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Increasing Introverted EFL Learners' Engagement through the Flipped Classroom Instructional Model

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DEDICATION

This work is devoted to my beloved parents. I owe everything that I am to their consistent guidance and support every step of the way.

To **my beloved mother**, the most affectionate woman I know.

To **my beloved father**, the most compassionate man I know.

To my cherished sisters, whose unwavering support has been my anchor through every endeavor.

To all my brothers.

To all my friends whom I hold dear no matter where they may be, those who reside closest to my heart, those with whom I shared the bitter and the sweet.

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Lastly, this work is dedicated to all women worldwide; keep fighting!

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ABSTRACT

The quest for effective instructional methods to enhance engagement among different personality types of English as a Foreign Language (EFL) learners is crucial in today's educational landscape. Traditional classroom settings often fail to meet the specific needs of introverted learners, who may experience higher levels of anxiety and lower participation. This study investigates the potential of the flipped classroom instructional model in enhancing academic engagement levels among introverted EFL students by aligning with their cognitive preferences and educational requirements. The case study of this research involves third-year EFL students at the English department of Guelma University. Adopting a true-experimental and mixed-methods research design, the study involved both quantitative and qualitative tools. Quantitative data were collected using the University Student Engagement Inventory (USEI) and a students' questionnaire, while qualitative insights were gathered through the Myers–Briggs Type Indicator (MBTI), a personality test, and teachers' interviews. Participants were divided into experimental and control groups to compare the flipped classroom model with traditional teaching methods. The experimental group consisting of 54 students was taught using the flipped classroom method while the control group involving 57 students received traditional teaching. The findings highlight several dimensions in which the flipped classroom positively impacts academic engagement; namely, behavioral, emotional, and cognitive. The structured and preparatory nature of the flipped classroom significantly reduces anxiety and boosts participation among introverted students. Additionally, the model also benefits extroverted learners, fostering an active and interactive learning environment. Consequently, the flipped classroom emerges as a promising educational strategy, improving engagement and learning outcomes for EFL students and contributing to the advancement of language education pedagogy.

Keywords: Engagement; Extroverted EFL Learners; Flipped Classroom; Introverted EFL Learners.

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LIST OF ABBREVIATIONS AND ACRONYMS

AUSSE:	The Australian Survey of Student Engagement
CCSSE:	The Community College Survey on Student Engagement
CG:	Control group
EFL:	English as a Foreign Language
EG:	Experimental Group
EPQ:	The Eysenck Personality Questionnaire
FLN:	Flipped Learning Network
MBTI:	Myers and Briggs Type Indicator
MIT:	Massachusetts Institute of Technology
MOOCs:	Massive Open Online Courses
NSSE:	The National Survey on Student Engagement
RAPS:	The Rochester Assessment Package for Schools
SDT:	Self-Determination Theory
SEI:	The Student Engagement Instrument
SSMMD:	Self-System Model of Motivational Development
USEI:	University Student Engagement Inventory

GENERAL INTRODUCTION

1. Background

Scholars and educators have long questioned the efficacy of lecture-based teaching approaches. If the goal of education is to foster comprehension, educators must move away from rote memorization, known as surface learning, and towards deep learning, which involves active and constructive processes to build understanding (Ritchhart et al., 2011, p.7). Achieving this requires a shift from a teaching-centered paradigm to a learner-centered one. This transition involves encouraging active learning and addressing individual learning challenges to enhance student performance in student-centered activities. Given the increasing emphasis on student-centered learning (Agbatogun, 2014), educators should focus on implementing student-centered approaches, methods, and models of teaching, and integrating technology into the learning process. This shift not only equips students with modern skills but also strengthens the education system by fostering true educational reform (Overmyer, 2014). One of the most significant and recent paradigms in this reform is the flipped classroom model.

The flipped classroom model, which reverses traditional instructional methods, has proven effective in enhancing learner engagement across various learning environments (Tay, 2016). This model requires a shift in contexts, encompassing formal settings, personal spaces, and individual differences. It emphasizes learner-centered instruction, reducing conventional lecturing in favor of

active class tasks, pre- or post-class work, and online learning, and heavily incorporates technology into the learning process.

In the Algerian higher education context, this need for innovative teaching methods is particularly pressing. Traditional lecture-based approaches dominate, often neglecting the diverse needs of learners, especially introverted students who may struggle in face-to-face instruction but excel in environments that allow for reflection and independent work. The flipped classroom model, with its blend of technology and active learning, offers a promising alternative that can cater to these needs. In the age of digitalization, the flipped classroom model becomes even more relevant. It leverages technology to create more flexible and personalized learning environments, allowing introverted students to demonstrate their abilities and potential more effectively. Inverted classes, where students engage with content online before class and participate in interactive activities during class, provide a conducive environment for introverted learners to thrive. Thus, the flipped classroom not only addresses the needs of introverted learners but also aligns with the broader trend towards digitalization in education, making it a vital area of study in the context of Algerian higher education.

2. Definitions of Terms

The main terms used in this study are explained briefly as the following.

The Flipped Classroom

The concept of the flipped classroom represents a paradigm shift in educational pedagogy, constituting a form of blended learning wherein students encounter new instructional material outside the traditional classroom setting, typically at home, through pre-recorded lectures, readings, or multimedia resources. This approach stands in stark contrast to conventional teaching methods,

where instructors introduce new concepts during class time, leaving students to do application and practice independently outside of scheduled sessions. Within the flipped classroom framework, class time is repurposed to facilitate active engagement, collaborative problem-solving, and deeper exploration of subject matter through guided activities, discussions, and hands-on exercises. The flipped classroom model thus capitalizes on technological advancements and pedagogical innovations to promote more interactive, student-centered learning experiences conducive to deeper understanding and retention of course material.

Introverts Vs. Extroverts

The distinction between introversion and extroversion is a fundamental concept in personality psychology, originally proposed by Carl Jung in 1923. Extroverts are characterized by a preference for external stimuli, seeking engagement with the external world of objects, sensory experiences, and social interactions to energize and recharge. They often thrive in environments that offer frequent opportunities for interpersonal engagement, collaboration, and external validation. In contrast, introverts exhibit a predisposition towards introspection, reflection, and inward-focused cognitive processing. They derive energy and fulfillment from solitary pursuits, deep contemplation, and meaningful internal dialogues rather than external stimulation. Introverts tend to excel in tasks requiring sustained concentration, critical analysis, and independent problem-solving, valuing depth of thought and intellectual exploration over superficial social interactions. While introversion and extroversion exist on a spectrum, individuals may display varying degrees of each trait depending on situational context, genetic predisposition, and environmental influences, contributing to the rich diversity of human personality and behavior.

Student Engagement

Student engagement encompasses a multifaceted construct that encapsulates the cognitive, affective, and behavioral dimensions of learners' involvement and investment in the educational process. It transcends mere attendance or compliance with academic requirements, reflecting the depth of students' interest, curiosity, motivation, and emotional investment in their learning endeavors. Engaged students demonstrate a genuine enthusiasm for acquiring knowledge, a willingness to grapple with challenging concepts, and an intrinsic desire to actively participate in classroom activities and discussions. They exhibit a sense of ownership and autonomy in directing their learning trajectory, leveraging their intellectual curiosity and creativity to explore diverse perspectives, problem-solving strategies, and disciplinary content. Moreover, student engagement serves as a critical predictor of academic achievement, retention, and overall well-being, fostering a positive learning environment characterized by mutual respect, collaboration, and shared intellectual inquiry.

3. Statement of the Problem

In contemporary society, exhibiting sociability and assertiveness is often associated with notions of leadership and success. The prevailing narrative suggests that success, particularly among students, is often equated with verbosity and assertiveness. Unfortunately, within educational settings, there exists a pervasive tendency to prioritize and encourage extroverted behavior while inadvertently overlooking the intrinsic value of quieter, more introspective introverted individuals. Despite the acknowledgment by psychologists of the diverse spectrum of personality types exhibited by learners, such as introversion and extroversion, the educational system frequently fails to accommodate these differences effectively.

Introverted students, in particular, necessitate tailored instructional approaches that acknowledge and respect their distinct learning preferences. However, they often find themselves relegated to the periphery of educational discourse, receiving cursory advice aimed at coaxing them out of their shells rather than meaningful pedagogical support. While conventional teaching methodologies have historically addressed the challenges faced by introverted learners, the advent of constructivist teaching paradigms, particularly within tertiary education, has ushered in new opportunities for inclusivity.

Nevertheless, the contrast between introversion and extroversion remains a relatively underexplored terrain within educational research and pedagogical practice in the Algerian context. Existing literature tends to emphasize the engagement levels of extroverted students, inadvertently sidelining the needs and experiences of introverted individuals. This study seeks to redress this imbalance by focusing its inquiry predominantly on introverted learners within the context of Algerian higher education. Despite recent integrational strategies by educators, introverted students in Algeria's universities, especially in disciplines like Teaching English as a Foreign Language, continue to face significant challenges. The adoption of flipped classroom methodologies within humanities departments presents a promising approach to enhance engagement for all learners. This study, based on the researcher's firsthand experiences and observations, aims to explore the effectiveness of the flipped EFL classroom model in improving the engagement levels of introverted students.

The problem to be addressed in this research is the effectiveness of implementing flipped classroom methodologies to enhance engagement among introverted students in universities. This study aims to investigate whether the flipped classroom model can effectively cater to the

engagement levels of introverted students within the Algerian higher education system. It seeks to understand if the challenge lies in the current methods used to engage introverted learners, the successful implementation of flipped classrooms within Algerian universities, or the broader issue of awareness and acceptance of this approach despite its potential benefits. Key aspects to explore include assessing how well the flipped classroom model aligns with the learning preferences and needs of introverted students, examining practical challenges and successes in its implementation, and investigating its impact on active participation and academic performance compared to traditional teaching methods. Moreover, the research will delve into educators' and students' perceptions and readiness towards adopting flipped classroom approaches in Algeria, particularly focusing on its benefits for introverted learners. This study aims to provide valuable insights that could inform educational practices and policies aimed at better supporting the diverse needs of students in Algerian higher education.

4. Literature Review

In recent years, educational research has increasingly focused on enhancing engagement among diverse learner profiles, including introverted students, within EFL contexts. The flipped classroom instructional model has emerged as a promising pedagogical approach to address these challenges. This literature review explores the intersection of these two areas, investigating how the flipped classroom model can effectively foster engagement among learners.

Furthermore, several studies have examined the students' engagement in a flipped EFL context with regard to different skills and techniques. In this respect, it is important to review the most relevant literature among which the introverted students are the case. For instance, Noprianto (2017) deals with extrovert versus introvert students and what EFL learning strategies they use. The study consists of 58 participants who are given an introversion scale and administered an

English Language Learning Strategy Inventory (ELLSI) to see their learning strategy. The findings reveal that extroverted students use more language learning strategies than introverted students; namely, extroverted students use more affective strategies and introverts use memory strategies. Building upon Noprianto's study (2017), the current study could further investigate how these distinct learning preferences and strategies manifest in the context of a flipped classroom instructional model. By focusing on introverted EFL learners, the research could delve into whether the flipped classroom's emphasis on pre-class activities, independent learning, and interactive tasks aligns more closely with the cognitive and affective needs of introverted students compared to traditional classroom settings. Specifically, the study could explore whether introverted learners, who typically favor reflective and self-paced learning environments, exhibit increased engagement and proficiency when exposed to the flipped classroom approach.

Tuovinen et al. (2020) examine the reliability of the social engagement scale. Data collection was through the administration of a questionnaire to 862 students between 2013 and 2016 from Finnish comprehensive schools. The results demonstrate that highly socially engaged introverts have higher self-esteem than introverts who have low social engagement. Adding to Tuovinen et al.'s study, the current research could extend these findings by exploring how the flipped classroom model can serve as an effective pedagogical strategy to not only increase engagement but also bolster the self-esteem of introverted EFL learners. This study would thereby contribute to a deeper understanding of how specific instructional models can be tailored to support the psychological and educational needs of introverted students in diverse learning environments.

Chew and Ng (2021) analyze ESL learners' word contributions in a normal face-to-face situation and a synchronous online text-based environment taking into account their personality and language proficiency. After conducting a quasi-experiment with 48 Malaysian high school

students, the results show a significant difference in learners' word contributions during both online and face-to-face discussions. In online settings, introverts tend to contribute more words compared to their contributions in face-to-face interactions. Conversely, extroverts exhibit higher word contributions in face-to-face environments. Our current research could extend these findings by investigating whether the flipped classroom, which blends online pre-class activities with in-class interactive tasks, creates a balanced environment that enhances participation among introverted learners. By focusing on the specific contributions of introverted students in both online and in-person components of the flipped classroom, the research aims to determine if this instructional model effectively leverages the strengths of introverted learners, thereby increasing their overall engagement and participation.

Almusharraf and Almusharraf (2021) tackle the social presence and interaction of introverts and extroverts in an EFL online writing setting. The participants are undergraduates in a Saudi public university. Notwithstanding the investigation of the sense of community, the study reveals that engaging students in learning experiences has been significantly controlled by the instructor who, in turn, can address introverts' and extroverts' different needs. The current research could extend these findings by exploring how the flipped classroom instructional model can address the engagement needs of introverted EFL learners in Algerian universities. Almusharraf and Almusharraf found that the instructor plays a crucial role in controlling and facilitating student engagement, tailoring their approach to meet the diverse needs of both introverted and extroverted students. This study could investigate whether the flipped classroom model, which combines online pre-class activities with interactive in-class tasks, allows instructors to better support introverted students' learning preferences and increase their engagement levels.

Besides, Khodabandeh (2021) studies the effect of implementing the mind mapping technique on EFL learners' speaking skills in both conventional and flipped classes while taking into consideration learners' personality types. After conducting the experiment on 80 homogenous elementary EFL students, the findings indicate a significant difference in participants' speaking skills in pronunciation, grammar, vocabulary, fluency, and comprehension. The findings also show that introverted students benefit more in the flipped classes, while extroverts have more gains in the conventional classes. Considering these findings, our study aims to investigate whether the advantages observed for introverted students in flipped classrooms can be generalized to other aspects of their academic engagement and performance. By focusing on the specific needs and preferences of introverted learners, this research could explore how the flipped classroom model enhances their participation, reduces anxiety, and improves overall learning outcomes compared to traditional teaching methods.

Another study by Li and Li (2022) adopts a mixed-methods research approach to evaluate the impact of the flipped College English Listening and Speaking class on four-dimension learner engagement in a mainland China context. Comparing an experimental group (flipped class, N = 34) with a control group (non-flipped class, N = 35) over eight weeks, the flipped class shows higher behavioral, cognitive, and social engagement in post-tests, but emotional engagement does not significantly differ. Positive factors like the learning environment are noted, but challenges like workload and technical issues are identified. The study suggests educators need to support emotional engagement and address challenges in flipped learning for better outcomes in English instruction. In the same vein, our study aims to investigate whether the flipped classroom model can similarly enhance engagement among introverted EFL learners in the Algerian context. Specifically, it will explore if the increased behavioral, cognitive, and social engagement observed

in the Chinese context also applies to introverted Algerian students, and whether these students face similar or different challenges.

