningful learning activities (r_s = .59, p < .001, N= 158), and between students' overall satisfaction and "Q18_effective use of LMS" (r_s = .57, p < .001, N= 158). A weak positive monotonic relationship was between students' overall satisfaction with Hyflex classes and "Q14_sufficiently challenging assignments" (r_s = .31, p < .001, N= 157).

Table 6

Spearman's Correlation Test Results – Relationship between Overall Satisfaction and

HyFlex Content and Delivery Subscales

		Q19_Overall level of satisfaction with the HyFlex course
Q13_Course requirements and expectations are clearly stated	Correlation Coefficient Sig. (2-tailed) N	.61** .000 157
Q14_Sufficiently challenged with assignments	Correlation Coefficient Sig. (2-tailed) N	.31** .000 157
Q15_Provided meaningful learning activities	Correlation Coefficient Sig. (2-tailed) N	.59** .000 158
Q16_Course is organized in a way for me to understand the course content	Correlation Coefficient Sig. (2-tailed) N	.61** .000 158
Q17_Course content is presented in ways to accommodate my attendance mode	Correlation Coefficient Sig. (2-tailed) N	.66** .000 158
Q18_Learning management system (Blackboard) is used effectively to present the course content	Correlation Coefficient Sig. (2-tailed) N	.57** .000 158

Note. Correlation is significant at the 0.01 level (2-tailed).

RQ4 Results

Research question four assessed how the students perceived the impact of the

HyFlex modality on their learning. Survey question #21 provided the data for this

research. The answers to question #21 were rated using a 6-point Likert scale ranging

from "extremely negative impact" (1) and "extremely positive impact" (6). Frequencies

and descriptive statistics were used to analyze and report data.

Of the 162 survey respondents, 158 students answered this question. As shown in Table 7, the descriptive statistical analysis revealed that students perceived the impact of Hyflex on their learning within the positive category as the overall mean score was 5.30 ($SD = 0.80$).

Table 7

Descriptive Data of Impact of HyFlex courses on Students' Learning

	N	Mean	SD
Q19_Impact of HyFlex courses on Students' Learning	158	5.30	0.80

Note. Responses are on a 6 points scale, with 6 being extremely satisfied.

The majority of students felt that the flexibility of the attendance policy had a positive or extremely positive impact on their learning. 46.9% answered extremely positive impact ($n=76$), 35.8% positive impact ($n=58$), 13% slightly positive impact. Only 1.8% of the respondents reported a negative impact ($n=3$). Table 8 presents a summary of the detailed frequency and percentage distribution.

Table 8

Frequency and Percentage Distribution for Perceived Impact on Learning

	N	%
Extremely positive impact on my learning	76	46.9%
Positive impact on my learning	58	35.8%
Slightly positive impact on my learning	21	13.0%
Slightly negative impact on my learning	2	1.2%
Negative impact on my learning	1	0.6%
Extremely negative impact on my learning	0	0

Note. Responses are on a 6 points scale, with 6 being extremely positive impact. N=158

RQ5 Results

The fifth research question sought to ascertain whether a difference in perception exists between the traditional and nontraditional students regarding the impact of the HyFlex modality on their learning. This was determined by testing two hypotheses: a) the null hypothesis proposed no significant difference in perception between traditional and nontraditional students, b) the alternative hypothesis suggested a significant difference in perception between traditional and nontraditional students. A Mann-Whitney U test with a confidence level of 95% was used to test the hypotheses and examine the statistical difference between the two groups of students. A statistically significant difference is considered when the *p*-value is less than .05.

As shown in Table 9, the results of the Mann-Whitney U test revealed that nontraditional students' perceived positive impact on learning was significantly higher (Mean rank = 88.13, *n*=95) than traditional students (Mean rank = 66.48, *n*= 63).

Table 9

Mean Ranks of Comparison of Traditional and Nontraditional Students Regarding

Perceived Impact of HyFlex on Learning

	N	Mean Rank	Sum of Ranks
Traditional Students	63	66.48	4188.50
Nontraditional Students	95	88.13	8372.50

Moreover, as shown in Table 10, the calculated p-value of the Mann-Whitney U

test was .001 and was less than the significance level $a = 0.05$. Therefore, the null

hypothesis was rejected. The Mann-Whitney U test supported the alternative hypothesis

that there is a significant difference in perception between traditional and nontraditional

students regarding the impact of HyFlex classes on their learning ($U = 2172.5$, $Z = -3.2$, p

$=.001$).

Table 10

Mann-Whitney Test Results - Impact of HyFlex on Students' Learning

	Q20_Impact of HyFlex on learning
Mann-Whitney U	2172.500
Wilcoxon W	4188.500
Z	-3.183
Asymp. Sig. (2-tailed)	.001

Note. Grouping Variable: Binary_Traditionality Status

RQ6 Results

Research question 6 intended to determine whether there was a relationship

between the degree of perceived learning and students' intention to enroll in the future in

HyFlex classes. Two hypotheses were tested to answer this research question. The null

hypothesis proposed no statistically significant correlation between the perceived impact of HyFlex modality on students' learning and intention to enroll in HyFlex classes in the future. The alternative hypothesis suggested a statistically significant correlation between the perceived impact of HyFlex modality on students' learning and their intention to enroll in HyFlex classes in the future. Since both variables are measured at the ordinal level, the non-parametric Spearman's rank-order correlation test was used to address this question.

As shown in Table 11, the results of the spearman's correlation test indicated that there was a statistically significant moderate positive monotonic correlation between students' perceived impact of HyFlex modality on their learning and intention to enroll in HyFlex classes in the future (r_s (158) = 0.57, $p < .001$). Thus, the null hypothesis was rejected, and the alternative hypothesis was accepted.

Table 11

Spearman's Correlation Test Results for Perceived Impact of HyFlex on Learning and Intention to enroll in HyFlex Classes in the Future

		Q20_Impact of HyFlex on learning
Q21_Intention to enroll in HyFlex courses in the Future	Correlation Coefficient	.567
	Sig. (2-tailed)	.000
	N	158

Note. Correlation is significant at the 0.01 level (2-tailed).

Qualitative Findings

This study used a convergent mixed methods research design to collect the quantitative and qualitative data simultaneously. Creswell and Plano Clark (2017) argued that although this type of mixed methods may not yield highly rigorous qualitative data, it provides "the researcher with emergent themes and interesting quotes that can be used to

validate and embellish the quantitative survey findings" (p. 73). As observed in the study

presented here, the qualitative data collected from the open-ended survey questions

supplemented the quantitative data and was "used to confirm or validate the results from

the closed-ended questions" (Creswell & Plano Clark, 2017, p. 73).

In the survey instrument, the three open-ended questions (Q22, Q23, and Q24)

were a means to obtain more insight into the research questions 1 and 4:

RQ1. How do students perceive their overall satisfaction with the HyFlex

courses?"

RQ4. How do students perceive the impact of the HyFlex modality on their

learning?

To gain a broader perspective of factors influencing students' satisfaction or

dissatisfaction with the HyFlex classes and to explore the perceived impact of HyFlex

modality on students' learning, the participants were asked to provide a written response

to the following three open-ended questions:

1. By giving you the choice to attend each class session in the mode of your

preference, do you feel that you are learning more, less, or the same as in

other teaching formats? Explain. (Q22)

2. How does the flexibility in attendance affect your overall satisfaction with this

course? Explain. (Q23)

3. Do you have more feedback about your experience with the HyFlex course

format you would like to share? (Q24)

The purpose of question Q22 was to qualitatively gauge the students' perception

of the impact of HyFlex modality on their learning and identify the contributing factors

leading to this perception. Question Q23 was intended to qualitatively gauge the students' overall satisfaction level with HyFlex courses and understand the factors leading to their satisfaction or dissatisfaction. Question Q24 was used to encourage participants to provide further feedback and comments regarding the HyFlex modality. The qualitative data collected from these three open-ended questions were analyzed thematically using the Qualtrics® Text IQ tool.

Out of the 162 participants, 140 participants provided usable responses to question Q22, 136 students provided usable responses to question Q23, and 64 provided usable feedback to Q24. Responses that were ambiguous (hard to interpret), too short (abrupt), or did not address the research questions were deemed unusable and therefore discarded. Examples of these short (abrupt) responses include: "yes," "no," "great," "a little of both," and "it doesn't." Examples of responses that were ambiguous and hard to interpret are: "I feel that the lectures have not completely adapted to online and offline format completely." and "Yes, I would like to speak to how engagement is far different in a HyFlex class than an in-person class." An example of a response that did not answer the question include: "I just want to graduate with S on my transcripts."

All responses to the open-ended questions were coded manually using the Text IQ tool of Qualtrics. The text IQ tool allowed the user to create topics/codes for the responses and group them under parent topics. To code the data and find emerging themes, the researcher followed the six-phase thematic analysis model Braun and Clarke (2006) recommended. The section below describes the details of the thematic analysis procedure and findings.

Thematic Analysis Procedure

The procedure of analyzing the data thematically involved the following phases: 1) familiarization with the data, 2) generation of initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing a final report.

Phase 1 - Familiarization with the data: the researcher immersed herself in the collected data by reading the responses, reviewing them multiple times, and noting relevant information in a notebook. Once the researcher became thoroughly familiar with the data collected, she moved to the second phase.

Phase 2 - Generating Initial Codes: The researcher read each response line by line and labeled it with an initial code. Some of the responses necessitated only one code, while others necessitated multiple codes. Once the data for the three open-ended questions were coded, the researcher moved to the third phase.

Phase 3 - Searching for Themes: The researcher used a mind map tool to identify patterns and relationships among the initial codes. Codes that shared similar meanings were consolidated into potential themes (Subthemes). Finding themes was an iterative process and required the researcher to reread the responses of each code several times and sometimes move some codes to other subthemes or themes. This phase resulted in the identification of three themes that were further refined during the fourth phase.