Ibrahim and Alahmed (2023) explore the impact of the flipped classroom approach on students' English learning engagement using a quasi-experimental design featuring pre- and post-tests. Female students enrolled in the Second Year at Al-Zubaida Intermediate School were randomly allocated into two groups: an experimental group with a number of 50 students who received English lessons via the flipped classroom method, and a control group with a number of 50 students who received conventional teaching. Data collection entails administering a questionnaire to evaluate student engagement within the classroom. Post-test findings unveil a statistically notable difference between the experimental and control groups. Noteworthy, students within the flipped classroom environment demonstrate elevated levels of classroom engagement during post-test evaluations. Building upon this study, our research aims to determine whether these engagement benefits observed in a general student population also apply to introverted learners in the Algerian context. By focusing on introverted EFL learners, the research will explore how the flipped classroom model can be tailored to support their unique needs, preferences, and learning styles.

An interesting study by Yan and Lv (2024) aims to create a flipped learning student engagement scale for college students, involving 450 participants. Through literature review and interviews, 21 items are designed, categorized into four components: cognitive engagement, emotional engagement for peer relationships, emotional engagement for teacher relationships, and behavioral engagement. Exploratory factor analysis accounts for 77.97% cumulative contribution variance, confirming the theoretical model's fit through confirmatory factor analysis. The scale exhibits high reliability (Cronbach's alpha coefficient: 0.959), indicating good validity and

reliability for measuring students' engagement in the flipped classroom model. The findings of this study could be compared to the findings of our research to evaluate the engagement inventory used.

Khatoon et al. (2024) explore the impact of technology on English language teaching, focusing on student engagement and language acquisition. Through surveys across various educational settings, it demonstrates that technology integration enhances learner interest, motivation, and fosters dynamic, personalized learning experiences. The study contributes to Computer-Assisted Language Learning (CALL) by offering insights into effective practices and addressing potential challenges. Similarly, our study aims to apply the principles of CALL within the flipped classroom framework to understand its effects on introverted EFL students in Algeria. By leveraging technology to deliver pre-class materials and facilitate in-class activities, the research will explore how this approach can increase engagement levels among introverted learners, who may benefit from the personalized and flexible nature of flipped learning.

A recent study by Majed and Alwadi (2024) explores the efficacy of flipped classroom pre-class assignments in enhancing student engagement in mathematics classrooms, particularly in interpreting relations between geometrical shapes. Conducted at the University of Bahrain, the research involves two cycles and employs a mixed-method approach integrating quantitative and qualitative paradigms. Instruments such as surveys, observation checklists, and oral tests are utilized to collect data. Results indicate that the introduction of the flipped classroom pre-class assignments positively impacts student engagement during the first cycle. However, in the second cycle, where group selection is controlled, no significant improvement is observed compared to the first cycle. This suggests that controlling group selection may hinder student engagement. Nonetheless, insufficient guidance on group working skills emerged as a limitation, indicating areas for improvement in future implementations. Building upon these findings, our research could

contribute to applying the flipped classroom pre-class assignment approach to the context of EFL instruction, focusing on introverted learners who may benefit from structured, individual preparatory work before class. By examining how pre-class assignments influence various dimensions of engagement, the research seeks to determine whether this method can effectively support introverted students in Algerian higher education.

Ramadoni (2023) explores the impact of students' personalities, specifically extroversion and introversion, on their conceptual understanding in calculus practicum courses using the flipped classroom. The study highlights the significance of calculus practicum in enhancing academic achievement through technology-driven learning goals. The research investigates how students' personality types influence their conceptual understanding abilities in the context of a peer-teaching flipped classroom model. Utilizing personality surveys and conceptual understanding assessments as research instruments, the study reveals that extroverted students tend to exhibit superior conceptual understanding skills compared to introverted students in this model. Activities such as creating videos and participating in class discussions have a substantial impact on extroverted students, enabling them to deepen their skills and share knowledge with peers. Adding up to this research, our study focuses on the specific needs and learning preferences of introverted EFL students examining how the flipped classroom model can be adapted to enhance their engagement and academic performance. Key areas of investigation will include the effectiveness of pre-class assignments, individual and group activities, and the role of technology in supporting introverted learners.

Birova et al.'s (2023) study explores the implementation of a flipped classroom model in EFL instruction with pre-service teachers. It investigates the impact of the flipped classroom on grammar accuracy and listening skills. The study involves 55 students from the Faculty of

Education, University of Trnava, Slovakia. The participants, 45 females and 10 males, are in their first year of undergraduate studies. The research utilizes a semi-experimental pre-test/post-test design, with control and experimental groups. The effectiveness of the flipped classroom model is assessed through two research questions focusing on grammar accuracy and listening skills. Findings indicate a statistically significant improvement in listening skills among participants in the flipped classroom. However, the impact on grammar accuracy is not statistically significant. The study highlights the importance of addressing listening skills in EFL instruction. Our study attempts to examine whether similar improvements in listening skills can be observed among introverted EFL learners, and how the flipped classroom model might be adapted to better support their specific needs.

Despite the growing evidence supporting the effectiveness of flipped classroom models in enhancing various aspects of learning, including engagement and academic performance, there remains a gap in understanding how these models specifically impact EFL learners in Algerian university contexts. While studies like Ramadoni (2023), Birova et al. (2023), and others demonstrate positive outcomes in different educational settings and subjects, the specific needs and preferences of introverted EFL learners, particularly in terms of engagement, interaction, and academic achievement, have not been sufficiently explored. This study seeks to investigate how tailored implementations of flipped classroom strategies can optimize engagement and learning outcomes for introverted EFL students in Algerian universities.

5. Research Objectives

This study aims:

- 1- To uncover the relationship between introverted EFL students' engagement and the flipped classroom model.
- 2- To investigate the extent to which introverted EFL students' engagement is enhanced through the flipped classroom paradigm.
- 3- To analyze introverted EFL students' perceptions and attitudes during their learning experience in a flipped classroom environment.

6. Research Questions

This research raises the following questions:

- 1- What kind of relationship exists between the engagement of third-year introverted EFL students at the English Department of Guelma University and the flipped classroom model?
- 2- To what extent can elements of the flipped classroom model help enhance introverted EFL students' engagement through the case study of third-year students at the English Department of Guelma University?
- 3- How do third-year introverted EFL students at the English Department of Guelma University experience and perceive inverted classes?

7. Research Hypotheses

It is hypothesized that:

- 1- Flipping the classroom in the Algerian higher education context can improve introverted EFL students' engagement to a considerable extent due to the structured aspect of the flipped classroom.

- 2- Using educational technology and individual learning in a flipped classroom context can significantly enhance the engagement of third-year introverted EFL students at the English Department of Guelma University.
- 3- Introverted EFL students in the Algerian higher education setting enjoy the flipped classroom model as it supports individual learning.

8. Research Methodology

The study includes 111 third-year English department students at Guelma University, divided into an Experimental Group (54 students) and a Control Group (57 students), with focus groups of introverted students in each. Additionally, five EFL teachers from various Algerian Universities who use the flipped classroom model are interviewed.

This research follows a mixed-method approach including tests, inventories, an experiment, a questionnaire, and interviews. Data collection and assessment tools are distributed over three stages. The following table (1) demonstrates the tools administered to collect and assess the data.

Table 1.

Tools and Participants

	Tool of research	Participants
Pre-Test	MBTI personality test	both control and experimental groups
	Engagement inventory	both control and experimental groups
Experiment	Flipped classroom experiment	experimental group only
Post-Test	Engagement inventory	both control and experimental groups
	Questionnaire	experimental group only
	Interview	teachers using the flipped classroom

Accordingly, the research methodology includes three stages: pre-test, experiment, and post-test. During the pre-test stage, the Myers-Briggs introversion/extroversion personality test, consisting of 60 items and taking 10-15 minutes, was administered to determine introverted participants. Additionally, an engagement inventory was used to measure student engagement before implementing the flipped model, considering external factors like gender. In the experiment stage, conducted with the experimental group over 12 weeks in the Oral Expression module, academic engagement in flipped versus conventional classes was compared. Out-of-class activities involved media-based self-directed learning, while in-class activities included guided discussions, practice, assessments, and collaborative work. In the post-test stage, the engagement inventory was retaken by both groups to measure post-experiment engagement. A students' questionnaire assessed the experimental group's perceptions of the flipped classroom, and semi-structured interviews with teachers were conducted to evaluate and reflect on their experience with the flipped classroom model. The study combines quantitative and qualitative methods, merging inventory and questionnaire data with personality traits categorization and teacher interviews.

9. Significance of the Study

The study's significance lies in its examination of how the flipped classroom model impacts engagement among introverted EFL students. It underscores the importance of accommodating introverted learners by integrating elements of the flipped classroom model into teaching strategies. This involves providing pre-class materials and fostering a self-paced learning environment, which aligns with introverted students' preferences for solitary learning and internal information processing.

Moreover, the findings emphasize the need for inclusive learning environments where both introverted and extroverted students can participate comfortably. By reducing the immediate

pressure to engage, the flipped classroom model creates a conducive atmosphere for students to contribute meaningfully to discussions and collaborative activities.

Educators are encouraged to promote proactive learning strategies tailored to introverted EFL students. This includes offering independent study opportunities, reinforcing word meanings through engaging exercises, and providing self-paced learning resources. By doing so, educators can support introverted learners in their academic journey while respecting their preferred learning styles and pace.

The study also highlights the role of pre-class preparation in reducing anxiety and fostering confidence among introverted students. By offering materials for review before class, educators mitigate the stress associated with immediate participation, enabling introverted students to engage more comfortably and confidently in classroom interactions.

Furthermore, the flipped classroom model demonstrates potential in enhancing engagement levels across diverse dimensions for introverted EFL students. Its adoption can lead to a more comprehensive and enriched learning experience beyond traditional teaching methods, accommodating various learning preferences and fostering deeper emotional connections to learning.

Understanding introverted students' learning preferences informs lesson planning and enhances their overall learning experience. By incorporating activities that cater to these preferences, educators can create a more supportive and inclusive environment for introverted learners, thereby transforming their attitudes toward academic engagement.

10. Structure of the Thesis

This research starts with a general introduction that consists of a background of research, a statement of the problem, a literature review of some related research, along with research

objectives, questions, and hypotheses. It also sets out the methodology and significance of the study. After the general introduction, six chapters are presented in two parts; a theoretical framework and a practical one. The theoretical part covers three chapters: Chapter One deals with the flipped classroom instructional model, Chapter Two is concerned with the introversion and extroversion personality types, and Chapter Three focuses on EFL learners' academic engagement. At the same time, part two of the thesis includes chapters four, five, and six. Chapter four describes the research methodology and design, while Chapter Five comprises data presentation and analysis. Furthermore, Chapter Six is devoted to the findings and discussions before providing implications and limitations. A general conclusion follows the last chapter of the thesis.

CHAPTER 1:

THE FLIPPED CLASSROOM INSTRUCTIONAL MODEL

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Introduction

Recent developments in technology and psychology have opened up completely new fields of study for education research. Increased pressure from rising tuition expenses and the availability of free online courses is sparking discussion and bringing about change in the actual classroom. This discussion revolves around the flipped classroom (Bergmann & Sams, 2012). This chapter discusses the notion of teaching and learning concerning the implementation of different teaching methods and learning autonomy. Moreover, it illuminates the widespread interest in the flipped classroom since its inception and throughout recent years, thereby initiating discussions on its historical evolution and advancement as an instructional paradigm. The Khan Academy and the Massachusetts Institute of Technology mark pivotal milestones in the narrative of the flipped classroom's evolution. Furthermore, to delineate the flipped classroom, it is imperative to commence by defining blended learning comprehensively, including its various forms and frameworks, before delving into the specifics of the flipped classroom model. Accordingly, the definition of the flipped classroom is elucidated meticulously and from diverse perspectives, encompassing various models of the flipped classroom and elucidating its distinctions from conventional lecture-based approaches. Moreover, the implementation of the flipped classroom is tackled by mentioning course content and activities step by step. Finally, this chapter concludes with the benefits and challenges of this instructional model.

1.1. Teaching and learning

The notion of learning is constantly evolving, especially as more and more teaching and learning techniques are used to support student learning and autonomy. This is seen from the continuous emphasis on educational policy, which places a strong emphasis on making sure that

both students and teachers have access to the best tools for enabling communication (Al-Samarraie & Saeed, 2018).

One of the key elements influencing learning in educational institutions is the teachers. The quality of the educational practice is influenced by several elements, mainly the professional development of instructors. Through experience and involvement in formal and informal training, teachers continuously improve their practices. The development of teachers' pedagogical knowledge as well as their scientific knowledge is essential. It has been demonstrated that theoretical presentation combined with practical demonstration, exercise, and feedback is the most effective way to educate instructors (Panteliadou & Patsiodimou, 2000). Training becomes a requirement for adapting both the learning and teaching techniques and the content in the setting of evolving technological circumstances (Vitsilaki, 2002). As a result, the role of the teacher is altered to include assisting in creating an environment at the University that encourages students' creativity, critical thinking, intelligence, and psychological preparation.

Giving instructors the necessary pedagogical and technical background, as well as practice and expertise in the design and assessment of new instructional models, is one of the main objectives of teacher training. A recent attempt to define the fundamental components of the educational process is the learning design theory. Learning activities that are "pedagogically informed" and "effectively utilize relevant tools and resources" are referred to as "learning designs" (Fill et al., 2008). Learning objectives, who performs what (and when), how tools and resources are used, and the results are all described in a learning design. The goal of the area of learning design is to define the "process" of education, which refers to the sequences of activities that are frequently central to small group instruction and are led by an educator (Dalziel, 2007).

In this regard, and due to technological advancements and the emergence of student-centered learning settings, the flipped classroom has gained significant attention from researchers and the teaching community becoming an increasingly popular teaching model (Bergmann & Sams, 2012; Chen et al., 2014; Howitt & Pegrum, 2015; Kim et al., 2014; Lai & Hwang, 2016; Tucker, 2012). The instructor is the central focus of conventional teaching methods, and learners passively receive knowledge in a single direction from teacher to student (Flumerfelt & Green, 2013; Sahin et al., 2015).

Teachers are unable to attend to students who study at varying rates or various levels since, during lectures, all students are receiving knowledge simultaneously. To provide more time for in-class activities, flipped classrooms put the focus on the students and promote class preparation (Goodwin & Miller, 2013). This method takes into consideration learners' differences at various levels, encourages interaction, and helps students develop higher-level cognitive abilities (Bergmann & Sams, 2012; Chen & Chen, 2015).