Phase 4 - Reviewing Themes: The researcher reviewed the accuracy of each theme by verifying a strong coherence between the response, its assigned code, and theme. This phase was also iterative and required the researcher to create, remove, or merge themes. In addition, the researcher reviewed the themes to ensure they were

distinctive and clear. This stage resulted in the identification of three themes and six subthemes.

Phase 5 - Defining and Naming Themes: The researcher reviewed further the responses, codes, subthemes, and themes. The purpose was to ensure that the names given to the subthemes and themes were descriptive enough and related clearly to the research question.

Phase 6 – Producing Final Report: The researcher reported the results of the qualitative analysis. The same themes emerged across all three open-ended questions. Therefore, the researcher decided to present the findings by themes instead of presenting them by research question. The researcher also included students' narratives and quotes to support the themes and subthemes discussed. To improve the readability, the researcher edited some students' responses by correcting their spelling and grammatical mistakes (e.g. "Hiflex" to "HyFlex," and "i' to "I."

Emerged Themes

Three themes emerged from analyzing the responses to the three open-ended survey questions (Q22, Q23, and Q24). The emerging themes were as follows: 1) Improved Students' Learning Experiences and Outcomes, 2) Improved Student's Life, and 3) Concerns and Hopes. The first theme comprises two subthemes: a) enhanced and productive learning, and b) empowered learning. The second theme covers two subthemes: a) balanced life, and b) decreased personal and contextual stressors. The third theme included two subthemes: a) concerns, and b) hopes. Figure 4 below displays the themes and their corresponding subthemes.

Figure 4

Overview of Themes and Subthemes
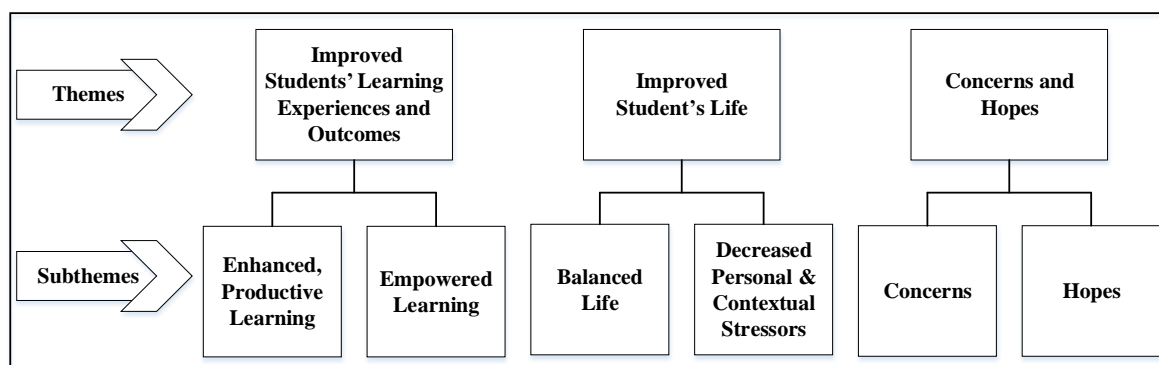
Theme 1: Improved learning experiences and outcomes

In reviewing the responses to the three open-ended questions, it became apparent that participants perceived the HyFlex modality improved their learning experiences and outcomes and empowered them to engage effectively with their studies. This theme evolved from combining two subthemes: 1.1) enhanced, productive learning experience, and 1.2) empowered learning.

Subtheme 1.1: Enhanced and Productive learning.

The subtheme of enhanced and productive learning was prevalent in the responses across all three open-ended responses. Several students noted that the availability of recorded lectures and the flexible attendance policy positively impacted their learning and performance. According to many respondents, recorded lectures were used either as a learning tool or a substitute for attendance. Either way, it contributed to a positive learning experience. Also, the flexible attendance policy enabled students to attend the class in the mode of their choice, which resulted in them not missing classes and contributed to an improved learning experience.

Availability of course material. When asked about the impact of the HyFlex modality on their learning in comparison to other modalities, one student stated:

It's equivalent because most of the material is already provided by the professor which you can find it on blackboard. The instructions are clear on syllabus and regarding learning it's really no difference because the material to study is there as well.

Another student shared, "I feel that I am learning the same as in person as I am receiving the same amount of learning material with more flexibility." Another student shared, "I believe I am learning like if I were in class. I am able to have all my questions answered and understand the concepts." Another student reported:

The flexibility is great because my mom was very sick a week before spring break and I had to travel to Mexico to take care of her and the flexibility of hyflex courses gave me the freedom to travel and take care of very important personal business and I was able to catch up on the material during spring break.

Recorded lectures as a learning tool. Many respondents expressed satisfaction with the recorded lectures that they perceived as positively contributing to their learning because they used it as a learning tool. Some students used the recorded lectures to enhance their understanding of the content. For example, one student wrote: "I'm very satisfied , …..and I can go back and watch the recordings if I don't understand or have a question about something." Another student shared: "I feel like I am learning more, since I can go back and replay the lectures as many times as I want".

Many other students discussed how recorded lectures enabled them to learn better because they watched them at a pace that matched their preferences and cognitive loads.

One student wrote: "I believe I am learning more because I can go at my own pace and re-watch the lectures and completely understand what I am learning." Another student stated: "We are learning more because we are able to set ourselves ready for class when we are able to, and have the ability to go back and look at the recording if needed, or pause the video if the professor is going too fast."

Many students also shared that the recorded lectures were helpful to study for assignments and exams. A student stated: "I feel like I am learning more mostly because I have the option of going back and listening to the lectures again which is a great way to review for exams and other assignments." Another student wrote, "I prefer to attend class remotely but having future recordings for homework are very helpful!"

Some students also shared that they used the recorded lectures to take better notes, which positively impacted their learning. One student wrote: "….with the choice to sit at home and listen or re watch it for more diligent note taking has helped so tremendously." Another student stated: "…it's easier for me to be able to get notes from videos."

Recorded lectures as a substitute to attendance. In addition, students shared that they used the recorded lectures as a substitute for class attendance. One student wrote: "It is great when work or personal things come up and unfortunately have to miss lecture but a recorded lecture video helps catch right back up on the material." Another student wrote:

> I feel I'm learning in the same way, or more, as taking classes in person, but I definitely feel I'm learning more than just taking online classes. The opportunity to have recorded classes is a BIG advantage for those like me, with a very tight

schedule. I will really thankful if we have the opportunity to have HyFlex classes in the future.

Enhanced attendance. The attendance choice appeared as a positive factor contributing to increased attendance and consequently to improved learning. Many participants shared that they did not miss a session because they had a choice to attend it either synchronously or asynchronously. One student shared: "Flexibility in attendance definitely makes me more satisfied with the course! I have definitely attended every class and not had to miss now." Another student stated:

I feel that I am learning more because sometimes when I have a time when I need to be elsewhere instead of class, I can actually attend class while I'm doing other things. This allows me to actually attend class while the professor is teaching no matter what I have going on.

A different student wrote:

…I try to go every day to class but an emergency might come, not just for me but for any other student with responsibilities who might also have other responsibilities, it is a great flexibility for students to keep learning and not miss a class.

More time to study. Students also shared that the HyFlex modality enabled them to avoid commuting and use this time to study. One student wrote: "I'm satisfied with the flexibility because I do not have to commute, which gives more time to study and prepare for classes as scheduled." Another student shared:" I feel I am learning more, because I have more time to study. It saves me time being at home taking my class. When I use to commute to school and from school, it usually would take me 2 hours to arrive to my

destination. So I felt I lost 2 hours for studying or focusing on my class." Another stated: "I am very satisfied with this course. Being able to take class from home ups my productivity because I no longer have to commute 45 minutes to school."

Increased retention. Flexible attendance choices also contributed to increased students retention as one participant discussed how the HyFlex modality saved the student from dropping college. The student wrote:

> I feel like hyflex has allowed me to continue my college education despite the severe effects of the COVID pandemic. I had lost my job and was temporarily homeless the first few months of the pandemic but eventually found a job as a live-in nanny that also provides housing. If hyflex was not an option I am almost certain I would have dropped out of college.

Subtheme 1.2: Empowered learning

Many participants reported the subtheme of empowered learning. They shared that being in control of their own learning enabled them to engage effectively with their courses and develop self-regulated learning skills. According to several respondents, being in control of time, attendance mode, and learning place positively impacted their learning and led to their satisfaction with the HyFlex modality.

Being in control of own learning. Many participants expressed their satisfaction with the Hyflex modality because it empowered them to be in control and take charge of their own learning, which led them to perceive this modality as having a positive impact on their learning. One student wrote:

> I feel I am learning more because the option to watch the recorded lecture at a later more comfortable time of my choosing has enhanced my understanding of

the content and coursework of the class. Some classes have time slots that are too late or too early which often times causes a decrease in the effectiveness of teaching the material. Hyflex solves this problems as it gives me the option to learn the material in the method which I find the most effective for me, and it also benefits other students as they also have the option to attend the class whichever method they deem is best for them.

Another student shared:

I feel that I am more in control of my courses and that I am able to do my work and study without having the pressure of having to attend class. Although I prefer to listen to the professor in person, I love having the choice to not attend because sometimes work requires me to stay longer and I am not able to make it to class.

Being in control of time. Furthermore, several students shared that being in control of their time empowered them to manage their schedules effectively. One student wrote: "The attendance flexibility is great I get to work on my own time and allows me to not overwhelm myself with work and school. It allows me to manage my time and workloads throughout the week." Others expressed that being in control of their time empowered them to take more classes. One student wrote: "I feel that I am learning more because not only do I get to work on assignments when it is convenient to me being a fulltime employee but also gives me the option to take multiple courses each semester." Another student shared: "Yes, I love the flexibility you get in a Hyflex course. I can equally balance the times with other courses."