1.2. The Buzz Around the Flipped Classroom

The flipped classroom is the subject of substantial discussions in academic circles across all levels. These primarily take the form of internet blogs and newspaper pieces, especially those with an academic focus. Complete websites dedicated to promoting the flipped classroom philosophy are beginning to appear, in addition to news items and blog postings. Websites and articles with commercial content are merely a small portion of the internet buzz around the flipped classroom. Many companies have also started advertising resources to aid teachers who want to use the flipped approach in their classrooms. The primary goal of these is to offer tools for producing screencasts and educational films similar to the Khan Academy style. Some organizations even issue credentials for "Certified" flipped classroom educators (Novak, 2011).

The development and adoption of MOOCs was one of the most recent advancements in education. Massive Open Online Courses became a popular term in the educational community. Despite adopting technology in other areas of life, instructors still do not completely utilize it. Considering the shift in students' learning styles and preferences, the majority of institutions still favor conventional teaching approaches. Online and in-person instruction are both used in blended learning. Learning might be depicted as a continuum, with face-to-face instruction without the use of technology on one end, and fully online, or distance, learning with the significant use of technology on the other. The center of this continuum is where blended learning fits. Flipping the classroom is one of the blended learning delivery methods that suggest substantial use of technology but also includes a face-to-face teaching component. Flipped classrooms have recently gained a lot of popularity as a method of integrating technology into education (Bernard et al., 2014).

The increasing focus on the concept of the flipped classroom is challenging to overlook. It was initially enthusiastically accepted and effectively implemented by the educational communities in America and Europe before increasingly being taken into consideration in studies at other institutions worldwide. The approach has been the topic of several recent papers and is even listed as one of the "major innovations in educational technology for higher education" in the 2015 Horizon Report for Higher Education (Al-Samarraie et al., 2020; Murray et al., 2014; Ritzhaupt & Sommer, 2018)

1.3. The History and Development of the Flipped Classroom

Two interconnected movements are working together to transform education. The first of these is technological advancement. This technological revolution has made it possible to multiply and duplicate information for a low price. It commenced in the 15th century with the creation of

the printing press and has progressed continuously since. Electronic telegraphy surfaced during the 1830s, succeeded by wireless radio in the late 1800s and early 1900s, the introduction of television in the 1920s, the development of computers in the 1940s, the inception of the internet in the 1960s, and the emergence of the World Wide Web in the 1990s. As these technologies gained popularity, the ideologies that were transmitted via their channels gave rise to a second movement. This intellectual movement aims to eliminate the fabricated, man-made barriers, as opposed to the technological movement, which attempted to remove real, physical obstacles to the unrestricted flow of information. The free software movement, though it is unquestionably not only about software, serves as an example of this (Stallman & Lessig, 2010).

The encyclopedia provides an excellent illustration of the previously mentioned phenomenon. Since over 250 years ago (Britannica, 2012), Encyclopedia Britannica has been continuously published (since 1768). Even though Encyclopedia Britannica content has been accessible online since 1981, open access to encyclopedic knowledge has not been widely available to users until the establishment of Wikipedia in 2001. Wikipedia is free to all users, and the site receives over 2.7 billion US page views each month. In contrast, access to Encyclopedia Britannica is still only available to a small number of paying customers. Therefore, despite the availability of technology and digital content to give open access to encyclopedic content, this was not possible due to ideological barriers. Only once these notions were dispelled was humanity enabled to produce what is now the biggest, most recent encyclopedia on the planet (Wikipedia, 2012).

Similar to this, we are starting to observe how these two movements together are impacting higher education. There have been considerable advancements in research in the technological field. Video lectures perform (slightly) better than in-person lectures, while interactive online videos do even better (Effect size=0.5), according to studies (Cohen et al., 1981). Both online and

traditional homework are equally successful, and carefully designed intelligent tutoring programs have been proven to be equally effective as human tutors. Despite these developments, adoption has been slow since creating effective educational systems can be quite expensive. However, these financial constraints are being overcome by the corresponding ideological revolution.

When MIT (Massachusetts Institute of Technology) unveiled its OpenCourseWare (OCW) initiative in 2001, it marked a significant advancement in MIT's ideologies (MIT, 2012). This allowed for access to data that was previously exclusively available to students who paid for college tuition, which at MIT is more than \$40,000 per year (MIT, 2012). Salman Khan, an MIT alum who started the Khan Academy in 2006 and launched a collection of over 3200 videos and 350 practice problems in 2012, is continuing this trend. The Khan Academy's declared goal is to provide free, world-class education to anyone, anywhere, in 2012. Sebastian Thrun and Andrew Ng, Stanford professors, expanded enrollment to their online classes in the fall of 2011, inspired by Khan's initiatives. Over 160,000 students enrolled in Thrun and Peter Norvig's free online course on artificial intelligence. After leaving the university, Thrun started Udacity, which offers many free courses. Ng also launched Coursera, his own free online education project, with assistance from Stanford. The Coursera alliance has added Princeton, Pennsylvania State University, and the University of Michigan with the purpose of increasing the total number of courses it offers. Additionally, MIT has improved its open educational program and partnered with Harvard on edX, a \$60 million project. This project offers free online classes from Harvard and MIT (Uzunboylu & Karagozlu, 2015).

While brick-and-mortar university tuition is rising quickly, online education is developing, expanding, and becoming widely accessible for free (National Center for Educational Statistics, 2012). Since 2000, the cost of attending a University of California institution has roughly tripled.

Naturally, this is not being well accepted by California university students (Asimov, 2012). Similar to how students in Quebec actively oppose anticipated tuition increases, students at Rutgers University disrupted a board meeting on June 20, 2012, to voice their opposition to proposed tuition increases (Heyboer, 2012). A study by Gillen et al. (2011) feeds the flames by showing that research funding is supported by undergraduate student tuition. Consequently, the question of what students are getting for their money is one both students and educational institutions naturally ask. Therefore, a certain pressure is applied to educational institutions in order to enhance and develop the in-person educational experience of their students.

Higher performance standards from educational institutions are demanded by more than just students. Additional pressure is coming from organizations that provide accreditation for these educational institutions. University graduates in engineering and technology must complete specific requirements in order for their degrees to be certified, according to the Accreditation Board for Engineering and Technology (ABET) in particular (Accreditation Board for Engineering and Technology, 2009). These requirements sometimes referred to as outcomes 3a-k, include the abilities to communicate effectively, recognize, create, and solve engineering challenges, and perform in multidisciplinary teams. Effectively teaching and assessing several of these criteria using instructive lectures and closed-ended questions is often challenging.

However, problem-based learning strategies can be a lot more successful in achieving these objectives. According to studies by Felder and Brent (2003), ABET 3a-k outcomes may be achieved by problem-based learning techniques. However, because the curriculum for engineering degrees is already overloaded, the adoption of problem-based learning is difficult. It might seem hard to squeeze any more content into these programs. Although computer technology is at least partially to blame for the unpleasant predicament that educational institutions are in, it may also

play a significant role in the solution. Man has employed tools to increase the efficacy and efficiency of his labors since the Stone Age.

In contemporary industry, this is achieved by automating processes that can be automated and concentrating human effort on tasks that cannot. While group lectures have been harshly condemned in certain educational literature, there does not appear to be any data to back up these concerns. However, allocating student and instructor time for in-person lectures is debatable, given that online lectures are just as practical as in-person lectures in imparting fundamental knowledge (Cohen et al., 1981; Zhang et al., 2006). Instead, pre-recorded lectures can be given to students as homework, freeing up class time for interactive learning activities that cannot be automated or programmed. The flipped classroom, which is quickly becoming a new term in educational circles, is based on this fundamental idea.

Although it did not have a name at the time, the flipped teaching approach has been employed throughout history. Professors discussed the readings in class and gave homework assignments, particularly for literature-based courses. The search for teaching strategies that emphasize active and student-centered learning began in earnest during the late 1990s among a number of educators. One of the first teachers to use flipped teaching was Dr. Erik Mazur, who is recognized for peer instruction (Mazur, 2013). According to Lage et al. (2000), there is a disconnect between the conventional teaching approach employed by teachers and students' diverse learning styles, including experiential learning, project-based learning, group work, and self-directed learning. Nevertheless, it was difficult to balance the course material while including alternative instructional strategies to accommodate students' various learning styles because doing this required more class time. Dr. J. W. Baker (2016) created a teaching approach that involved giving lecture material as homework and using class time to assist students in comprehending the content.

The emergence of a new teaching approach was made possible by advancements in educational technology at the time, including access to multimedia and faculty members' ease in developing multimedia. The terms "Inverted Classroom" and "Classroom Flip" were created by Lage et al. and Baker (2002; 2016), respectively. The lectures in this newly discovered mode of instruction were held outside the classroom, and the students used their newly acquired knowledge to engage in activities to further their comprehension of the subjects (Al-Samarraie et al., 2020). This teaching approach was enhanced by the use of educational technology, although it was not the only factor. A few of the significant elements that had great potential for engaging students in learning and fostering pedagogical reforms were the advent of computers in the 1980s, the expansion of the internet in the 1990s, and the emergence of multimedia technology shortly after including learning management systems like Blackboard and WebCT.

Furthermore, to reach and further develop concepts for their students, Jonathan Bergmann and Aaron Sams (2012) began recording their chemistry lectures in the middle of the 2000s and posting them on YouTube. They then made it a requirement for their students to watch the videos prior to class. Students benefitted from improved preparation and interactions that sparked more in-depth conversations as a result. Both students and teachers reported having a better overall classroom experience. Salman Khan (Khan Academy) uploaded YouTube videos to teach his young family members mathematics at the same time. Tens of thousands of pupils every month were seeing these videos. His method of instruction was so well-liked that it gave rise to the nonprofit Khan Academy, which offers all students free courses.

1.4. The Definition of the Flipped Classroom

The flipped classroom represents a technology-infused pedagogical approach gaining prominence within the realm of blended learning methodologies (Rahman et al., 2019). Before

moving to the definition of the flipped classroom, we ought to give an overview description of blended learning and its types.

1.4.1. Blended Learning

Many authors have given their own definitions of blended learning. According to Graham et al. (2005), three models characterize blended learning. The first one is the integration of diverse instructional modalities or delivery mediums, the second is the fusion of traditional face-to-face instruction with computer-mediated learning, and the third is the amalgamation of diverse pedagogical approaches. Similar viewpoints are presented in Driscoll's (2002) definition of blended learning. According to her, four different kinds of mixes can be made: (a) combining web-based technology to accomplish an instructional objective; (b) combining pedagogical methods and approaches to deliver the most effective learning outcomes with or without the use of educational technology; (c) combining any type of instructional technology with in-person instructor-led training, and (d) combining educational technology with vocational activities (learning and working).

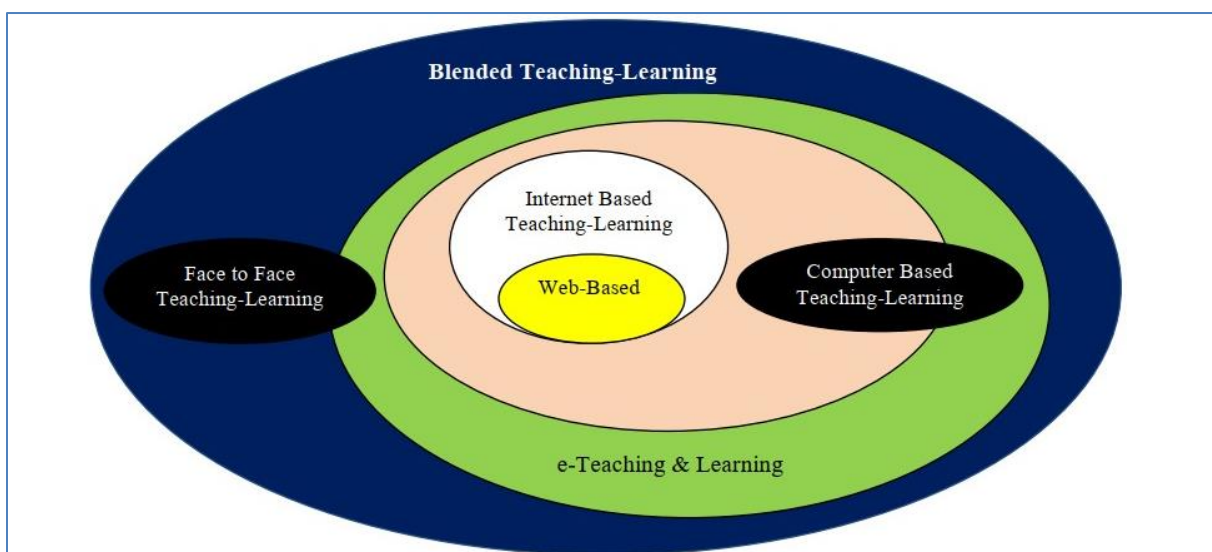
The definition that refers to combining online and offline learning is the one that is most frequently used from these definitions. According to a number of authors, blended learning combines or integrates the benefits of both conventional classroom instruction and online teaching or computer-mediated instruction, such as the use of technology to facilitate interactions between learners, teachers, and learning materials (Bliuc et al., 2007; Garrison & Kanuka, 2004; Graham, 2006; Osguthorpe & Graham, 2003; Watson, 2008).

It is unclear how this blending must take place. Some researchers use percentages to describe this blend (Allen et al., 2007; Bernard et al., 2014). For instance, between 30 % and 79 % of the content in blended courses is presented online (Allen et al., 2007). The problem, according

to Garrison and Kanuka (2004), is not monitoring how much time is spent in person or online but rather effectively integrating the two key elements so that it is not only adding on to the existing dominant method or approach. Figure 1 demonstrates the different components that can be included in a blended learning and teaching approach.

Figure 1.