Other respondents shared that being in control of the studying time empowered them to learn when cognitively able to process the learning material. One student shared:

I feel I am learning more because the option to watch the recorded lecture at a later more comfortable time of my choosing has enhanced my understanding of the content and coursework of the class. Some classes have time slots that are too late or too early which often times causes a decrease in the effectiveness of teaching the material. Hyflex solves this problems as it gives me the option to learn the material in the method which I find the most effective for me, and it also benefits other students as they also have the option to attend the class whichever method they deem is best for them.

Another student shared:

We are learning more because we are able to set ourselves ready for class when we are able to, and have the ability to go back and look at the recording if needed, or pause the video if the professor is going too fast.

Being in control of mode of attendance. Multiple participants emphasized that being in control of the delivery mode was empowering because it allowed them to study in the mode that matches best their learning style. One respondent wrote:

…I have a whiteboard at home I can draw on the same diagrams professor is drawing in class, i can't do this in face to face, i have to sit down and draw on paper which isn't as effective as standing and drawing on a white board.

Another student shared:

I feel that I am learning a bit more than when in a regular class environment. I work from home and sometimes have a busy schedule when not working, HyFlex makes it more convenient for me in my current situation. I especially like that I

am able to hear and see the professor talk while I take notes and multitask in the computer during the course.

Other students noted that the flexibility in choosing the learning mode empowered them to engage effectively with their studies. One student wrote: "If I have any trouble and want to go face to face, I have that option available to me, which is very helpful." Another student shared: "Greatly. I work full-time, and this gives me the opportunity to attend class at my leisure all while still putting in the required amount of work to succeed in this class"

Being in control of place of studying. Many other students reported that being in control of the place of their learning empowered them to study effectively. One student wrote: "I feel like I am learning more since I can keep up better with my classes from home" Another student shared, "…being able to be in the comfort of my home and not having to travel downtown for a class helps a ton in being at every single class."

Improved self-regulated learning skills. In addition to feeling empowered to engage with their learning materials, many students shared that the HyFlex modality aided them in developing self-regulated learning skills. One student wrote: "I am able to learn to organize my time better and utilize the free time I have to focus more on completing my assignments and gain knowledge." Another student stated: "Hyflex has helped a ton in keeping me more responsible with my classes." Another student shared: "I am able to learn to organize my time better and utilize the free time I have to focus more on completing my assignments and gain knowledge."

Theme 2: Improved lifestyle

Improved student's lifestyle emerged as the second dominant theme across all responses to the three open-ended questions. Students shared that the HyFlex modality enabled a balanced life and less stressful access to the learning opportunity. It also allowed them to avoid commuting time to campus, save money, take more classes to complete their degrees, and work more hours to support their families. These non-academic factors resulted in students' improved lifestyles and hence contributed positively to their learning and satisfaction. This theme incorporates two subthemes: 2.1) balanced life and 2.2) Decreased personal and contextual stressors.

Subtheme 2.1: Balanced life

The participants reported that the HyFlex modality fostered a learning environment that allowed a school-life balance contributing to an improved lifestyle. Many students expressed that their lifestyle improved with this teaching mode. For example, one student wrote: "Quality of life has definitely increased since [university name] implemented the Hyflex program. I hope you leave this option available." Another student stated: "It allows me to work around what I need to get done and allows me to be successful in multiple aspects." Another wrote: "It makes things less stressful if I have something come up when I am scheduled to have class I have more flexibility."

Work-school balance. Many students emphasized that achieving work-school balance enabled them to use their time effectively and study efficiently. One student wrote: "I feel that the freedom to choose to be present in class or not has allowed me to have a work and school balance and has allowed me to use my actual free time to learn without the pressure of a schedule." Another student shared:

I feel that I am more in control of my courses and that I am able to do my work and study without having the pressure of having to attend class. Although I prefer to listen to the professor in person, I love having the choice to not attend because sometimes work requires me to stay longer and I am not able to make it to class.

Family-school balance. Students also seemed satisfied with the HyFlex modality because it enabled them to achieve family-school balance. Many students described how the HyFlex modality enabled them to take care of their families while still attending school. One student stated: "I'm thoroughly pleased with this flexibility, I am a stay at home mom and the kids are home online with school as well." Another student wrote:

I feel that had we not had this opportunity, I would not have been able to attend these courses. My husband has renal failure and recently had a stroke. My mother was diagnosed with Parkinson's disease. I am able to attend class while still taking care of their needs.

Another student shared:

The flexibility of this course is great. I had my mom who was sick and I had to take care of her and I am now currently with her and taking care of her in Mexico. I try to go every day to class but an emergency might come, not just for me but for any other student with responsibilities who might also have other responsibilities, it is a great flexibility for students to keep learning and not miss a class.

School-life balance. Many responses echoed that the HyFlex modality allowed the achievement of balancing students' school duties and other life obligations. One student wrote, "I definitely feel I'm learning more than just taking online classes. The

opportunity to have recorded classes is a BIG advantage for those like me, with a very tight schedule." Another student stated: "I feel like I am learning about the same in both formats by having the ability to switch between the mode depending on what I have going on during the week." Another shared: "I think hyflex is a better alternative than completely online classes or completely in person classes because students have a choice to switch up their mode of attendance based on their needs."

Subtheme 2.2: Decreased personal and contextual stressors

Students reported that HyFlex learning provided a relaxed, convenient, supportive, and accommodating learning experience. The availability of alternative attendance modes and the recorded lectures enabled them to avoid commuting to college and hence created convenient and relaxed access to education. Participants reported that HyFlex was supportive as it allowed them to work more hours and save money. According to several participants, this fact contributed to decreasing students' financial stress. Also, students shared that HyFlex learning accommodated students' health as it provided them with the flexibility of not attending class in person due to the pandemic.

Avoiding commute. Many students perceived commuting to campus as a burden or as an unnecessary additional stressor. One student shared: "I am more relaxed because I don't have to drive 45 minutes for one class." Another student wrote: "I have commuted since I enrolled in [university name] back in 2016. I would definitely agree that HyFlex has granted me a wonderful flexibility in not having to commute to school." Another student stated: "Highly satisfactory, I do not have to deal with traffic from driving, and even in class I learn better."

Many participants shared in their responses that they were full-time employees and that the long driving time to campus was hindering them from efficiently progressing towards their degrees. One student shared: "I feel that my learning has increased because of the hybrid schedule provided. I work full-time and having to drive after work to sit in a class for 3 hours, takes a toll on you." Another student wrote: "I honestly feel that I am learning a lot more. Typically, all my classes are in the evening. Once I get out of work, I drive to the main campus and have to sit through the class duration. Hyflex saves time and energy." Another student wrote: "This way I'm learning more since the daily tasks are focused on learning versus trying to get to and from school. The hardest part was getting to school and finding parking."

Many students shared how avoiding commuting to campus enabled them to be more productive in their studies as they used the commuting time to study. One student shared:

> I feel I am learning more, because I have more time to study. It saves me time being at home taking my class. When I use to commute to school and from school, it usually would take me 2 hrs to arrive to my destination. So I felt I lost 2 hrs for studying or focusing on my class.

A second student wrote, "I learn the same or more. I have a 45min-1hr commute to/from [University name] and can utilize that time to study."

Less stressful access to the class session. Students also shared that the HyFlex modality provided relaxed access to the learning opportunity in which they felt less stressed about attending classes in person. One student wrote: "I think it positively affects my overall satisfaction because it decreases the stress on constantly making it to class."

Another student stated: "I feel that I am able to learn more. As a full-time intern in construction, I feel much less stress trying to rush to class after work." Another student stated:

> I feel that the freedom to choose to be present in class or not has allowed me to have a work and school balance and has allowed me to use my actual free time to learn without the pressure of a schedule.

Many shared that the relaxed access to the learning opportunity in terms of feeling less worried and less guilty about not showing up for a class session. One student wrote: "It does make me feel better not to worry about attending but I do have to be more responsible." Another student stated: "Yes, it makes me more satisfied because I don't feel guilty for missing class due of work or other obligations."

Other students described feeling less stressed about missing class sessions because they could always access the recorded lectures. They described this as similar to having an attendance contingency plan. One student wrote:

> The hyflex format is a very good one because like me they may have some very important things to do that can make them not come to class or interrupt their student activities and cause them to miss on very important material that cannot be repeated if it was not recorded.

Another student stated: "I can be more productive by not worrying to drive and deal with the traffic. More importantly, I can always listen to the recorded class."

Decreased financial stress. Students also noted that the HyFlex modality was supportive in terms of reducing their financial stress. Students shared that the HyFlex courses allowed them to work more hours and to meet their financial obligations. For

example, one student shared: "For people that have jobs with high demands, hyflex courses are the perfect way to get an education and still support their financial needs." Another student wrote: "It helps me a lot in a way that I am able to still work and help provide for my parents and still be able to be in school." Another student stated: "It affects it a lot but in a good way i am able to work more hours at work to sustain a living."

Students also shared that the HyFlex modality enabled them to save money on gas, transportation, and parking. For example, one student shared: "In my opinion, hyflex course was very convenient because I didn't have to drive to the campus every other day, worry about parking and the cost of transportation, which all adds up." Another wrote: "Very satisfied although I wish it was more clear before the semester started because I purchased a parking permit. I honestly would not have had I known."

A student who does not have a car explained that the HyFlex modality allowed for a relaxed access to education. The student wrote: "Hyflex is suitable with my current situation (not having a car/transportation) and so I can work with this type of preference of course. I can be more productive by not worrying to drive and deal with the traffic."

Accommodating to students' health. Some students elaborated on how the HyFlex modality accommodated their health conditions. One student wrote: "It helps because I am not able to go on to campus because of Covid." Another student stated: "I really liked the Hyflex courses. I hope we have the Hyflex option for next semester as I still don't feel safe returning to campus."

Theme 3: Concerns and Hopes

This theme emerged across the three open-ended questions, but especially in the feedback for question Q24. Some participants discussed a few issues they perceived as potential challenges to students' success in HyFlex classes. Participants also shared their hopes regarding the future of this modality. This theme consists of two subthemes: 3.1) concerns and 3.2) hopes.