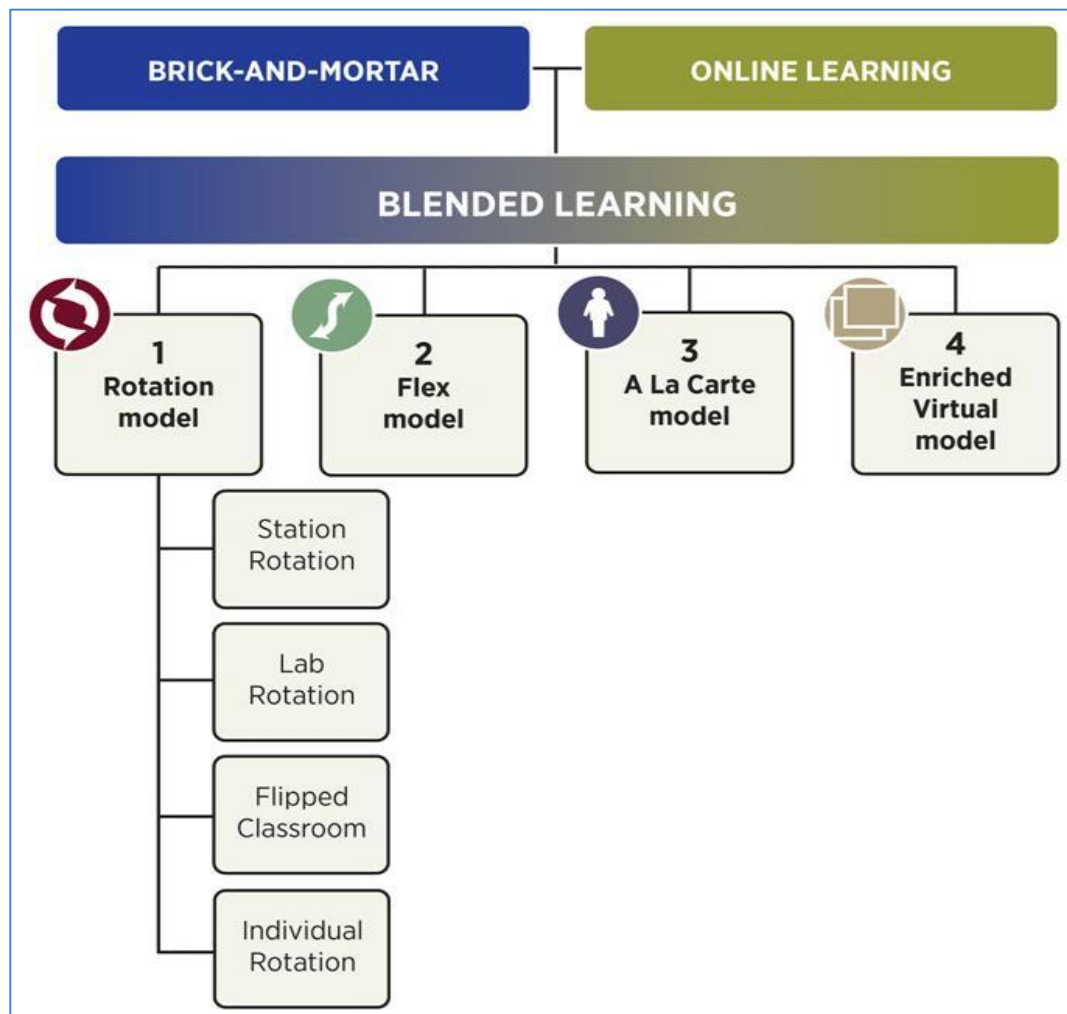
Components of Blended Learning



Note. These components were demonstrated by Hadjerrouit (2008)

1.4.2. Blended Learning Models

There are several ways to implement blended learning. Adaptive study tools and resources help the blended teaching-learning models by enabling teachers to match the appropriate student with the right content at the right time (Powell et al., 2015).

Figure 2.*Blended Learning Models*

Note. These blending learning models were demonstrated by Staker and Horn (2012)

As demonstrated in Figure 2, the majority of blended learning methods resemble one of the four types (Staker & Horn, 2012). These include Enriched-Virtual Model, Self-Blend Model, Flex Model, and Rotation Model. Four further sub-models may be created from the rotation model: the station rotation model, the lab rotation model, the flipped classroom model, and the individual rotation model (Staker & Horn, 2012). The teacher should choose the blended learning model according to students' level of comprehension and the content to be learned in order to achieve

effective learning. Greater freedom in choosing any model by position and pace has been given to the instructor. The main focus of this study will be on the Rotation Model.

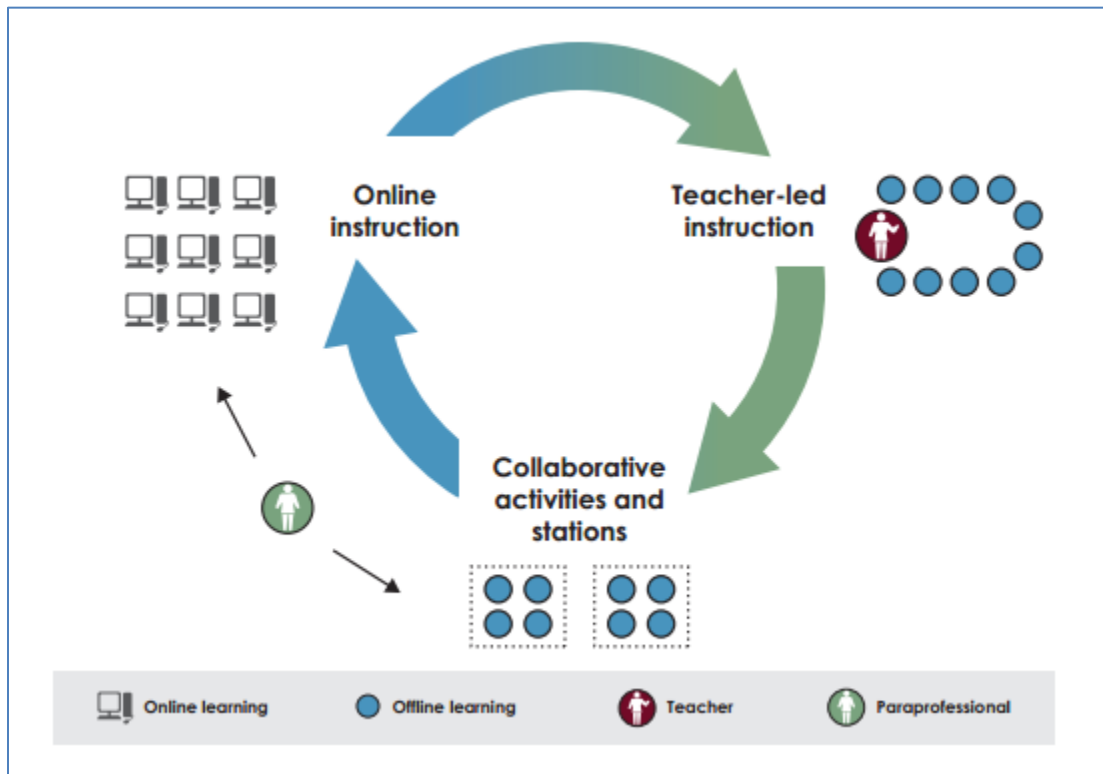
1.4.2.1. Rotation Model

Based on a predetermined timetable or of their choice, the students are required to rotate between different learning modes while they are online, which is at least one of the modes for online education. Other methods of learning include tutoring, community service, small-group instruction, large-group instruction, and handwriting exercises. With this sort of model, the majority of the classes are delivered on campus rather than online. It contains the four following models (Staker & Horn, 2012).

1.4.2.1.1. Station Rotation Model

In this model, students are exposed to many learning stations in a classroom. Students could start with instructor preparation, and then move on to assignments and interactive activities with other students, before returning to computers or tablets for online education (Staker & Horn, 2012).

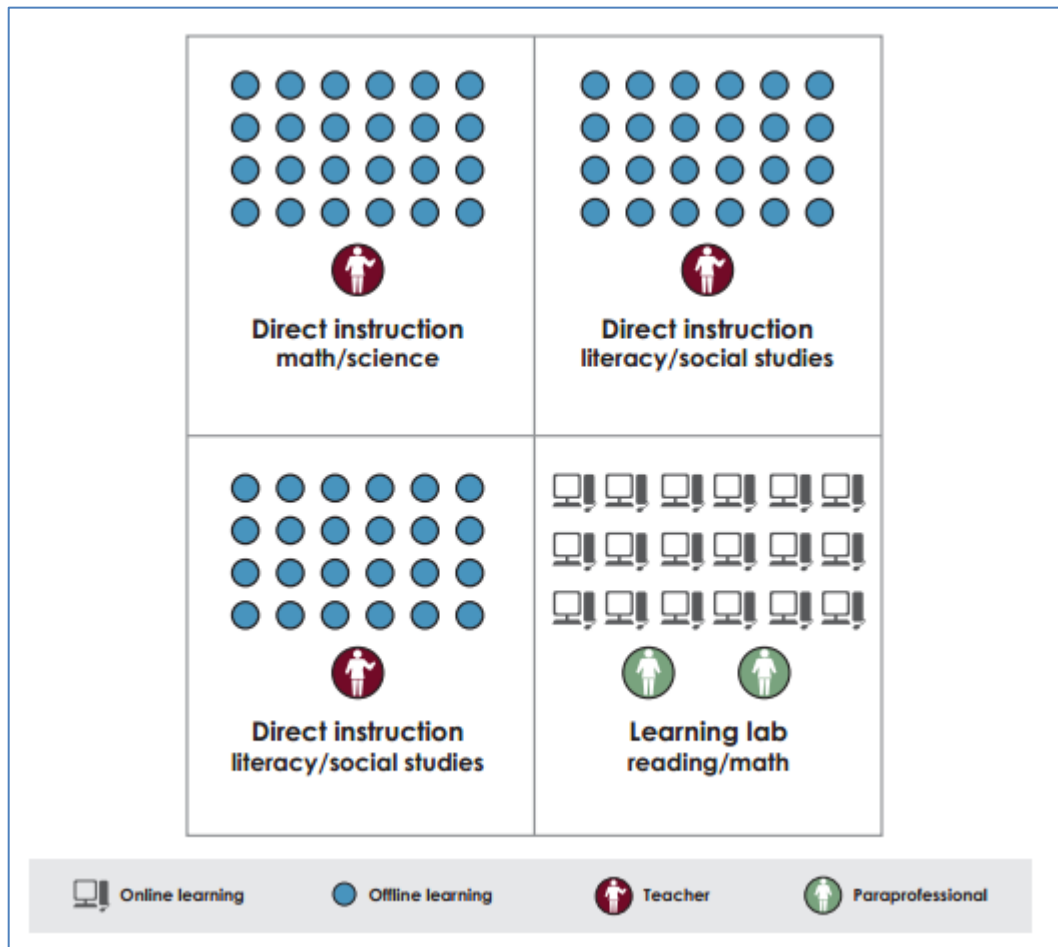
The following Figure 3 represents the station rotation model:

Figure 3.*Station Rotation Model*

Note. Adopted from Staker and Horn (2012)

1.4.2.1.2. Lab Rotation Model

This model is similar to the station rotation model, except for the fact that students in this model rotate out to the learning laboratory for online instruction rather than being sent to a training laboratory for all learning activities (even those that took place online). Students are transported from classroom settings to a learning lab equipped with a variety of electronic devices, including PCs, laptops, tablets, and iPads (Staker & Horn, 2012). The following figure 4 shows this model.

Figure 4.*Lab Rotation Model*

Note. Adopted from Staker and Horn (2012)

1.4.2.1.3. Flipped Classroom Model

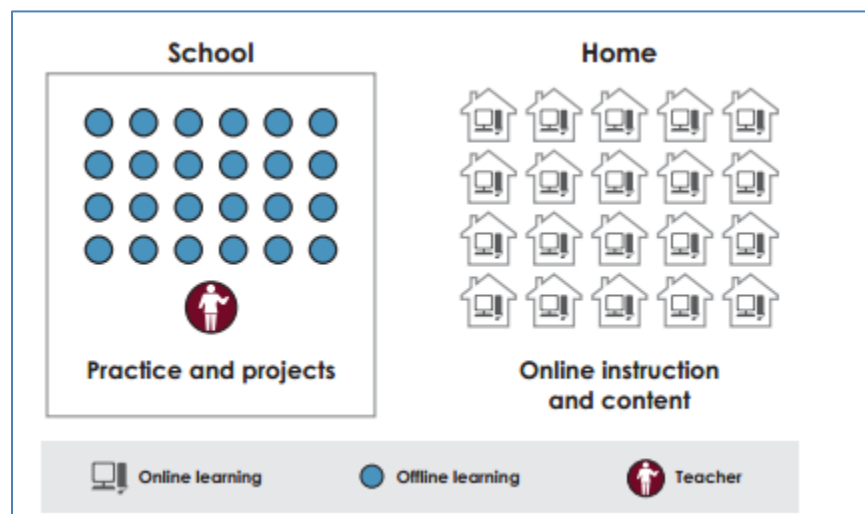
The flipped classroom model constitutes a form of rotation wherein students access subject matter online, primarily via the Internet, and subsequently engage in self-paced independent study beyond the classroom environment, typically in their own homes. The next day, the teacher's activities and practice throughout class reinforce the previous experience. The flipped classroom paradigm is more consistent with the idea of mixed teaching-learning, which promotes student

autonomy over time, place, direction, and speed. Students may pick where they want to do their online studying and can set the rate at which they access that information (Staker & Horn, 2012).

Figure 5 shows the representation of this model.

Figure 5.

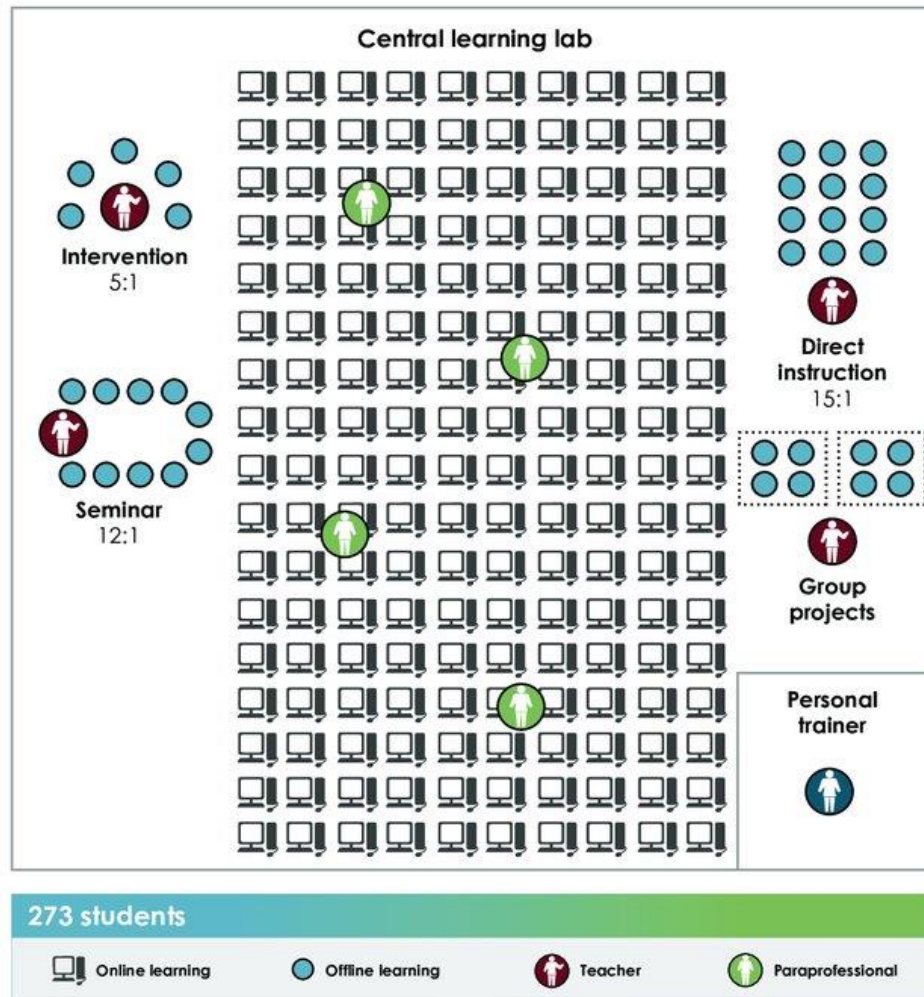
Flipped Classroom Model



Note. Adopted from Staker and Horn (2012)

1.4.2.1.4. Individual Rotation Model

Each student receives a customized rotation schedule based on their requirements, with at least one of them being online instruction. In general, the rotating model does not differ from other modes in the sense that not all students rotate through each station or modality. For instance, some students start off with direct instruction from the teacher before being directed to an online learning lab. On the other hand, some students are told by their teachers to just practice what they have learned before moving on to the online study lab (Staker & Horn, 2012). This model may be seen in Figure 6.

Figure 6.*Individual Rotation Model*

Note. Adopted from Staker and Horn (2012)

1.4.2.2. Other Blended Learning Models

In addition to the aforementioned types of blended learning, the flex model is an online learning program that takes place during school hours. It facilitates students' access to online training and materials with the support of teachers on-site. Furthermore, the A La Carte model (self-blend model) encourages students to choose the online courses to supplement their classroom

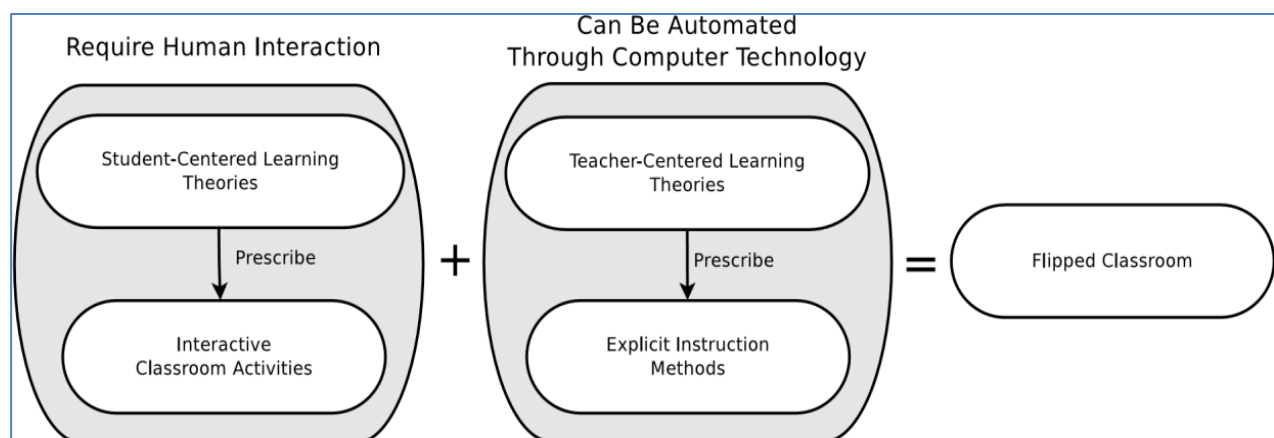
instruction. The official teacher in this case is the online instructor. Students can enroll from either the school's main campus or a distant location (home). Finally, the enriched virtual model provides students with a full school experience divided into attending class and studying remotely (typically at home) in addition to online guidance and information. Many enhanced virtual programs began as full-time online schools then transformed into blended programs to provide students access to traditional brick-and-mortar education. The enhanced virtual model is distinct because students do not attend classes daily, and online courses are not offered as optional (Staker & Horn, 2012).

1.4.3. Defining the Flipped Classroom

In scholarly literature, various definitions of the flipped classroom exist. This educational model, characterized by its student-centered approach, comprises two essential components: in-class interactive learning activities, and out-of-class individual instruction solely based on technological devices like computers (Bishop & Verleger, 2013). It was described by November and Mull (2012) as an approach where students get ready for the class by viewing videos, reading articles, and listening to podcasts. Figure 7 provides a visual depiction of this definition.

Figure 7.

The Flipped Classroom



Note. This design was suggested by Bishop and Verleger (2013)

Milman (2012) asserts that this approach endeavors to enhance course effectiveness by disseminating knowledge to students through videos, podcasts, discussions, group activities, and applications during the course period. Conversely, Hamdan et al. (2013) contend that the flipped classroom is not a fixed model; instead, it is a framework instructors employ to address diverse student needs by employing a range of tools. Furthermore, the flipped classroom method improves active learning activities and allows students the chance to apply their knowledge in a classroom setting under the supervision of the teacher (Toto & Nguyen, 2009). The flipped classroom concept was changed to the flipped classroom approach since educators in different nations use the flipped classroom in a variety of ways. The Flipped Learning Network-FLN (2014) underscores the versatility of this innovative approach, which can be implemented using various instructional methods. Extensive scholarly inquiry investigates the application of the flipped classroom model across diverse domains, such as healthcare education (Critz & Knight, 2013; Ferreri & O'Connor, 2013; Pluta et al., 2013), science (Bates & Galloway, 2012; Kenna, 2014; Kettle, 2013), and mathematics (Love et al., 2013).

The flipped classroom approach is defined simply as what is done at school being done at home, and homework to be completed at home is done in class (Bergmann & Sams, 2014). In this approach, students study the theoretical aspect of the course material in advance using a variety of tools, including internet videos, presentations, and learning platforms. They take notes and prepare questions on the material they cannot grasp (Kim et al., 2014). Throughout the in-class lesson, learners do support tasks including group work, problem-solving, interpreting results, and answering the questions they prepared before the class (Formica et al., 2010). The approach that is known as the flipped classroom shifts learning responsibilities from the teacher to the student (Bergmann et al., 2011).

1.4.3.1. The Flipped Classroom Models

Different models are available for the adoption of the flipped classroom concept. The effectiveness of these models can be maximized by considering the specific classroom context during their selection (Bajunury, 2014).

1.4.3.1.1. Traditional Flipped Classroom Model

The traditional flipped classroom model was defined by Bergmann and Sams (2012) as what is done at school being done at home, and homework to be completed at home is done in class. Students see the lecture video from the previous night before class in the usual flipped classroom manner. When they get in class, short questions and answers open the lesson. If anything in the lecture is not understood, the teacher thoroughly explains it. During the remaining time, the teacher designs exercises based on inquiry and provides individualized support to each student. Lessons are always provided outside of class time in lecture video format. In the flipped classroom approach, students are given the chance to learn through discussion, making it a student-centered approach instead of a teacher-centered one. The teacher acts as a guide rather than leading the class. This approach rearranges the use of time in the classroom compared to the traditional approach where most of the course time is dedicated to teaching the subject (Bergmann & Sams, 2012).

Table 2.

In-Class Activities in Traditional and Flipped Classrooms

Traditional Classroom	Time	Flipped classroom	Time
Warm-up	5 min	Warm-up	5 min
Homework checking of the previous lesson	20 min	Answering lecture video questions	10 min
Teaching of new subject	30-45 min	-	-
Exercises or laboratory applications	20-35 min	Exercises or laboratory applications	75 min

Note. Table 2 shows the duration of difference class in the flipped classroom approach and the traditional approach as suggested by Bergmann and Sams (2012).

1.4.3.1.2. The Partial Flipped Classroom Model

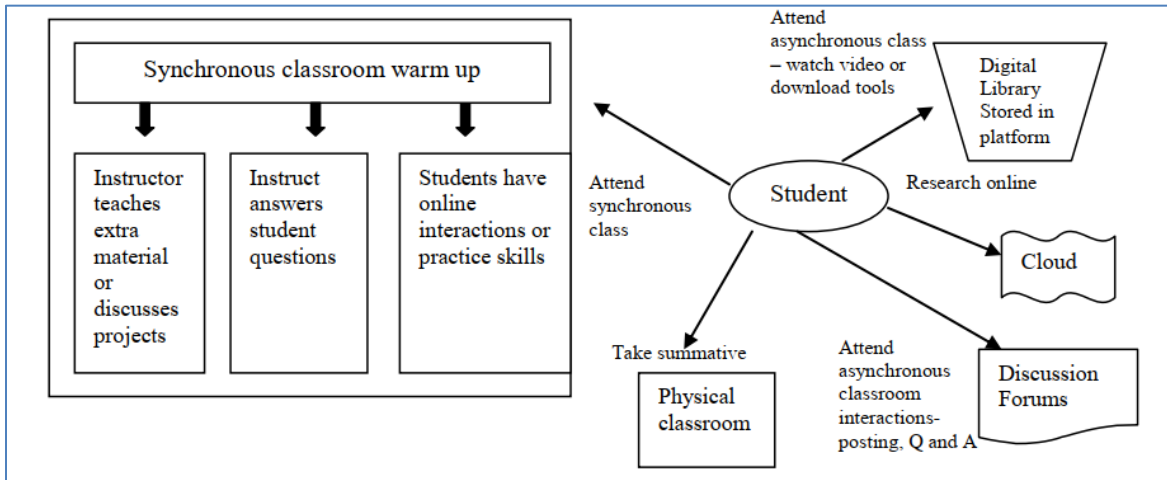
The Partial Flipped Classroom Approach Model is a less rigid version of the traditional flipped classroom model (Bajunury, 2014). Gwyneth Jones successfully implemented this approach at Murray Hill Secondary School, where she encouraged but did not require students to watch videos outside of class time and did not penalize those who could not due to lack of equipment (Springen, 2013). While Jones referred to his method as a flipped classroom, it is a part of the traditional flipped classroom model developed by Sams and Bergman (2012).

1.4.3.1.3. Holistic Flipped Classroom Model

Chen, et al. (2014) added three elements (Progressive Activities, Engaging Experiences, and Diversified Platforms) to the traditional four elements of the flipped classroom approach (Flexible Environments, Learning Culture, Intentional Content, and Professional Educators) to create the Holistic Flipped Classroom (HFC) model. The HFC model incorporates the physical classroom, the home environment, and mobile devices, making all learning spaces equally important. Unlike traditional flipped classrooms, all learning spaces in the HFC model are monitored and supported, allowing students to preview/review course lectures, participate in synchronous class sessions, communicate with instructors and classmates, and reflect on their learning experiences. All activities are recorded in the platform's system log for analysis. Before each synchronous class, students can watch lessons and review materials in a mobile or cloud-based environment. In the synchronous classroom, the instructor can guide students through hands-on activities, such as conducting research, submitting reports, and taking quizzes. Figure 8 illustrates the workings of the HFC model.

Figure 8.

Holistic Flipped Classroom Model



Note. This HFC model was proposed by Chen et al. (2014).

1.4.3.2. Conventional Teaching and Teaching via the Flipped Classroom

The flipped classroom approach is an innovative way of teaching that turns conventional methods upside-down. Instead of traditional teaching approaches, the focus is on student-centered learning, supported by technology, that encourages students to construct their own knowledge, collaborate with their peers, and deepen their understanding. Figures 9 and 10 provide a clear demonstration between the conventional and flipped classrooms.

Figure 9.

Conventional versus Flipped Classrooms

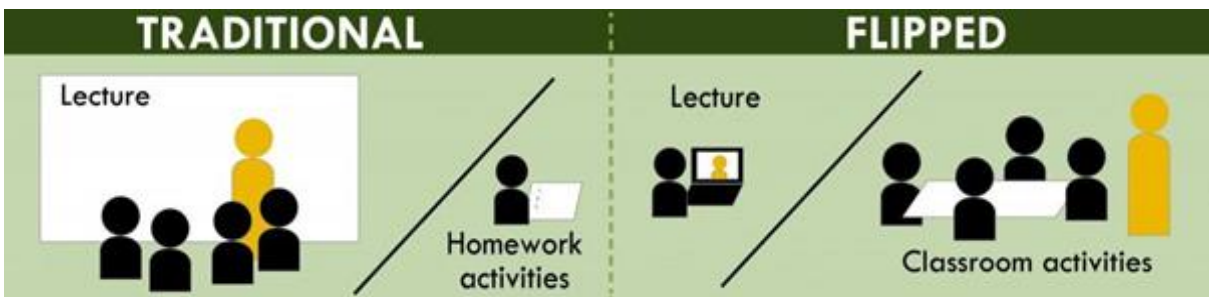
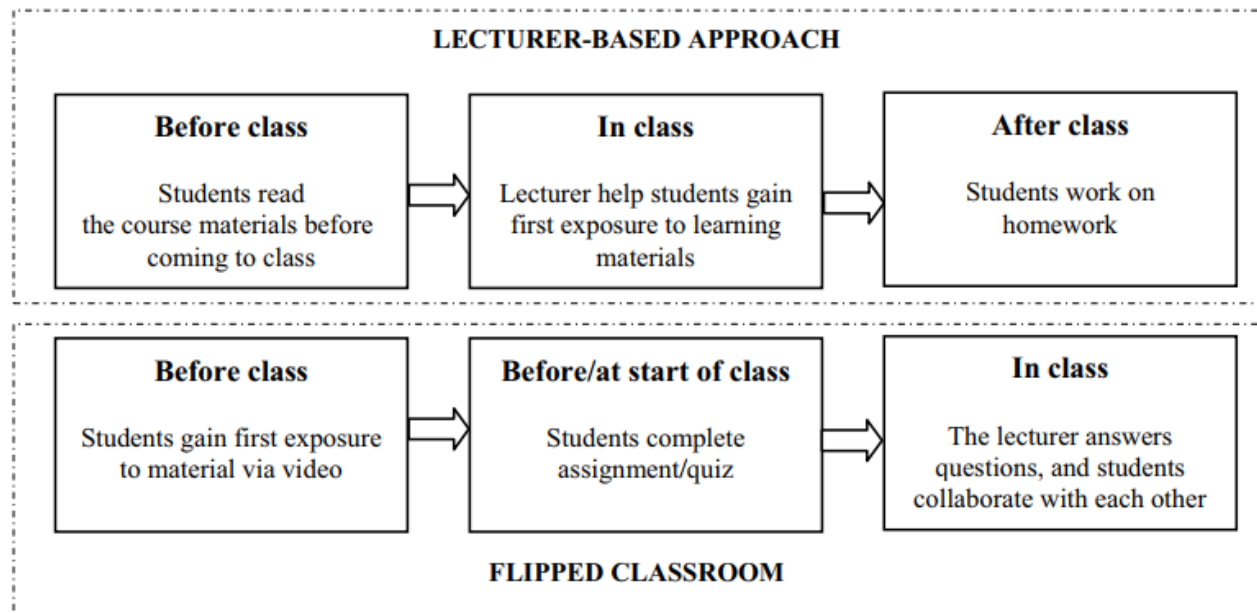
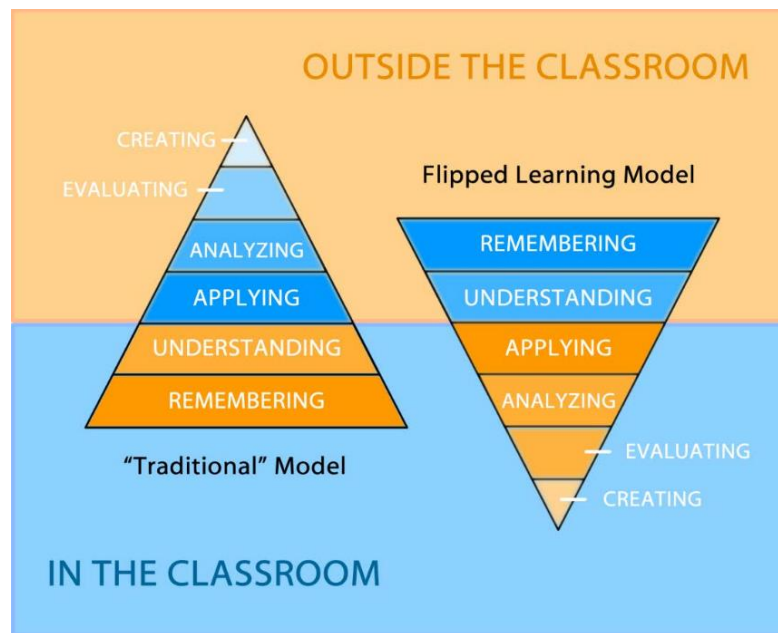


Figure 10.*Conventional Vs. Flipped Classrooms*

Note. Al-Samarraie et al. (2020) proposed this distinction based on three-phase teaching processes.