Subtheme 3.1: Concerns

In their concerns, participants brought up the issues of students' personal characteristics, students' preferences, instructors' teaching skills and attitude, and the suitability of HyFlex to certain types of classes. Many participants shared in their responses the challenges they faced in HyFlex classes. The responses related to the concerns subtheme are grouped under three types of concerns: 1) concerns related to students, 2) concerns related to instructors, and 3) concerns related to course type.

Concerns related to students. In this group of concerns, students shared personal challenges and expressed their preference for other modalities due to their need for interaction or lack of self-regulated learning skills.

Preference of other modalities. A few students discussed their preference for face-to-face classes as it matches more their learning style. One student wrote: "I am more of an in class learner. I feel I have struggled in some areas due to the online class format. Most likely due to my older age." Another student stated: "I always learn better when I can have an in person experience and am able to have face to face discussions." A student wrote: "I prefer in person since online I don't retain information"

Some students expressed their preference for face-to-face learning mode because of their personal need to interact with classmates and instructors. One student shared: "I try majority of the time to make the effort to be off class at same time with other people so I have an opportunity to ask questions with my professor's answer and classmates' answers." Another student wrote: "I always learn better when I can have an in-person experience and am able to have face-to-face discussions."

Two students voiced their preference for face-to-face classes and stated that they lacked self-motivation and self-discipline skills. One wrote: "I prefer courses where attendance is mandatory as it encourages me to be more active in the class." The other respondent shared: "Less. I feel like being in a classroom will have me more focused and less distraction."

Students' lack of self-motivation. A few participants expressed that their lack of self-motivation was challenging when enrolled in HyFlex classes. For example, one participant wrote:

The flexibility does not help me. Of course this is my fault, when attendance is not taken I do not make as much effort in attending and then do not go back to watch the lecture. Again, this is something I need to work on but I believe that's the case for most students too.

Another student stated:

I feel like sometimes I catch myself falling behind since we are not required to show up in teams. If I manage to watch the lectures on time then I feel like I have more than enough time to review throughout the week.

Participants also shared that their lack of academic self-discipline in HyFlex classes imposed a barrier to effective learning in this modality. One student stated: "I get easily distracted and don't learn as much." Another student shared: "It has its pros and cons, sometimes it's easy to miss a class and end up having lectures piled up, but like I said recordings help to understand more thoroughly."

Students' lack of technological skills. Two students expressed that the lack of technological skills was challenging in HyFlex classes. One student shared: "I feel I am learning the same either or, however some students aren't very well with technology." Another student wrote: "…I just wish that technology was easier to use…"

Role of the student. The participant's concerns also included the student's role when taking classes in this modality. Several students shared that the students play an essential role in HyFlex classes. The role involves the student's responsibility, commitment, and intrinsic motivation for learning. They considered this to be among the success factors for this modality. One student shared: "It does make me feel better not to worry about attending but I do have to be more responsible." Another student wrote: "…either I attend or not I do have to learn stuff for this course." A student wrote: "Learning depend on how much time you are putting in a class, regardless you are showing up on campus or attending through teams." Another shared: "I feel like I am learning the same depending on my own dedication to the class work." Another student shared: "Regardless of the mode it's on you to get out how much you want from each course."

Intrinsic motivation also surfaced as a students' success factor in HyFlex classes. One participant shared:

I feel like I'm learning about the same, depends on the classes, if it's a major related class like [course name], then I feel like I'll have the same motivation to learn, but if it's a core credit class like say [course name] for example, there's hardly any motivation due to it not being as much of an interest in the subject.

Concerns related to instructors. Students shared that few instructors lacked the necessary teaching skills (e.g., inability to explain concepts). Also, students shared that some instructors lacked the teaching skills specific to HyFlex. They discussed how some instructors lacked hybrid facilitation skills, communication skills, course organization skills, and skills dealing with the technologies necessary for HyFlex.

Instructors' lack of teaching skills. In some responses, students reported that the instructors' lack of teaching skills was challenging in HyFlex classes. One student shared: "….some professors are not able to deliver their knowledge clearly enough." Another student wrote: "I feel like some professor are better than other with hyflex because some professor do not do a good job with explaining the materials while others do better."

Instructors' lack of HyFlex teaching skills. Few students also raised concerns regarding the instructor's ability to teach a HyFlex class. One student wrote: "It depends on the professor. I have one professor that definitely should not ever teach a hyflex course. But I also have classes where teachers are prepared and fully capable of teaching a hyflex class." Another student suggested that instructors should be more trained in teaching HyFlex classes, "It would be better if the professors were properly trained to use it."

Instructor's lack of HyFlex facilitation skills. Some students shared that the instructors lacked HyFlex facilitation skills when teaching face-to-face and online students simultaneously. They felt that the instructors were providing more attention to face-to-face students or vice versa. They voiced feeling neglected, which affected their learning. One student wrote: ".... my professor has a Synchronous course and HyFlex concurrently which is very bad. She completely ignores online… When teaching she only teaches the in person class while not paying attention to the online part of the class." Another student shared: "I am mainly join class online. However, the classes seem to focus on face-to-face students than others. Online students like me are not able to follow the professors' instructions."

Another participant shared that when taught by an instructor who has HyFlex facilitation skills, the learning experience was positive. The student wrote:

I feel like it depends on the professor. I attend my class on Monday and it's going really well for me, but then on my Tuesday class, which I also always attend, the professor doesn't really pay much attention to the online people. If I have the right professor I learn about the same as in person, but if it isn't a great professor then I feel like I don't learn much.

Instructor's lack of communication skills. Students also raised concerns related to instructors not communicating effectively with students in the HyFlex class. One student wrote: "I feel like I'm learning the same as in other teaching formats. One issue however is that communication is lacking with some professors." Another student stated: "…She never replies to emails and the only to contact her is by the students going in person." One student shared that some instructors do not provide adequate feedback. One

student stated: "Though it's great, some professors do not communicate efficiently with their students and just give any grade they deem fit. Not really looking at the work that's being submitted."

Ineffective use of Blackboard. Some participants also discussed how some instructors lacked course organization skills which was a stressor to students. One student wrote: "Also, the way the class is formatted is very bad and does not follow an organized structure as some students have different due dates when it's the same class…" Another student stated: "Other Hyflex courses have worked but this does not seem to be working. It is very unorganized…" Another student shared: "my main issue is with blackboard and how each professor uses it differently. Some classes flow smooth and easy while others i have trouble finding certain assignments and quizzes which have costs me points."

Two other students shared that the Blackboard learning management system was not used effectively and that instructors were using other platforms to post class material. One student wrote:

> I feel that I am learning nearly the same as I would in class. The only thing I would change is professors using other platforms to present class material. It is useless and a waste of money. It is easier when all classes and assignments are on the same canvas.

The other student stated: "I feel that I am learning nearly same as in class. The only thing is professors not supplying assignments to blackboard and using other canvases such as top hat that I feel is 100% useless and a waste of money."

Instructors' attitude toward HyFlex modality. Few students also viewed the instructor's attitude as a barrier to their learning and satisfaction. Students shared that

some instructors were mandating face-to-face or online attendance, which defeated the fundamental feature of the HyFlex modality. One student wrote: "Although some professors make it mandatory to come to class even though their class is Hyflex, which contradicts the teaching style all together."

Also, some instructors were not providing lecture recordings for students who could not attend face-to-face or online synchronous. One student stated: "Some professors expect users to be online exactly at course time regardless of online format and do not provide recordings. This can defeat the purpose of online options." Another student shared:

> I would say professors should get adjusted to it, students had to adjust very quickly and many professors refuse to adjust, which causes suffering for both students and the learning process. Also they need to upload the lectures, many professors never upload them.

Concerns related to course type. A few participants expressed some concerns regarding the suitability of the HyFlex modality for particular course subject matter and course levels. A student wrote: "I feel like it depends on the course subject matter. Face to face is better if a computer program needs to be learned." Another student stated:

> The idea of HyFlex courses is great. But realistically speaking, I don't think these courses are effective because they give too much responsibility to students. Younger college students are more likely to not care to attend class, and older students have other responsibilities to attend to. This is solely speaking from experience and talking to many of my classmates. HyFlex does well with basic

classes but once you get to the higher level courses I really do not believe they are the best course of action for the future.

One student expressed frustration with the nature of HyFlex classes. The student shared that this mode of teaching splits the instructor's attention which impacts the students negatively. The student wrote: "In basically every hyflex course the professor has to be constantly switching from talking with online group to the in person group. This affects the students learning and also the professors teaching because he is being pulled in two different directions." Also, another student wrote: "I've taken the live online sessions and in person sessions for hyflex classes and the experience is better face to face. When it is online sometimes there are technical issues and sometimes other students unknowingly intercept the class."

A few students voiced their concerns regarding internet reliability during synchronous teaching. One student wrote: "One concern though, is sometimes there is lag when the professor shares screen doing certain drawing activity." Another student shared: "sometimes online lectures ran into problems which is normal because of the unstable nature of the internet." Also, one student suggested: "Make the microphones better, I can listen to the teacher but sometimes the sound lags."

Subtheme 3.2: Hopes

Several students shared their hopes that the university would continue offering classes in the HyFlex modality in the future. One student wrote:

I feel I'm learning in the same way, or more, as taking classes in person, but I definitely feel I'm learning more than just taking online classes. The opportunity to have recorded classes is a BIG advantage for those like me, with a very tight

schedule. I will really thankful if we have the opportunity to have HyFlex classes in future.

Another student stated: "I would like to have the Hyflex classes' option to remain in the future, I feel that it was a nice experience. I also think that Hyflex classes are the future of better learning." Another student shared: "Keeping this class format would positively impact the learning of many students."

Hopes that a degree program is offered in the HyFlex mode was also expressed. One student wrote: "Please keep it permanent. Specifically, the [name of department] program." Another student suggested: "I feel that this should be offered for every class. Especially for college of technology majors, when it is assumed that we have a very busy internship or job."

Students also shared that they plan to enroll in HyFlex classes in the future. One student wrote: "I am extremely satisfied with the method this course is being taught. I plan on taking more hyflex courses in the future if possible." Another student stated: "I would hope to enroll in future hyflex class after covid-19"

Some students expressed hopes regarding the continuation of recorded lectures. One student recommends that recorded lectures should be offered in every modality, not just HyFlex. The student wrote:

> The reason I prefer Hyflex is that it gives you multiple options to attend the class, such as going to campus or taking online, but what stands out most to me is that I can always go back and watch the recording again to better understand the material. I believe all the lectures should be recorded apart from hyflex or in person mode.

Another student wrote: "Wishing the videos and resources could be accessible throughout one's life."

Summary

Six research questions guided this convergent mixed methods study. Quantitative questions 1 and 4 used descriptive statistics to gauge the students' overall satisfaction level with HyFlex classes and their perception regarding the impact of this modality on their learning. Quantitative questions 2 and 5 tested hypotheses using Mann-Whitney U test to determine whether there is a difference in overall satisfaction and perceived impact on learning between traditional and non-traditional students. Quantitative research questions 3 and 6 tested hypotheses using Spearman's correlation test. RQ3 assessed the relationship between overall satisfaction and the subscales of "HyFlex content and delivery." RQ6 explored the relationship between students' perceived impact of the HyFlex modality on learning and plans to enroll in HyFlex classes in the future. Qualitative data were obtained through the survey's three open-ended questions and were used to confirm and clarify the quantitative findings of research questions 1 and 4. The qualitative responses were analyzed using the inductive thematic analysis method.

The analyzed descriptive data indicated that most students were satisfied with the HyFlex classes and perceived the impact of this modality on their learning as positive or extremely positive. The Mann-Whitney U test revealed that the overall satisfaction with HyFlex classes and the perceived positive impact of this modality on learning were significantly higher for nontraditional students than traditional students. The Spearman's correlation test found a positive monotonic relationship between students' overall satisfaction and the six subscales of HyFlex content and delivery. Specifically, students'

overall satisfaction had the highest positive correlation with "accommodation of attendance mode" (Q17). When assessing the relationship between students' perceived impact of the HyFlex modality on their learning and their plans to enroll in HyFlex classes in the future, Spearman's correlation test revealed that there is a moderate positive correlation between these two variables.

The qualitative analysis of the three open-ended responses revealed that many students were satisfied with the HyFlex modality and perceived its impact on their learning as positive. Three major themes emerged from the qualitative thematic analysis: improved students' learning experiences and outcomes, improved student's life, and concerns and hopes.

Chapter V

Discussion, Implications and Recommendations

This convergent mixed-methods study aimed to assess students' satisfaction with HyFlex classes and explore the impact of this modality on their learning. This study also attempted to determine the differences between traditional and nontraditional students regarding their satisfaction with the HyFlex modality and their perception of its impact on their learning. A questionnaire variant was used to collect simultaneously quantitative and qualitative data for 162 undergraduate students enrolled in HyFlex classes at a college of technology in a large urban university. Quantitative data were analyzed using descriptive and inferential statistics. Qualitative data were analyzed using inductive thematic analysis.

Discussion of Quantitative Findings

The quantitative strand of this mixed-method study gauged students' overall satisfaction with the HyFlex classes and assessed the perceived impact of this modality on their learning. It also compared the differences between the traditional and the nontraditional students regarding these two variables. The study also attempted to identify quantitatively the correlation between students' overall satisfaction and the HyFlex course content and delivery six subscales and the correlation between the perceived impact of the HyFlex modality on students learning and their intention to enroll in HyFlex classes in the future.

The quantitative data analysis showed that the majority of students were satisfied with the HyFlex modality, and only 4.3% of the participants expressed dissatisfaction with it. The comparison of the traditional and nontraditional students showed that

traditional students had a lower mean rank score than nontraditional students. In other words, nontraditional students reported a higher level of satisfaction with the HyFlex modality. Also, the Mann-Whitney test showed a statistically significant difference in overall satisfaction with HyFlex classes between traditional and nontraditional students.

The quantitative data analysis revealed that almost all students perceived the impact of the HyFlex modality as having a positive impact on their learning. Only 1.8% (*n*=3) of all participants reported that HyFlex negatively impacted their learning. The comparison of the traditional and nontraditional students showed that traditional students had a lower mean rank score of the perceived impact of HyFlex modality on their learning. The nontraditional students perceived the HyFlex modality as having a more positive impact on their learning. The Mann-Whitney test also confirmed this result that showed a statistically significant difference in the perceived impact on learning between traditional and nontraditional students.

When assessing the correlation between students' overall satisfaction and the six HyFlex course content and delivery subscales, Spearman's correlation test proved a significant correlation (P-value < 0.01). Examining the correlation strength showed that the responses to Q17 (i.e., I feel that the course content is presented in ways to accommodate my attendance mode) had a strong positive correlation with the students' overall satisfaction. The second strong positive correlation was associated with the responses to Q13 (i.e., I feel that the course requirements and expectations are clearly stated) and with the responses to Q16 (i.e., I feel that the course is organized in a way for me to understand the course content). The weakest positive correlation was with Q14 (i.e., I feel that I am sufficiently challenged with assignments). These findings suggested

that the presentation of course content to accommodate students' attendance mode influences students' overall satisfaction with HyFlex classes. Also, the clarity of course requirements and expectations and how the course is organized are essential factors to students' satisfaction with HyFlex classes. Being challenged with the course assignments had little influence on students' overall satisfaction with HyFlex classes.

This study also assessed the correlation between students' perceived impact of HyFlex modality on students' learning and their intention to enroll in HyFlex classes in the future. Spearman's correlation test revealed a moderately significant correlation between these two variables, which suggested that students who perceived the impact on their learning as positive would most likely enroll in HyFlex classes in the future.

Discussion of Qualitative Findings

The qualitative strand of this mixed-methods study was meant to be supplemental to the quantitative strand. It offered further insight to the study by capturing a broader perspective on factors influencing students' satisfaction with the HyFlex classes and influencing students' perceived learning in the HyFlex modality. The inductive thematic analysis of the open-ended responses identified three overarching themes: 1) improved learning experiences and outcomes, 2) improved lifestyle, and 3) concerns and hopes.

Most students were satisfied and perceived the HyFlex modality as improving their learning experiences and outcomes. The students perceived the availability of recorded lectures as a crucial factor contributing to their learning and satisfaction with HyFlex classes as they used them as 1) a learning tool to enhance their understanding, take notes, study for an exam, and as 2) a substitute to class attendance in case they cannot attend the session. Providing attendance choices was an essential factor

that contributed to students' enhanced attendance. It also provided them with more time to study and increased their retention. Students reported that instead of missing some sessions completely, they opted to either attend it synchronously or watch the recordings later. HyFlex classes provided them with more time to study by eliminating the wasted time in commuting. The HyFlex modality contributed to increasing students' retention as students could attend class despite the barriers they faced in their personal lives. Students also felt that being in control of their own learning empowered them to learn effectively by choosing: 1) the mode that matches their learning styles and preferences, 2) the pace that matches their learning abilities to understand the course concepts and information, and 3) the time of their studying that suits their schedules and circumstances. Students also considered the HyFlex modality as aiding them in developing self-regulated learning skills. This enabled them to take more classes while improving their learning and outcomes.

Many students were satisfied and reported that the quality of their lives has improved due to the HyFlex modality. HyFlex modality enabled them to balance the demands of their college, work, family, and other obligations. As such, it decreased their personal and contextual stressors. Provided with a choice of how to attend each class session allowed them to change their mode of attendance according to their needs and preferences. The HyFlex modality eliminated several stressors such as having to drive to campus while being sick, providing care for someone, or attending to work obligations. The attendance choices reduced their stress as they could either attend the session live from wherever they are or watch the recording when they could. Some students expressed that the HyFlex classes enabled them to maintain their employment, work more hours,

and save money otherwise spent on transportation and parking. Although the online and hybrid modalities provide some of the above benefits, they fell short of providing the students with a choice of their mode, time, and place of attendance. For example, the online modality does not allow students to attend in person if they want to. The hybrid modality mandates fixed meeting location and fixed meeting times. The distinction is that HyFlex puts the students at the center and gives them total control and flexibility of how, when, and where to attend classes.

Despite students' satisfaction, some students had concerns regarding the HyFlex modality. Even though most students were satisfied with the HyFlex classes and perceived a positive impact of this modality on their learning, students raised some concerns. These concerns are related to students' characteristics and responsibilities, instructors' skills and attitudes, and the suitability of the HyFlex to class subjects and levels. For example, a few students indicated their preference for the face-to-face teaching mode. They attributed this preference to their need for direct interaction with others, their lack of self-discipline when given the flexibility in attendance, their personal learning style, or their lack of technological skills when engaging virtually. They voiced concerns about the instructors' lack of skills in teaching HyFlex courses. They shared that some instructors lacked hybrid facilitation skills, technology skills, course organization skills, and communication skills. Also, the instructor's negative attitude toward the HyFlex modality was a concern. Some instructors mandated in-person attendance and did not record their lectures. These factors negatively affected the students' satisfaction and their learning experience. Others expressed concerns regarding the suitability of the HyFlex modality for certain course subjects and levels. They reported that certain

subjects such as computer classes should be offered face to face. Some suggested that HyFlex classes are only suitable for lower-level classes.

Students have hopes regarding the future of the HyFlex modality. Many students expressed hopes for the university to continue offering HyFlex classes in the future. Some suggested that specific programs should be offered totally in HyFlex modality. Some students also expressed hopes regarding offering the recorded lectures in all classes regardless of the teaching modality.