This approach provides students with the opportunity to share information, learning experiences, and knowledge to make sense of the material. The traditional goals for what happens inside and outside of the class are reversed, making student learning increasingly active, with students acquiring knowledge and comprehension before in-class meetings through pre-class activities. The revised Bloom's Taxonomy of the Cognitive Domain offers a helpful representation that aligns with the flipped learning approach (Figure 11).

Figure 11.*Flipped Vs. Conventional Learning in Bloom's Taxonomy*

Note. Adapted from Wagoner et al. (2013)

Despite advancements in technology and pedagogy, traditional teacher-centered teaching methods continue to be prevalent in the current information age. This is partly due to teachers not keeping up with the pace of change and advancements in technology (Almodaires et al., 2019; Washington et al., 2020). In this era, learning should not only be teacher-centered (Steen-Utheim & Foldnes, 2017; Swapp, 2017) but also a meaningful experience that stimulates critical thinking and problem-solving skills, self-regulation, and social connectedness (Du, 2020; Jdaitawi, 2019; Lee & Lai, 2017). These skills are important for students to succeed in their future careers (Rateau et al., 2015). Although the use of the flipped learning model is still limited (Jensen et al., 2015), it is emerging and growing as educators seek better methods of engagement. It is seen as a viable alternative to traditional teaching methods, bridging the gap between home and school (Alcaraz et al., 2020; Algayres & Triantafyllou, 2020; Hamon, 2014; Jacques & Lequeu, 2020).

In the flipped classroom model, students are introduced to content at home and then practice working through it in the classroom (Bergmann & Sams, 2012; Jacques & Lequeu, 2020; Tucker, 2012). This blended learning approach combines face-to-face interaction with independent study through technology. Students watch teacher-selected videos at home and then work on homework in the classroom, armed with questions and background knowledge (Aslan, 2020; Conner et al., 2014; TeachThought, 2016). In this model, teacher-centered learning is replaced by student-centered activities. The flipped approach provides opportunities for more engaged, active, and responsible learning (Kim et al., 2014). It also promotes critical thinking skills, reasoning, reflection, and problem-solving abilities (Keane, 2014; Väisänen & Hirsto, 2020). By encouraging students to solve problems and apply their knowledge in meaningful ways, the flipped model supports meaningful learning and higher-level thinking (Anderson & Krathwohl, 2001; Diningrat, 2020; TeacherVision, nd; Väisänen & Hirsto, 2020).

The flipped classroom method is a novel and impactful change from conventional teaching practices. It prioritizes student-centered learning and leverages technological advancements to foster knowledge construction, collaboration, and comprehension (Arnold-Garza, 2014; Diningrat, 2020). This approach gives students chances to exchange information and learning experiences, as well as co-create knowledge and grasp their learning journey (Bernauer, 2020; Hussin et al., 2015). Notably, the literature suggests that students' satisfaction is higher with flipped learning than with conventional learning.

1.5. Students' Perception of the Flipped Classroom

Employing the flipped classroom methodology in teaching fosters student autonomy in learning and enhances their proficiency in information and communication technology (ICT) through access to subject-related video lessons (Overmyer, 2012). Furthermore, according to

Arnold-Garza (2014), this approach augments students' problem-solving competencies and nurtures closer student-instructor relationships, accommodating diverse learning preferences. A study conducted by Afrilyasanti et al. (2016) aimed to investigate the impact of the flipped classroom on the writing skills of students studying English as a foreign language. The study sample consisted of 62 students from secondary schools in Indonesia, with the experimental group being taught writing skills through the flipped classroom approach, while the control group received conventional face-to-face instruction. The findings indicated superior performance among the experimental group compared to the control group.

The flipped classroom has also been found to positively impact students' academic achievement (Aşıksoy & Özdamlı, 2016). Female students perceived the flipped classroom as a more interesting learning experience and performed better than male students, particularly in terms of self-efficacy and motivation (Kenna, 2014; Aşıksoy & Özdamlı, 2016). However, Lee and Liu (2016) conducted a study that found no statistically significant differences in students' performance based on gender. Another study by Gross et al. (2015) found that students' scores increased by 12% through the use of the flipped learning approach, with the method being particularly beneficial for low-performing students and female students.

The impact of flipped learning extends beyond secondary school students to university students from various academic levels, but it requires experience with online learning and a willingness to embrace new learning styles (Adams et al., 2016). A study by Newman et al. (2016) found that students had a positive perception of flipped teaching and it had a significant impact on their knowledge acquisition. There were no significant differences in students' perceptions based on gender, specialization, or academic level.

In their study, Clark et al. (2016) examined the advantages and disadvantages of the flipped classroom model and its influence on the educational setting. Their research revealed that the method significantly affected students' academic performance, noting that compared to sophomores and juniors, freshmen expressed less satisfaction with the flipped classroom environment. The flipped classroom approach blends formal and informal learning styles and is designed to cater to students' preferences and learning styles, positively impacting their academic performance. Yang et al. (2018) found that students who learned English as a foreign language through the flipped classroom method scored higher than those in traditional classrooms and demonstrated improved performance in self-directed learning, interest in the subject matter, and the amount of in-class practice time.

The advantages of the flipped classroom approach include increased student engagement, collaboration with classmates and instructors, meaningful learning, active learning, and effective participation in the classroom (McCallum et al., 2015). However, Glynn Jr. (2013) noted that students who had a negative perception of flipped learning did not experience these benefits. Conversely, Phillips and Trainor (2014) discovered that students exhibited a preference for the flipped classroom approach compared to conventional lecture-based teaching methods, a sentiment corroborated by Blair et al. (2015). Moreover, educators observed that the flipped classroom model afforded increased opportunities to cultivate students' critical thinking abilities, thereby encouraging its sustained implementation.

1.6. The Implementation of the Flipped Classroom

The implementation and adoption of the flipped classroom model have become widespread in schools and universities globally. The concept was initially introduced in schools and later expanded to universities (Johnson et al., 2014). Bishop and Verleger's literature review (2013)

identified 24 studies concerning the flipped classroom, wherein student perceptions were predominantly favorable and coherent. In 2014, the Flipped Learning Network conducted another study that listed universities incorporating the flipped learning model across various fields of study, including the University of British Columbia, the University of Memphis, the University of North Carolina, Chapel Hill, Texas A&M University, the Capital University, the Georgia Institute of Technology, and Harvey Mudd College. Students in these institutions were observed to score better on exams and were generally satisfied with the new model (Yarbro et al., 2014). Furthermore, flipped classrooms were found to enhance students' information literacy and critical thinking skills, which are considered key components of 21st-century education (Kong, 2014).

Estes et al. (2014) introduced a tripartite framework for executing the flipped classroom approach, comprising first: pre-class tasks encompassing modeling and preliminary evaluation, second: in-class engagements involving concept clarification and problem resolution, and third: post-class assignments involving evaluation, application, and transfer. Students undertake the pre- and post-class tasks independently at home utilizing digital platforms and educational resources. This affords students the opportunity to engage with the instructional material autonomously and within their own environments, facilitating the revisitation of specific segments of digital content as required (Strayer, 2007). In the physical classroom, the in-class activities are conducted using active and participatory teaching techniques (Gariou-Papalexidou et al., 2017). The flipped classroom approach allows students to engage with the information they have learned outside of the classroom, combining it with their peers' experiences to become active users of information (Bergmann et al., 2011).

The importance of designing effective lesson plans has been acknowledged globally as a crucial responsibility of teachers, as it is a systematic process of deciding what and how students

should learn (Cicek & Tok, 2014). The main components of a successful lesson design include the learning objectives, the learning activities, and the evaluation of understanding (Skowron, 2001; Milkova, 2012). The formulation of clear learning objectives has been recognized as a significant challenge in lesson design (Gülten, 2013; Ruys et al., 2012; Gafoor & Farooque, 2010). Additionally, researchers have emphasized the importance of designing student activities over teacher activities (Froelich, 2009). Effective lesson design is necessary for various instructional styles, including integrated instruction, differentiated instruction, and problem-based learning (Skowron, 2001). However, designing lessons can be challenging, especially for differentiated instruction, and requires collaboration among teachers (Baker & Fleming, 2005; Fujii, 2016).

1.6.1. Course Content

The concept of the flipped classroom as a learning model gained widespread recognition through Salman Khan's TED talk (Khan, 2011), where he shared educational videos from the Khan Academy. In this model, students watch course videos at home and complete homework assignments in the classroom, following a fixed schedule (Chen et al., 2014). The Khan Academy soon became a significant resource for instructors using the flipped classroom, as they could use the videos provided instead of having to create their own educational videos from scratch (Johnson et al., 2014).

Other resources for the flipped classroom include Learners TV, Code Academy (Johnson et al., 2014), TED Talks, and TED-Ed (Furse and Ziegenfuss, 2015; Roach, 2014). Other popular sources of educational materials include Vimeo, YouTube, Teacher YouTube, PBS media iTunesU, Open Education Resources (OER), and Annenberg Learner (Furse & Ziegenfuss, 2015).

The course materials chosen for each lesson including videos and books should be evaluated one by one based on the following principles:

- Designing a video-based course that aligns with students' interests.
- Selecting content that includes supplementary materials such as subtitles and presentation files to aid further references and studies.
- Choosing engaging and inspiring videos to maximize student involvement.
- Selecting concise books to replace lengthy textbooks.

To identify relevant content, an exploration of the following websites is recommended:

Coursera

Coursera.org is a major player in the field of massive open online courses (MOOCs) and holds the largest market share in the MOOC industry. Coursera videos are produced using a picture-in-picture approach, which combines an instructor's recorded image and voice with PowerPoint slides, subtitles, and other animations (Chen & Wu, 2015).

Big Data University

BigDataUniversity.com is an online education platform that specializes in databases, big data, and Hadoop training. It utilizes content related to text mining and cloud computing, which is produced using a combination of picture-in-picture, voice-over, and interview videos (Chen & Wu, 2015).

Udemy

Udemy.com is an online education website with over 30,000 courses and 7 million viewers. The courses are created by individuals or institutions and the teachers could use the course "Scraping and Data Mining for Beginners and Pros," which uses voice-over presentation (Chen & Wu, 2015).

TED

TED (technology, entertainment, and design) is a conference where individuals present their ideas on a wide range of topics, including science and business, within a limited time frame. The conference videos can be found on TED.com. (TED-Talk Tuesday, 2014).

YouTube and Vimeo Websites

By conducting a search on YouTube.com and Vimeo.com using keywords related to the course being taught, an educator possesses access to a vast array of diverse videos and documentaries suitable for integration into course material.

1.6.2. Course Activities

The most crucial aspect of the flipped classroom approach is the in-class activities rather than the videos. Activities and peer-learning opportunities allow instructors to closely work with students and assess their course material comprehension (Coley et al., 2013). According to Bloom's revised taxonomy, students participate in fundamental cognitive operations like Remembering, Understanding, and Applying when autonomously reviewing course material. They also undertake advanced cognitive functions such as Analyzing, Evaluating, and Creating in collaborative classroom settings with guidance from instructors and peers (Brame, 2013; Krathwohl, 2002).

Table 3.

Course Activities

Activity type	Activities
Pre-session	Watching the videos and reading the assignments Analyzing TED-talks Writing about their understanding of the contents
During session	Discussion on videos and reading assignments
Post-session	Research on the topic using keywords and finding new contents

Note. These pre-, during and post-session activities are suggested by Sohrabi and Iraj (2016)

The course curriculum was segmented into three components: pre-session, during-session, and post-session, delineated in Table 3. These components were formulated to correspond with the updated edition of Bloom's Taxonomy (Krathwohl, 2002).

1.7. The Flipped Classroom Instructional Model in the Algerian EFL Setting

The COVID-19 pandemic led to the adoption of the flipped classroom model in Algerian higher education to reduce virus transmission. In the study done by Benkorichi and Benyahia (2022), this approach was explored for its effectiveness and application among 42 EFL teachers and 80 Master One EFL students at Barika University Center, revealing that while participants acknowledged its benefits, they faced organizational challenges, leading to a preference for a hybrid teaching approach post-pandemic. Further research at El-Amad private school in Relizane examined the model's impact on EFL learners' engagement and performance in English oral courses. Through a combination of questionnaires for 25 students and observations of four sessions, the study found that the flipped classroom significantly enhanced oral skill performance, suggesting its broader application for teaching other foreign languages (Zeggai, 2022). Additionally, a study at the University of Algiers 2 focused on the flipped classroom's effect on first-year EFL students' reading abilities. Using a quasi-experimental design with 100 participants, results indicated a significant improvement in reading skills and positive student perceptions of the method, underscoring its potential benefits in EFL education (Sebbah, 2022).

1.8. Benefits of the Flipped Classroom

The flipped classroom model offers numerous advantages, with one of its primary benefits being the augmentation of classroom interaction. This is achieved by reallocating the teacher's time from lecture delivery to fostering increased engagement in student-teacher interactions (Fulton, 2012). This allows the teacher to better address the learning and emotional needs of the students

(Goodwin & Miller, 2013). Within the flipped classroom framework, students are afforded the chance to participate in dialogues with their instructor, a circumstance less commonly encountered in conventional classroom environments (Bergmann & Wadell, 2012). According to Milman (2012), the flipped model also supports teamwork within the classroom.

This framework grants students the capacity to retrieve lecture videos at their convenience, enabling them to proceed with learning at a self-determined speed (Fulton, 2012). It also encourages students to think both inside and outside the classroom (Kellinger, 2012) and can be used with a variety of teaching strategies (Love et.al, 2013). The flipped classroom also allows parents to follow their children's courses and provide assistance (Goodwin & Miller, 2013). Additionally, Herreid and Schiller (2013) noted that the flipped classroom model gives students more time to conduct original research.