Merging of the Findings

Ordinarily, the qualitative data in a questionnaire variant convergent mixed methods study provides supplemental information to the collected quantitative data. To fully gain the benefits of this research design approach, the researcher must integrate the findings from both the quantitative and qualitative analyses.

In this study, the quantitative results indicated that most of the students (77.7%) were either "Extremely Satisfied" or "Mostly Satisfied" with the HyFlex modality. The qualitative results confirmed this finding as most students discussed how the HyFlex modality improved their lifestyle and decreased their life stressors. The quantitative results revealed that nontraditional students were more satisfied with the HyFlex modality. The qualitative findings also explained this as many participants elaborated on how the HyFlex modality provided a work-school balance and family-school balance.

Descriptive quantitative results showed that the majority of students (82.7%) perceived the HyFlex modality as having an "extremely positive impact on their learning" or a "positive impact on their learning." This was further explained by many students sharing in their open-ended responses how the HyFlex modality contributed to

their improved learning experiences and outcomes. The quantitative analysis indicated that nontraditional students perceived the HyFlex modality as having a more positive impact on their learning. This was further explained by many students sharing how the flexible attendance mode and being in control empowered them to study effectively.

Spearman's correlation test revealed that students' perceived impact of HyFlex modality on their learning was positively correlated with students' intention to enroll in HyFlex classes in the future. These results were also supported by the qualitative findings as many students shared in their qualitative responses how the HyFlex modality impacted their learning positively, and therefore they plan to enroll in HyFlex classes in the following semesters. They also voiced their hopes for the continuation of this modality.

Integration with Previous Literature

The results of this mixed-methods study provided higher education policymakers, educational researchers, and practitioners with evidence that today's college students are satisfied with the HyFlex classes and perceive its impact on their learning as being positive. The findings of this study also add and support the limited previous studies that investigated undergraduate students' satisfaction with HyFlex classes and their performance in this teaching modality (Gobeil-Proulx, 2019; Kyei-Blankson et al., 2014; Miller et al., 2013; Rhoads, 2020)

Gobeil-Proulx (2019) examines students' perspectives regarding their experience with the comodal (HyFlex) teaching format at a Canadian French-speaking university. Gobeil-Proulx's (2019) study involved 311 undergraduates students enrolled in Comodal (HyFlex) classes at four different colleges. Data was collected using a mixed questionnaire that contained Likert scale questions and optional open-ended questions.

Findings from Gobeil-Proulx's (2019) study were in line with this study as almost

unanimously, 95% of the students reported being satisfied or somewhat satisfied with the

comodal format of teaching (HyFlex). Qualitative findings of Gobeil-Proulx's (2019)

study identified codes and themes similar to the current study: Being in control of time,

work-school balance, using class recordings as a learning tool, using class recordings as a

substitute to attendance, enhanced attendance, being in control of the place, pace and

learning preference and style, and avoid the commute.

Kyei-Blankson et al. (2014) conducted a concurrent mixed-methods study to

investigate student choice, learning experience, and satisfaction level in a HyFlex course.

The study participants were twenty-two secondary school teachers enrolled in a HyFlex

course taught over ten weeks in the winter of 2011. To collect quantitative data, the study

participants completed an online survey. For the qualitative data, they responded to a

structured interview protocol. Congruent with the findings of this study, Kyei-Blankson

et al. (2014) reported that the majority of students (95%) reported high levels of

satisfaction based on learning and knowledge construction opportunities, most students

(71%) appreciated the opportunity to blend their own learning and on a class by class

basis, and over 85% of the students planned to enroll in HyFlex courses again if given

another opportunity because of the course participation policy's flexibility.

The current study findings are also in line with Miller et al. (2013), who conducted

a mixed-methods study on 161 undergraduate students enrolled in an introduction to

statistics course offered in the HyFlex modality. The researchers compared student

satisfaction, learning, and performance of the students enrolled in the HyFlex course

section to a face-to-face section of the same course offered during the same semester. The

researchers collected the data for their study through self-reported attendance information, final grades, an end-of-semester course survey, and select focus groups. Miller et al.'s (2013) study indicated that the students appreciated the HyFlex modality, especially the flexibility of attendance and watching lecture recordings if they did not understand specific content.

Similarly, Rhoads (2020) conducted a mixed-method causal-comparative and phenomenological study to explore and investigate the impact of 16-week traditional and five-week HyFlex delivery modalities on students learning and satisfaction. Rhoads's (2020) study involved 81 students enrolled in undergraduate courses over five academic semesters. Quantitative data was collected through a Likert survey and data extraction from the institution's student information system. Qualitative data were collected through open-ended survey questions and faculty interviews. Similar to the current study's findings, most students in Rhoads's (2020) study expressed satisfaction with the HyFlex classes and perceived this modality as positively impacting their learning.

Implications for Policies and Practice

The HyFlex modality provides the students with the flexibility and convenience needed to have a balanced life and juggle the many duties that today's students experience. The findings of this study suggested that most students, especially the nontraditional ones, were delighted with the HyFlex classes and perceived this modality as positively impacting their learning.

This study adds to the existing literature. It identified factors leading to students' satisfaction and dissatisfaction with the HyFlex classes. It detected aspects in this

modality that positively impact students' learning. Based on these findings, the following implications are suggested:

1. Since most students were satisfied with the Hyflex modality, higher education institutions should offer more classes in the HyFlex modality to meet today's students' learning preferences and styles and address their needs for flexibility and convenience.

2. Higher education institutions should also identify the academic programs with a high enrollment of nontraditional students and offer a few of them in the HyFlex modality as a 4 to 5-year longitudinal pilot study. The idea is to evaluate the HyFlex modality's effectiveness in recruiting and retaining non-traditional students and assess the success and failure factors of this modality. All stakeholders, including the academic affairs office, college deans, instructors, students' representatives, supporting staff, need to work closely together from the beginning to ensure an effective and efficient roll-out of the pilot and that the courses are meeting the standards of the HyFlex modality.

3. The results of this study revealed that students in the college of technology were satisfied with the Hyflex classes and perceived the impact of this modality on their learning as being positive. However, it cannot prove that this modality is universal and can work with all subjects, academic levels, class sizes, etc. Therefore, higher education administrators should first experiment with certain subjects and academic levels before adopting this modality. This will allow determining what works and what does not.

4. To improve the quality of HyFlex classes, instructors should receive training specially designed for teaching HyFlex classes. This training should include: 1) how to design, facilitate and manage HyFlex classes, 2) how to use the necessary technology and the LMS to engage virtual and in-person students effectively.

5. Develop a culture that promotes the benefits of the HyFlex modality and its impact on students' learning and retention. This should result in instructors with a supportive attitude toward the HyFlex modality.

6. Universities should also consider the adoption of recorded lectures, regardless of the teaching modality.

Limitations

Despite the promising findings, this study had a few limitations:

1. Only a small sample size of students from one single college was included in this study. Therefore, generalizing the results can be questioned. Experts explained that statistical significance and power are gained through large enough sample sizes, sufficiently diverse to include all significant variables that impact the outcomes (Abu-Bader, 2021; Creswell, 2014).

2. The college in which this study was conducted had a high enrollment of non-traditional students. This could have contributed to the unequal sample size of traditional and nontraditional students in this study and have skewed the data distribution, which may have impacted the study results' interpretation.

3. The sample in this study was predominantly male (STEM programs). As such, it may not be representative of the general students' population.

4. The questionnaire variant used in this study may have been a limitation. Although several themes emerged from the qualitative data, the responses were short, lacked richness and depth, and were sometimes hard to interpret. Semi-structured interviews or focus groups would have been more enlightening to collect insight information.

5. The data collected from the participants were subjective and self-reported by students. It was assumed that the participants were truthful and accurate in their responses. However, self-reported data can reflect bias and inconsistent interpretation of the questions being asked of participants through the questionnaire(Creswell, 2014; Leedy & Ormrod, 2019), and

6. The study was conducted during the Covid-19 pandemic. Such a hard time may have affected the feelings/attitudes and judgments of the students and instructors. Because of the limitation imposed by the pandemic, instructors received minimum training in a short time to teach their classes using this new modality.

Recommendations for Future Research

Exploring the results of this study and reflecting on its limitations suggests the following directions for future research. Researchers are encouraged to replicate and expand this study using larger diverse samples from different programs/colleges/ universities. This will allow a broader understanding of the impact of the HyFlex modality on traditional and nontraditional students and to generalize the survey results.

Also, including additional measures such as assignments grades, exam results, and attendance logs could be valuable as it would provide objective evidence regarding

the impact of HyFlex modality on students' learning. Moreover, including semi-structured interviews and focus groups with traditional and nontraditional students could provide richer narratives. It could allow a deeper insight into how each group perceives the HyFlex modality and a thorough understanding of its impact on their learning and satisfaction.

In addition, future investigations may be conducted as longitudinal studies to examine over a period of time the effects of the HyFlex modality on traditional, nontraditional students' academic performance and their retention and graduation rates. This information would provide institutional administrators with relevant data that will help identify trends and factors associated with the retention or attrition in the HyFlex modality.

This study addressed only the students' perspectives regarding the Hyflex modality. Researchers might replicate and expand this study to include instructors teaching the Hyflex modality. Understanding their experiences and challenges when teaching using this modality might provide higher education policymakers and practitioners with a new lens of what works in the Hyflex modality and what does not and provide relevant data and information needed to make the necessary adjustments.

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Appendix A – Overview of *Research Questions*

Research Question	Data Sources	Data Analysis Method
RQ1. What is the students overall satisfaction with the HyFlex courses?	Survey item #19	Descriptive statistics: Frequencies, percentages, mean and standard deviation
RQ2. Is there a significant difference between how Nontraditional students and traditional students rate their overall satisfaction with the HyFlex modality?	Survey item #19	Inferential Statistics: Mann-Whitney U test
RQ3. Is there a correlation between the "HyFlex Content and Delivery" six items and students' overall satisfaction?	Survey items #13-19	Inferential Statistics: Spearman's correlation test
RQ4. How do students perceive the impact of HyFlex modality on their learning?	Survey item #20	Descriptive statistics: Frequencies, percentages, mean and Standard deviation
RQ5. To what extent, if any, is there a significant difference between how nontraditional and traditional students perceive the impact of the HyFlex modality on their learning?	Survey item #20	Inferential Statistics: Mann-Whitney U test
RQ6. How does perceived learning relate to students' intention to enroll in HyFlex classes in the future?	Survey items #20 & #21	Inferential Statistics: Spearman's correlation test

Appendix B - Rhoads (2020) Original Survey

Student Survey
Demographic Information

Please answer the following questions about yourself.

1. Please enter your name and email address below.

Name: _____

Email Address; _____

2. What is your age?

- o Under 18
- o 18- 24
- o 25-34
- o 35-44
- o 45-54
- o 55-64
- o 65+

3. Which race/ethnicity best describes you? (Please choose only one.)

- o American Indian or Alaskan Native
- o Asian / Pacific Islander
- o Black or African American
- o Hispanic
- o White / Caucasian
- o Multiple ethnicity / Other (please specify)_____

4. What is your gender?

- o Female
- o Male

Student Survey
Content and Delivery Questions

5. Overall, my instructors provided clear course requirements and expectations.

- o Very Successful
- o Successful
- o Moderately Successful
- o Somewhat Successful
- o Unsuccessful
- o Not Applicable, does not relate to the course, or you do not have an opinion

6. Overall, my instructors sufficiently challenged us with assignments.

- o Very Successful
- o Successful
- o Moderately Successful
- o Somewhat Successful
- o Unsuccessful
- o Not Applicable, does not relate to the course, or you do not have an opinion

7. Overall, my instructors demonstrated expertise for the subject and content.

- o Very Successful
- o Successful
- o Moderately Successful
- o Somewhat Successful
- o Unsuccessful
- o Not Applicable, does not relate to the course, or you do not have an opinion

8. Overall, my instructors provided meaningful learning activities.

- o Very Successful
- o Successful
- o Moderately Successful
- o Somewhat Successful
- o Unsuccessful
- o Not Applicable, does not relate to the course, or you do not have an opinion

9. Overall, my instructors organized the course to maximize learning.

- o Very Successful

- o Successful

- o Moderately Successful

- o Somewhat Successful

- o Unsuccessful

- o Not Applicable, does not relate to the course, or you do not have an opinion

10. Overall, my instructors used an assortment of ways to share course content.

- o Very Successful

- o Successful

- o Moderately Successful

- o Somewhat Successful

- o Unsuccessful

- o Not Applicable, does not relate to the course, or you do not have an opinion

11. Overall, my instructors provided an organized learning environment.

- o Very Successful

- o Successful

- o Moderately Successful

- o Somewhat Successful

- o Unsuccessful

- o Not Applicable, does not relate to the course, or you do not have an opinion

Student Survey

Attendance Flexibility Questions

12. How did the ability/inability to choose how to attend a course from class meeting to class meeting affect your perception of your learning in these courses? Explain

_____
_____

13. How did the ability/inability to choose how to attend a course from class meeting to class meeting affect your overall satisfaction with that course? Explain

_____
_____

Student Survey
Overall Comments

14. Any other comments about your experience with these courses you would like to share?

_____

_____

Appendix C - Modified Survey

Q1- I have read the consent information and agree to take part in the research.

○ Yes

○ No

Demographic Questions

Q2- What is your age group?

○ 18-24

○ 25-34

○ 35-44

○ 45-54

○ 55-64

○ 65+

Q3- Which of the following best describes you?

○ American Indian or Alaskan Native

○ Asian/ Pacific Islander

○ Black or African American

○ Hispanic

○ White /Caucasian

○ Multiple Ethnicity

○ Other _____

Q4- What is your gender?

○ Male

○ Female

○ Prefer not to disclose

Q5- What is your employment status?

○ Not Employed

○ Employed part-time (up to 30 hours per week)

○ Employed full-time (30+ hours per week)

Q6- What is your family status?

○ Single, never married

○ Married

○ Single parent

○ Married with children

○ Divorced

○ Widowed

Q7- What is your enrollment status?

○ Enrolled full-time (Taking at least 12 credit hours per semester)

○ Enrolled part-time (Taking less than 12 credit hours per semester)

Q8- What is your academic level?

○ Freshman

○ Sophomore

○ Junior

○ Senior

Q9- Which of the following best describes your situation?

○ I am financially dependent on my parents

○ I am financially independent (Self-supporting)

○ I am self-supporting but have help from other sources: _____

Q10- Did you receive?

○ High School Diploma

○ GED (High school equivalency diploma)

○ Other

Q11- Did you enroll in college the same year you graduated high school/received GED?

○ Yes

○ No

Q12- Did you enroll in a HyFlex course last semester?

○ Yes

○ No

HyFlex Content and Delivery: Rate your level of agreement with these statements!

Q13 Regardless of my attendance mode, I feel that the course requirements and expectations are clearly stated.

○ Strongly agree

○ Agree

○ Slightly agree

○ Slightly disagree

○ Disagree

○ Strongly disagree

Q14 Regardless of my attendance mode, I feel that I am sufficiently challenged with assignments.

○ Strongly agree

○ Agree

○ Slightly agree

○ Slightly disagree

○ Disagree

○ Strongly disagree

Q15 Regardless of my attendance mode, I feel that I am provided meaningful learning activities.

○ Strongly agree

○ Agree

○ Slightly agree

○ Slightly disagree

○ Disagree

○ Strongly disagree

Q16 Regardless of my attendance mode, I feel that the course is organized in a way for me to understand the course content.

○ Strongly agree

○ Agree

○ Slightly agree

○ Slightly disagree

○ Disagree

○ Strongly disagree

Q17 Regardless of my attendance mode, I feel that the course content is presented in ways to accommodate my attendance mode.

○ Strongly agree

○ Agree

○ Slightly agree

○ Slightly disagree

○ Disagree

○ Strongly disagree

Q18 Regardless of my attendance mode, I feel that the learning management system (Blackboard) is used effectively to present the course content.

○ Strongly agree

○ Agree

○ Slightly agree

○ Slightly disagree

○ Disagree

○ Strongly disagree

HyFlex Satisfaction and Perceived Learning

Q19 What is your overall level of satisfaction with the HyFlex course?

○ Extremely Satisfied

○ Mostly Satisfied

○ Slightly Satisfied

○ Slightly Dissatisfied

○ Mostly Dissatisfied

○ Extremely Dissatisfied

Q20 The flexibility of the attendance policy has had a/an...

    ◯ Extremely positive impact on my learning.

    ◯ Positive impact on my learning.

    ◯ Slightly positive impact on my learning.

    ◯ Slightly negative impact on my learning.

    ◯ Negative impact on my learning.

    ◯ Extremly negative impact on my learning.

Q21 Which statement do you agree with?

    ◯ I will certainly enroll in a HyFlex course in the future.

    ◯ I will probably enroll in a HyFlex course in the future.

    ◯ I don't know if I will enroll or not enroll in a HyFlex course in the future.

    ◯ I will probably not enroll in a HyFlex course in the future.

    ◯ I will certainly not enroll in a HyFlex course in the future.

Q22 By giving you the choice to attend each class session in the mode of your preference, do you feel that you are learning more, less, or the same as in other teaching formats? Explain

    _____
    _____
    _____
    _____

Q23 How does the flexibility in attendance affect your overall satisfaction with this course? Explain

    _____
    _____
    _____
    _____

Q24 Do you have more feedback about your experience with the HyFlex course format you would like to share?

    _____
    _____
    _____

Follow-up Questions

Q25- Would you be willing to participate in a 45-60 minutes interview with the researcher to further discuss your experience in the HyFlex course in exchange for a $25 Visa gift card as a compensation for your time?

○ Yes

○ No

Q26 If yes, please enter your contact information below!

○ Full Name _____

○ Email Address _____

○ Phone _____

Appendix D - Permission to use Survey

From: Rhoads, David <david.rhoads@vanguard.edu>
Sent: Friday, November 6, 2020 12:30 PM
To: Bakach, Bouchra <bbakach@Central.UH.EDU>
Subject: RE: Permission to Use Your Dissertation Survey
Bouchra,
Thanks for reaching out! Please use the survey for your research. I look forward to seeing the results of your research ☺
David Rhoads
Director of Teaching Excellence and Digital Pedagogy
Vanguard University

_____

From: Bakach, Bouchra <bbakach@Central.UH.EDU>
Sent: Friday, November 6, 2020 10:16 AM
To: Rhoads, David <david.rhoads@vanguard.edu>
Subject: Permission to Use Your Dissertation Survey

Dear Dr. Rhoads,

I am a doctoral student at the College of Education, University of Houston-Main-Campus, completing a dissertation in Instructional Technology. I am writing to ask your written permission to use the survey that you developed for your dissertation "Traditional, online, or both? A comparative study of student learning and satisfaction between traditional and HyFlex delivery modalities" in my research.

My study will assess the undergraduate students' satisfaction with the HyFlex teaching format and explore whether this modality positively impacted their learning, performance, and satisfaction. The research will present a case study of the [College name] undergraduate students at [University name]. My research is supervised by my professor, Dr. Sara G. McNeil, Associate Professor & Program Coordinator Instructional Technology. I plan to give the survey to 80-100 students. The survey will be used in its entirety or with some modified/additional questions (as needed) to suit my study better.

Please let me know that you have no objection to using your survey to finalize my research plans.