1.9. Challenges Faced during the Flipped Classroom

While the flipped classroom model offers numerous advantages, scholarly literature has addressed certain limitations. Initial resistance from some students towards the new approach may lead to incomplete preparation and engagement during class sessions. The quality of the lecture videos is also important, as they need to be carefully prepared to effectively prepare students for the course. This can be a time-consuming task, as noted by Herreid and Schiller (2013). Furthermore, the existing instructional frameworks available for the flipped classroom methodology are constrained. Kordyban and Kinash (2013) emphasized the challenge of ensuring students fulfill their out-of-class responsibilities, while Bristol (2014) underscored the complications arising when students attend sessions unprepared.

According to Kordyban and Kinash (2013), Another impediment to implementing the flipped classroom approach pertains to the lack of access to essential equipment such as

smartphones, tablets, or computers, alongside internet connectivity issues. Moreover, teachers encounter significant hurdles beyond merely creating and delivering lecture videos; integrating and preparing in-class activities within the flipped classroom format pose substantial challenges. This can lead to an increased workload for instructors, contrary to initial expectations (Lafee, 2013).

Conclusion

This chapter provides an analysis of the flipped classroom concept, emphasizing its significance in contemporary teaching and learning paradigms. It delves deeply into pedagogical approaches and student autonomy, highlighting the nuanced implementation of various instructional methods. Moreover, it elucidates the historical progression and development of the flipped classroom, emphasizing pivotal contributions from esteemed institutions such as the Khan Academy and the Massachusetts Institute of Technology. Their dissemination of complimentary educational materials spurred the proliferation of online learning platforms like Coursera and Udacity.

To facilitate a thorough understanding of the flipped classroom, the chapter begins by contextualizing it within the broader framework of blended learning, encompassing diverse models. Additionally, it delineates the foundational principles of the flipped classroom model, accentuating its central tenet where students interact with educational content beyond traditional class hours and then engage in participatory learning activities during in-class sessions. This elucidation is further enriched by a comparative examination, underscoring disparities between the flipped classroom approach and conventional lecture-oriented pedagogy.

Furthermore, the chapter examines the pragmatic execution of the flipped classroom, offering insights into crafting course content and activities aimed at maximizing student involvement and enhancing learning achievements. Besides, the use of the flipped classroom in the

Algerian EFL setting demonstrates how it was adopted due to COVID-19. It has been shown to enhance students' performance and engagement, although organizational challenges remain, with studies suggesting a preference for hybrid methods and highlighting its potential benefits for reading and oral skills. In closing, the chapter critically evaluates the merits and challenges associated with this innovative instructional approach, underscoring its potential to enhance student-centered learning environments while acknowledging logistical and pedagogical considerations.

CHAPTER 2:

INTROVERSION AND EXTROVERSION PERSONALITY TYPES

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Introduction

The study of introversion and extroversion, two fundamental dimensions of personality, has gained increasing significance in the field of language education, particularly in the context of EFL learning. These personality traits, originally introduced by Carl Jung in the early 20th century, have evolved and found their place in understanding how learners engage with language acquisition and classroom dynamics. This chapter delves into various aspects related to introversion and extroversion in EFL learning, aiming to provide educators, researchers, and practitioners with valuable insights into accommodating diverse personality types in language classrooms.

The chapter begins with an exploration of the theoretical foundations of introversion and extroversion, tracing their roots from Carl Jung's pioneering work to contemporary perspectives that shed light on these personality traits. Understanding the theoretical underpinnings forms the basis for comprehending their relevance in language learning. Moving on, we examine historical perspectives on the development of extroversion and introversion, which helps us contextualize the evolution of these personality concepts in psychology and their subsequent application in language education.

Introversion and extroversion in EFL learning is the central theme of this chapter, focusing on how these personality tendencies manifest in EFL learning environments. This section delves into how these traits influence students' engagement, participation, and language learning processes. The chapter then addresses the methods and instruments to assess introversion and extroversion in EFL learners, providing insights into various tools and assessments used for identifying these traits among language learners. These methods include self-report questionnaires, observation, classroom behavior assessment, language learning motivation scales, neurobiological measures, and cross-cultural adaptations.

To gain a deeper understanding of the practical implications, the chapter explores how introverted and extroverted EFL learners engage with language acquisition. It delves into their preferences, challenges, and strategies regarding language learning. Furthermore, we analyze the impact of personality types on language proficiency, engagement, and learning strategies, shedding light on how introversion and extroversion influence language proficiency, student engagement, and the choice of learning strategies.

In the section titled "Interaction of introverted and extroverted EFL learners in classroom settings", we explore the dynamics of these learners within the classroom. This includes their participation, engagement in group activities, interactions with teachers and peers, and communication styles. The chapter then offers insights into teaching methods to accommodate diverse personality types, providing a range of teaching approaches and strategies that can be employed to cater to the unique needs of both introverted and extroverted learners. A significant part of this chapter is dedicated to using the flipped classroom model with introverts and extroverts. It discusses how this model can create a balanced and inclusive learning environment for both personality types. This includes pre-class independent study, in-class collaborative activities, and balancing learning needs. Finally, the chapter concludes by synthesizing the key findings and insights presented throughout, emphasizing the importance of recognizing and accommodating diverse personality types in EFL classrooms to enhance language learning outcomes.

2.1. The Theoretical Foundations of Introversion and Extroversion

The origins of introversion and extroversion can be traced back to early psychological concepts, although the terms were not commonly used at the time. Sigmund Freud, a seminal figure in psychology, examined the concepts of introversion and extroversion within the context of his

psychoanalytic theory. Within Freud's theoretical framework, introversion-like inclinations were associated with the introverted libido, which encompassed inwardly-directed psychic energy and self-centered processes (Freud, 1915). Conversely, extroversion-like characteristics were tied to the extraverted libido, which involved outward-directed energy and a focus on external objects and people (Freud, 1915).

The contemporary comprehension of introversion and extroversion is greatly indebted to the contributions of the Swiss psychiatrist Carl Jung. In his seminal 1921 work "Psychological Types," Jung introduced and defined these terms within the context of personality (Jung, 1921). These concepts have since become central to the field of personality psychology and have been refined and expanded upon by subsequent researchers.

Carl Jung's theory of introversion and extroversion posits that individuals have different preferences for where they direct their energy and attention. Introverts are characterized by a tendency to focus inwardly, directing their energy toward their inner thoughts, feelings, and reflections. In contrast, extroverts tend to focus outwardly, directing their energy toward the external world of people, events, and activities (Jung, 1921). Within Carl Jung's theory of introversion and extroversion, he not only introduced these foundational personality dimensions but also constructed a comprehensive framework of psychological types. Jung's theory posits that personality is not binary but exists along a continuum, where individuals manifest diverse levels of introversion and extroversion. He introduced the notion of "function-attitudes" (thinking, feeling, sensation, and intuition) to further elaborate on how individuals process information and make decisions within the context of their introverted or extroverted orientation. For instance, an introverted thinker might engage in deep introspection and analysis, while an extroverted feeler may focus on interpersonal harmony and relationships. Jung's work laid the groundwork for the

understanding of personality as a complex interplay of various cognitive functions and orientations (Jung, 1921).

Building upon Jung's work, Hans Eysenck, a British psychologist, proposed a biological basis for introversion and extroversion. He suggested that these traits are influenced by differences in cortical arousal levels. According to Eysenck's theory (1967), introverts have higher baseline levels of cortical arousal and, therefore, seek out quieter and less stimulating environments to maintain an optimal level of arousal. Conversely, extroverts have lower baseline arousal levels and seek out more stimulating and social environments to achieve the same optimal level. Hans Eysenck's theory of biological underpinnings for introversion and extroversion was influential in shaping the field of personality psychology. Eysenck expanded on the concept of cortical arousal by proposing that introverts have a higher baseline level of arousal in the reticular activating system, which makes them more reactive to sensory stimulation and, therefore, more likely to seek solitude and quiet environments (Eysenck, 1967). Extroverts, conversely, have lower baseline arousal and seek out external stimulation to elevate their arousal levels. Eysenck's theory was instrumental in connecting personality traits to physiological processes, fostering research into the neurobiology of personality.

Moreover, the Big Five Personality Model, also known as the Five-Factor Model, is a widely accepted framework in modern personality psychology. It includes five broad personality dimensions, one of which is extraversion. In addition to extraversion, it comprises openness to experience, conscientiousness, agreeableness, and neuroticism (Costa & McCrae, 1992). Extraversion in the Big Five model encompasses traits such as sociability, assertiveness, and positive emotionality (Costa & McCrae, 1992). This model provides a more nuanced and empirical understanding of extraversion as part of a broader personality structure. Researchers have used this

model to study personality traits in various cultures and populations, providing evidence for the universality of extraversion and its relevance in understanding human behavior and interpersonal relationships (Costa & McCrae, 1992).

Another theory that deals with extroversion and introversion is Jeffrey Gray's Reinforcement Sensitivity Theory (1982), which delves into the neurobiological basis of introversion and extroversion. This theory posits that these personality traits are linked to individual differences in the brain's two primary motivational systems: The behavioral inhibition system (BIS) and the behavioral activation system (BAS) (Gray, 1982). It suggests that introversion and extroversion are related to individual differences in the brain's sensitivity to rewards and punishments. Introverts are thought to have a more sensitive and reactive BIS, making them cautious, risk-averse, and prone to anxiety in the face of potential threats or negative outcomes. In contrast, extroverts are believed to have a more responsive BAS, which drives them to seek rewards, pursue novelty, and engage in approach behaviors. Jeffrey Gray's Reinforcement Sensitivity Theory has contributed significantly to understanding how the brain's motivational systems influence personality and behavior.

Additionally, it is essential to note that introversion and extroversion are not solely determined by biology or genetics. Social and environmental factors also play a role in shaping these traits. For example, cultural norms, family upbringing, and life experiences can influence an individual's personality development and whether they exhibit introverted or extroverted tendencies (McCrae & Costa, 2003). For instance, cultures prioritizing group harmony and conformity may promote extroverted behaviors, while those emphasizing individualism may foster introverted tendencies. Positive or negative interactions with caregivers, peer relationships, and educational experiences can reinforce or modify an individual's introverted or extroverted traits.

These external factors interact with an individual's intrinsic temperament and genetic predispositions, resulting in the diverse range of personalities observed in the real world (McCrae & Costa, 2003).

In short, the theoretical foundations of introversion and extroversion draw upon a range of perspectives, from Carl Jung's original conceptualization to contemporary theories that incorporate biological, psychological, and environmental factors. These theories collectively provide a framework for understanding and studying the individual differences in how people engage with the world around them.

2.2. Introversion and Extroversion in EFL Learning

Introversion and extroversion are personality dimensions that play a significant role in the context of EFL learning. These traits, originally introduced by Carl Jung and further developed by subsequent psychologists, influence how individuals engage with language learning, interact with peers, and respond to various teaching methods. In this discussion, we will delve into the theoretical foundations of introversion and extroversion in the context of EFL learning, drawing on relevant research and theories.

Carl Jung's pioneering work in the early 20th century laid the theoretical groundwork for understanding introversion and extroversion. In the context of EFL learning, introverted students are often characterized by a preference for solitary study and reflection. They tend to thrive in quieter, focused learning environments where they can engage in introspective language practice, such as reading and writing (Jung, 1921). Extroverted learners, on the other hand, are more inclined to seek out social interactions and group activities. They may benefit from language learning experiences that involve active communication, group discussions, and collaborative learning (Jung, 1921).

On the one hand, introverted language learners often excel in tasks that require careful analysis of language structures and deep comprehension of texts. They may be more comfortable with grammar exercises, vocabulary memorization, and written assignments. Introverts tend to be self-motivated and may prefer self-paced language learning methods such as online courses or independent study. However, it is essential to consider the potential challenges introverted learners may face in EFL contexts. They may feel uncomfortable participating in large classroom discussions or speaking in front of their peers, which can hinder their oral language development. To support introverted EFL learners, educators can provide opportunities for structured and low-pressure speaking activities, peer partnerships, and individualized feedback (Arnold, 2011).

On the other hand, extroverted language learners thrive in social and interactive language learning environments. They are often enthusiastic about engaging in spoken communication, collaborating with classmates, and participating in group activities. In EFL classrooms, extroverted students may excel in oral presentations, debates, and language games (Arnold, 2011). However, extroverts may struggle with tasks that require extensive reading or writing in isolation. They may find traditional grammar drills less engaging and may benefit from dynamic and interactive language learning approaches (Arnold, 2011). Educators can harness extroverted learners' energy and enthusiasm by incorporating communicative language teaching methods, group projects, and peer teaching opportunities.

Effective language teaching acknowledges the diverse needs of both introverted and extroverted EFL learners. Creating a balanced learning environment considering different learning styles can enhance the language acquisition experience. This approach aligns with contemporary language teaching theories, such as the communicative language teaching (CLT) approach, which emphasizes meaningful communication and learner-centered activities (Richards & Rodgers,

2001). Moreover, recent research in EFL pedagogy recognizes that individuals exist along a continuum of introversion and extroversion rather than fitting into rigid categories (Dornyei & Ushioda, 2009). Thus, language instructors should aim to create flexible learning opportunities that accommodate their students' diverse preferences and personalities.

Accordingly, the theoretical foundations of introversion and extroversion, as introduced by Carl Jung and further developed by subsequent psychologists, offer valuable insights into the ways EFL learners engage with language acquisition. Recognizing and accommodating these personality traits can lead to more effective and inclusive language teaching strategies in EFL contexts. Balancing structured and interactive learning activities can provide a well-rounded language learning experience that caters to the diverse needs of introverted and extroverted students.

2.3. Assessing Introversion and Extroversion in EFL Learners

Assessing introversion and extroversion in EFL learners is a complex task that requires a nuanced approach. Various methods and instruments have been developed to measure these personality traits, offering insights into how they impact language learning.

2.3.1. Self-Report Questionnaires

Self-report questionnaires are commonly used to assess introversion and extroversion in EFL learners. These questionnaires ask learners to rate themselves on a series of statements or questions related to their social behavior, preferences, and tendencies. The following are some self-report questionnaires commonly used to assess introversion and extroversion.

2.3.1.1. The Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator (MBTI) is a widely recognized self-report tool utilized for evaluating personality attributes, encompassing traits such as introversion and extroversion.

Rooted in Carl Jung's theory of psychological types, the MBTI categorizes individuals into one of 16 distinct personality types, each delineated by a composite of four contrasting preferences:

- Extraversion (E) vs. Introversion (I): This dimension corresponds directly to the introversion-extroversion continuum. Individuals who score as "E" are considered extroverted, while those who score as "I" are considered introverted.
- Sensing (S) vs. Intuition (N): This aspect pertains to individuals' preferences in acquiring information. Although distinct from introversion and extroversion, it can shape individuals' information processing methods and their interactions with the environment.
- Thinking (T) vs. Feeling (F): This dimension pertains to how individuals make decisions and judgments. It is also not directly linked to introversion and extroversion but can affect interpersonal interactions.
- Judging (J) vs. Perceiving (P): This dimension relates to how individuals approach and organize their external world. It is not equivalent to introversion and extroversion but can also influence behavior and preferences (Myers et al., 1998).