Best Regards,
Bouchra Bakach

Appendix E - Permission to Modify Survey

From: Rhoads, David <david.rhoads@vanguard.edu>
Sent: Friday, November 6, 2020 12:52 PM
To: Bakach, Bouchra <bbakach@Central.UH.EDU>
Subject: Re: Permission to Use Your Dissertation Survey

Approved :)

Get Outlook for iOS

From: Bakach, Bouchra <bbakach@Central.UH.EDU>
Sent: Friday, November 6, 2020 10:50:43 AM
To: Rhoads, David <david.rhoads@vanguard.edu>
Subject: RE: Permission to Use Your Dissertation Survey

David,

Thank you very much for allowing me to use the survey that you used in your dissertation.

Are you also allowing me to reproduce it in my dissertation appendix? The dissertation will be published in the UH Institutional Repository at https://uh-ir.tdl.org/ and deposited in the ProQuest Dissertations & Theses database.
I would like to use and reproduce your survey under the following conditions:
- I will use the survey only for my research study and will not sell or use it for any other purposes
- I will include a statement of attribution and copyright on all copies of the instrument. If you have a specific statement of attribution that you would like for me to include, please provide it in your response.
- At your request, I will send you a copy of my completed research study upon completing it. I will also provide you with a hyperlink to the final manuscript.
 If these are acceptable terms and conditions, I would appreciate it if you indicate so by replying to me through e-mail.

Best Regards,
Bouchra

Appendix F - IRB Approval

DIVISION OF RESEARCH
Institutional Review Boards

APPROVAL OF SUBMISSION

April 12, 2021

Bouchra Bakach
bbakach@uh.edu

Dear Bouchra Bakach:

On April 12, 2021, the IRB reviewed the following submission:

Type of Review:	Modification
Title of Study:	HyFlex Investigation: A Case Study of Undergraduate Students
Investigator:	Bouchra Bakach
IRB ID:	STUDY00002839
Submission ID:	MOD00003468
Funding/ Proposed Funding:	Name: Unfunded
Award ID:	None
Award Title:	
IND, IDE, or HDE:	None
Documents Reviewed:	• Survey-Consent-HRP-502e-HyFlex Investigation-April-9.pdf, Category: Consent Form; • Bouchra_Bakach_HyFlex-Investigation2_April-9, Category: IRB Protocol; • Invitation-email-HyFlex Investigation_April9.pdf, Category: Recruitment Materials;
Review Category:	Exempt
Committee Name:	Noncommittee review
IRB Coordinator:	Maria Martinez

The IRB approved the following revision on April 12, 2021.

Summary of approved modification(s):

I have communicated with the instructors the importance of the survey and the participation of the students. The instructors suggested giving students 5 extra credit points for the completion of the survey. The protocol and the supporting documents have been revised to reflect this change.

Appendix G - Invitation Email to Students

Greetings!

Since you are enrolled in a HyFlex course, I am very interested in your opinion regarding the format and content of the course. The University started offering HyFlex courses to enable students to attend each class session in the mode that suits their circumstances and preferences. Your opinion about this type of modality will help tremendously in shaping the future of course offerings.

My name is Bouchra Bakach and as a part of my doctoral dissertation, I am conducting a formal investigation to determine the students' satisfaction and perception of the HyFlex courses, I am very hopeful that the results of this investigation will offer students a more satisfying learning experience. Please share your experience and your perception of this HyFlex format as it is crucial to the university decision makers to improve the teaching environment on our campus.

The survey takes about 15 minutes to complete and your feedback will remain anonymous and confidential. Your instructor <u>WILL NOT</u> have access to your feedback, and whatever you share will have no influence on your course grade.

If you are willing to participate in this study, please click the following link:

<u>[Link removed]</u>

I would greatly appreciate your help in completing this survey and encouraging your classmates to participate in this study so that we have enough data to draw relevant conclusions. At the discretion of the instructor, you will be awarded 5 extra credit points for the completion of the survey. This study has been reviewed and approved by [University name] Institutional Review Board (IRB).

Sincerely,

Bouchra Bakach, Doctoral Candidate

Appendix H - Informed Consent

Title of research study: HyFlex Investigation: A Case Study of Undergraduate Students

Investigator: Ms. Bouchra Bakach, Doctoral candidate. The data collected is to support

her dissertation being conducted under the supervision of Dr. Sara McNeil, College of

education.

Key Information:

The following focused information is being presented to assist you in understanding the

key elements of this study, as well as the basic reasons why you may or may not wish to

consider taking part. This section is only a summary; more detailed information,

including how to contact the research team for additional information or questions,

follows within the remainder of this document under the "Detailed Information" heading.

What should I know about a research study?

- Someone will explain this research study to you.

- Taking part in the research is voluntary; whether or not you take part is up to you.

- You can choose not to take part.

- You can agree to take part and later change your mind.

- Your decision will not be held against you.

- You can ask all the questions you want before you decide, and can ask questions
  at any time during the study.

Summary:

We invite you to take part in a research study about the students' satisfaction with

HyFlex courses because you meet the following criteria: you are an adult (18 years or

older), you are a [University name] undergraduate student, and enrolled in a HyFlex

course. In general, your participation in the research involves answering a survey/questionnaire (15 minutes). If you are interested/willing to be more involved in the study, you would be interviewed by the investigator (45 - 60 minutes). You can indicate your willingness to be interviewed by the investigator when you answer the last question in the survey/questionnaire. There are no known risks to you by participating in this study. There is no compensation for completing the survey.

Detailed Information:

The following is more detailed information about this study, in addition to the information listed above.

Why is this research being done?

The purpose of this study is to determine the level of satisfaction that students have with HyFlex courses such as this course that you are taking. The study will explore whether the flexibility of attendance has an impact on the student satisfaction and perceived learning. Your feedback and participation in this study will assist in the decision making regarding the future offerings of HyFlex courses.

How long will the research last?

We expect that you will dedicate about 15 minutes to complete the survey/questionnaire.

How many people will be studied?

We expect to enroll about 100 people in this research study.

What happens if I say yes, I want to be in this research?

If you want to participate in the research, you will commit about 15 minutes to complete the survey/questionnaire, and additional 45 – 60 minutes if you volunteer for the

interview too. A link to the survey/questionnaire will be emailed to you if you are interested in participating. During this study, you will only interact with the investigator. The study is scheduled for data collection in this semester (Spring 2021), and data analysis through the summer semester. You can participate in the survey/questionnaire, and decline to participate in the interview.

What happens if I do not want to be in this research?

You can choose not to take part in the research and it will not be held against you. Choosing not to take part will involve no penalty or loss of benefit to which you are otherwise entitled. If you are a student, a decision to take part or not, or to withdraw from the research will have no effect on your grades or standing with the [University name.]

What happens if I say yes, but I change my mind later?

You can leave the research at any time and it will not be held against you. If you stop being in the research, already collected data will still be used with your permission.

Is there any way being in this study could be bad for me?

There are no known risks in your participation in this study. Also, there is no cost to you.

Will I get anything for being in this study?

The instructors at their discretion will award 5 extra credit points for the completion of the survey.

Will being in this study help me in any way?

We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include your voice being heard regarding the HyFlex teaching mode, and providing data that can help the University to improve the education experience for you and other students.

What happens to the information collected for the research?

Efforts will be made to limit the use and disclosure of your personal information, including research study, to people who have a need to review this information. Each subject's name will be paired with a code number, which will appear on all written study materials. The list pairing the subject's name to the assigned code number will be kept separate from these materials. We cannot promise complete secrecy. Organizations that may inspect and copy your information include the IRB and other representatives of this organization, as well as collaborating institutions and federal agencies that oversee human subjects' research. We may publish the results of this research. However, unless otherwise detailed in this document, we will keep your name and other identifying information confidential.

Can I be removed from the research without my OK?

The investigator is planning to use all the data collected.

Who can I talk to?

If you have questions, concerns, or complaints, or think the research has hurt you, you should talk to the research team at: bbakach@uh.edu (Ms. Bakach) and smcneil@Central.UH.EDU (Dr. McNeil).

This research has been reviewed and approved by the [University name] Institutional Review Board (IRB). You may also talk to them at (713) 743-9204 or cphs@central.uh.edu if:

- Your questions, concerns, or complaints are not being answered by the research team.

- You cannot reach the research team.

- You want to talk to someone besides the research team.

- You have questions about your rights as a research subject.

- You want to get information or provide input about this research.

I have read the consent information and agree to take part in the research.

- o Yes
- o No

Appendix I - Demographic Information of All Students

Demographic Characteristics of All Students (N=162)

Characteristics	N	%
Age		
18-24	106	65.4%
25-34	42	25.9%
35-44	8	4.9%
45-54	2	1.2%
55-64	0	0%
65+	1	0.6%
Ethnicity		
American Indian or Alaskan Native	1	0.6%
Asian/Pacific Islander	24	6.2%
Black or African American	10	50%
Hispanic	81	22.8%
White Caucasian	37	2.5%
Multiple Ethnicity	4	1.2%
Other	2	1.9%
Gender		
Male	124	76.5%
Female	37	22.8%
Prefer not to disclose	1	0.6%

Table continues

Characteristics	N	%
Employment Status		
Employed Full-Time	53	22.7%
Employed Part-Time	62	38.3%
Not Employed	47	29%
Family Status		
Single, never married	128	79%
Married	20	12.3%
Single parent	2	1.2%
Married, with Children	9	5.6%
Divorced	2	1.2%
Widowed	0	0%
College Enrollment Status		
Enrolled Full-Time	138	85.2%
Enrolled Part-time	24	14.8%
Academic Level		
Freshman	15	9.3%
Sophomore	48	29.6%
Junior	59	36.4%
senior	40	24.7%

Table continues

Characteristics	N	%
Financial Status		
Financially dependent on parents	75	46.3%
Financially independent (Self-supporting)	45	27.8%
Self-Supporting, but have help from other sources	42	25.9%
High School Diploma		
High School Diploma	153	94.4%
GED	4	2.5%
Other	5	3.1%
Enrollment into college same year of graduation		
yes	131	80.9%
No	31	19.1%