In the context of EFL learners, the MBTI can offer insights into how students may approach language learning tasks, communication preferences, and collaborative learning. However, its use should be accompanied by recognizing its limitations and considering other assessment methods and theories related to introversion and extroversion.

2.3.1.2. Eysenck Personality Questionnaire (EPQ)

The EPQ, developed by Hans Eysenck, is a widely recognized self-report questionnaire for assessing introversion and extroversion (Eysenck & Eysenck, 1975). Researchers have adapted the EPQ to EFL contexts to understand how introversion and extroversion relate to language learning motivation, classroom participation, and language anxiety (Dornyei, 2005; Horwitz et al., 1986).

2.3.1.3. Big Five Personality Inventory

The Big Five Personality Inventory evaluates five overarching personality dimensions, among which is extraversion. Commonly, it incorporates inquiries regarding sociability, assertiveness, and positive emotional disposition (Costa & McCrae, 1992). Scholars have integrated assessments of extraversion from the Big Five Personality Inventory to investigate its impact on language learning behaviors and inclinations (Dornyei & Ushioda, 2009).

2.3.1.4. Introversion-Extroversion Inventory

Some researchers have developed their own introversion-extroversion inventories tailored to language learning contexts. These inventories contain statements related to language learning behaviors, such as willingness to participate in class discussions or group activities (Ehrman & Oxford, 1995). They provide a context-specific assessment of introversion and extroversion in language learners and can be used to explore how personality traits impact language learning strategies and classroom interactions.

2.3.1.5. Language Learning Motivation Scales

While not exclusively focused on introversion and extroversion, motivation scales in language learning often include items related to social motivation and individual goal orientation. These scales can indirectly reflect the learner's personality traits (Dornyei, 2005; Gardner, 1985). Researchers use motivation scales to understand the motivations behind language learning choices, including whether introverted learners are more intrinsically motivated or whether extroverted learners are more socially motivated.

2.3.1.6. Adapted Cultural Personality Inventories

In cross-cultural EFL research, personality inventories are sometimes adapted or modified to be culturally appropriate and sensitive. These adaptations may include items related to cultural

behaviors and attitudes (McCrae et al., 2005). The adapted inventories allow for a more culturally nuanced assessment of introversion and extroversion among EFL learners from diverse linguistic and cultural backgrounds.

It is important to note that self-report questionnaires have limitations, including potential biases and social desirability effects. Therefore, researchers often use a combination of methods, including classroom observations, peer and teacher assessments, and motivational interviews, to triangulate their findings and gain a more comprehensive understanding of how introversion and extroversion manifest in EFL learners.

2.3.2. Observation and Classroom Behavior Assessment

In the context of EFL pedagogy and research, observing the classroom behavior of language learners is a valuable method for assessing introversion and extroversion (Richards & Rodgers, 2001). This approach involves carefully monitoring and documenting how learners interact with their peers, engage with language learning tasks, and participate in classroom activities.

Participation in class discussions is one of the primary behaviors that can indicate introversion or extroversion is a student's willingness to participate in class discussions (Horwitz, Horwitz, & Cope, 1986). Extroverted learners may be more likely to actively engage in verbal exchanges, offer their opinions, and initiate conversations. They may readily volunteer to answer questions, share their thoughts, and express themselves vocally.

Furthermore, the way students respond to group activities and collaborative learning tasks can provide insights into their personality traits (Ehrman & Oxford, 1995). Extroverted learners may thrive in group settings, enjoying teamwork and social interaction. They might take on leadership roles, facilitate discussions, and readily contribute to group projects.

Additionally, observing in-class communication and how students interact with their peers during breaks, before or after class, and in informal settings can also reveal aspects of their introversion or extroversion (MacIntyre, 2007). Extroverted individuals might be more outgoing, initiating conversations with classmates and maintaining an active social presence within the language learning community.

Besides, introverted learners might exhibit varying levels of discomfort when it comes to public speaking or delivering presentations (Horwitz, Horwitz, & Cope, 1986). They may be more reserved and hesitant when speaking in front of the class, preferring written assignments or smaller group discussions as a means of expression.

In the same vein, the choice of working independently or in solitude versus collaborating with others can be indicative of introversion or extroversion (Dornyei, 2005). Introverted learners might favor tasks that allow for focused, solitary work, such as reading comprehension exercises or individual writing assignments.

Sometimes, introverted and extroverted learners may demonstrate distinct preferences for classroom seating (Richards & Rodgers, 2001). Introverts might choose seats closer to the back or sides, where they can have more personal space and less social interaction. Extroverts might gravitate toward the front or center, seeking opportunities for active participation.

Observing non-verbal cues, such as body language, facial expressions, and gestures, can complement the assessment of introversion and extroversion (Horwitz, Horwitz, & Cope, 1986). Introverted individuals may display subtler non-verbal cues and might appear more reserved in their expressions.

It is essential to approach classroom behavior assessment with sensitivity and an awareness of cultural differences (Dornyei & Ushioda, 2009). Introverted learners may come from diverse

cultural backgrounds where social interactions in the classroom may vary. Moreover, individuals exist along a continuum of introversion and extroversion, making it crucial to avoid rigid categorizations.

Additionally, combining classroom behavior observations with other assessment methods, such as self-report questionnaires or peer assessments, can offer a more comprehensive understanding of how introversion and extroversion manifest in language learning contexts (MacIntyre, 2007). This multifaceted approach allows educators and researchers to tailor instructional strategies to meet the diverse needs of EFL learners.

2.3.3. Language Learning Motivation

Language learning motivation plays a pivotal role in understanding how introversion and extroversion manifest among EFL learners. Motivation refers to the internal and external factors that drive individuals to engage in language learning activities and persist in their efforts (Dörnyei, 2005). In the context of assessing introversion and extroversion, the following aspects are essential to consider.

2.3.3.1. Motivation Types

Motivation can be broadly categorized into two main types: Intrinsic and extrinsic (Deci & Ryan, 1985). Intrinsic motivation is driven by personal interests, enjoyment, and the inherent satisfaction of language learning itself. Introverted learners may exhibit higher levels of intrinsic motivation, as they often seek personal endeavors and enjoyment in individual activities. Extroverted learners can display intrinsic motivation but they may prefer group work and collaborations, (Horwitz et al., 1986).

On the other hand, extrinsic motivation stems from external rewards or pressures and may vary among introverted and extroverted learners. Extroverts may respond positively to social

recognition and external praise while seeking social interaction and enjoyment in collaborative activities, while introverts may be less influenced by external factors and driven more by personal goals (Dörnyei, 2005) However, introverted learners may also display extrinsic motivation but may prefer individual tasks or quieter learning environments where they can focus on their internal interests and reflections (Horwitz et al., 1986).

2.3.3.2. Social Motivation

Social motivation, a subset of motivation, pertains to learners' desires to connect with others through language (Gardner, 1985). Extroverted learners often exhibit socially solid motivation, as they enjoy interacting with peers, making new friends, and using the language for communication. They may actively seek out opportunities for social interaction in the target language.

While still capable of social motivation, introverted learners may approach it differently. They may prefer one-on-one interactions or smaller group settings where they can engage in deeper, meaningful conversations, reflecting their preference for more intimate social exchanges (McCrae & Costa, 1992).

2.3.3.3. Goal Orientation

Goal orientation in language learning refers to learners' objectives and aspirations (Dörnyei, 2005). Extroverted learners may set goals related to social integration, such as joining language clubs, participating in language exchange programs, or using the language in real-life social contexts. Introverted learners may set goals focused on personal growth and competence, such as achieving a high level of language proficiency, mastering grammar and vocabulary, or writing reflective journals in the target language (Horwitz et al., 1986).

2.3.3.4. Classroom Participation

Observing classroom participation patterns can provide insights into learners' motivation and introversion-extroversion tendencies. Extroverted learners may be more vocal during class discussions, eager to share their ideas, and willing to take on leadership roles in group activities.

Introverted learners may prefer written assignments, individual tasks, or quieter forms of participation. They may contribute to class discussions but may need more time to formulate their thoughts and may choose their moments carefully (Ehrman & Oxford, 1995).

Motivation in language learning is a multifaceted construct that interacts with introversion and extroversion. While extroverted learners may often display more visible signs of motivation, introverted learners can also be highly motivated but may express it differently, often valuing personal growth and internal satisfaction. Understanding these motivational nuances can inform language teaching strategies catering to EFL learners' diverse needs and preferences.

2.3.4. Neurobiological Measures

Advancements in neuroscience have opened up new avenues for understanding the neurobiological underpinnings of introversion and extroversion (DeYoung, 2010). Neuroimaging studies have become valuable tools for investigating the neural processes associated with these personality dimensions.

Neuroimaging methods, such as functional magnetic resonance imaging (fMRI) and positron emission tomography (PET), have provided researchers with the ability to examine the brain's structural and functional differences related to introversion and extroversion (Canli et al., 2001). These techniques allow for observing brain activity while individuals engage in various cognitive and social tasks.

Besides, studies have revealed differences in brain structures and functions associated with introversion and extroversion. For instance, extroverts may show greater responsiveness in brain regions associated with reward processing and social engagement, such as the ventral striatum and anterior cingulate cortex (DeYoung, 2010). On the other hand, introverts may exhibit heightened activation in areas linked to introspection and self-awareness, including the default mode network (DMN) and the prefrontal cortex (Canli et al., 2001). These regions are involved in self-reflection, internal thought processes, and decision-making.

Neurobiological research suggests introverts and extroverts may differ in neural responsiveness to environmental stimuli. Extroverts might exhibit a heightened sensitivity in their behavioral activation system (BAS), which can render them more receptive to rewards and inclined towards seeking novel and gratifying experiences (DeYoung, 2010). Conversely, introverts may demonstrate a more pronounced behavioral inhibition system (BIS), making them more sensitive to potential threats and punishments. This heightened BIS sensitivity may lead introverts to be more cautious and risk-averse (Gray, 1982).

Neuroimaging studies have also explored how introverts and extroverts process emotional stimuli. When exposed to rewarding or socially stimulating stimuli, research has shown that extroverts may exhibit increased activity in brain regions associated with positive emotions, such as the amygdala and the ventral striatum (Canli et al., 2001). On the other hand, introverts may display different patterns of neural activation, emphasizing cognitive processing and introspection in response to emotional stimuli.

Understanding the neurobiological basis of introversion and extroversion can have implications for language learning strategies. For example, introverted learners may benefit from strategies that emphasize focused, individualized learning and self-paced exploration, aligning with

their neurobiological traits. Extroverted learners may thrive in more socially interactive and communicative language learning settings (MacIntyre, 2007).

Incorporating neurobiological measures into the assessment of introversion and extroversion can provide valuable insights into the neural mechanisms underlying these personality dimensions. However, it is essential to consider that neurobiological research is still evolving, and more studies are needed to fully understand the complex interplay between brain structure, function, and personality traits.

2.3.5. Cross-Cultural Adaptations

Assessing introversion and extroversion in a multicultural and multilingual context requires careful consideration of cross-cultural adaptations. Personality traits, including introversion and extroversion, can manifest differently across cultures (McCrae & Terracciano, 2005). There are some key aspects to consider.

First, different cultures have varying norms and expectations regarding expressiveness and communication styles (Matsumoto, 1990). Extroverted behaviors, such as assertiveness and sociability, may be encouraged and reinforced in some cultures, while introverted traits, such as introspection and restraint, may be valued in others (Yoo & Robinson, 2010).

When conducting cross-cultural adaptations, it is essential to investigate the influence of cultural contexts on the manifestation of introversion and extroversion and to ensure that assessment tools accommodate these variations (Azadipour, 2019).

Second, when assessing introversion and extroversion in EFL learners, it is essential to consider language proficiency and potential language barriers. Translation and adaptation of assessment tools into the learners' native languages may be necessary to ensure accurate responses (Hambleton, 2001). Also, items and response formats should be culturally sensitive and

linguistically appropriate to avoid misinterpretations and measurement biases (Van de Vijver & Poortinga, 2005).

Additionally, cultural norms and values can influence self-reporting tendencies. In some cultures, individuals may be more inclined to provide socially desirable responses or conform to cultural expectations, which can affect the assessment of introversion and extroversion (Church et al., 2013). To address this, cross-cultural adaptations should include validation studies that assess the equivalence of measurement instruments across different cultural groups (Azadipour, 2019).

On top of that, language instructors and educational psychologists should be culturally sensitive when providing feedback and interventions based on assessments of introversion and extroversion. Cultural competence involves understanding and respecting diverse cultural perspectives on personality and behavior (Sue et al., 1982). Besides, educators should consider individual learners' cultural backgrounds and preferences when tailoring language learning strategies (Dörnyei & Ushioda, 2009).

Introversion and extroversion may manifest differently within a single cultural group due to individual variations and contextual factors (McCrae & Costa, 1997). It is essential to avoid oversimplified stereotypes and consider the complexity of personality expression within and across cultures. Cross-cultural adaptations are crucial when assessing introversion and extroversion among EFL learners. These adaptations ensure that personality assessments are culturally valid and take into account the nuances of personality expression in diverse cultural settings. By embracing cultural diversity and sensitivity, educators and researchers can better understand how introversion and extroversion influence language learning experiences across cultures.

Assessing introversion and extroversion in EFL learners involves a multidimensional approach that combines self-report questionnaires, observations, motivational scales, and, in some

cases, neurobiological measures. These assessments provide a holistic understanding of how personality traits influence language learning preferences, motivation, and classroom behavior. It is crucial to adapt and validate assessment methods to suit EFL contexts' cultural and linguistic diversity, ensuring accurate and meaningful evaluations of introversion and extroversion.

2.4. Introverted and Extroverted EFL Learners and Language Acquisition

Understanding the differences in how introverted and extroverted EFL learners approach language acquisition is essential for effective language teaching and learning strategies (Dörnyei, 2005).

2.4.1. Introverted Learners

Introverted EFL learners often display distinct characteristics in their language learning process. Introverts tend to be more comfortable with solitary activities. They may prefer self-study, reading, and working independently on language exercises (Dörnyei, 2005). Introverted learners may also be more cautious when speaking the target language, especially in larger group settings. They might take their time formulating sentences and need a quieter, less intimidating environment to practice speaking (Horwitz et al., 1986).

Introverts are often reflective and analytical. They may excel in tasks that require careful analysis of grammar rules, vocabulary, and complex sentence structures (Ehrman & Oxford, 1995). Furthermore, they may express themselves more effectively through written communication and excel in written assignments, essays, and journaling (MacIntyre, 2007).

2.4.2. Extroverted Learners

Extroverted EFL learners exhibit their own set of characteristics in language acquisition. Extroverts thrive on social interaction; they are more likely to participate actively in class

discussions, engage in group activities, and seek opportunities for verbal communication (Dörnyei, 2005). Extroverted learners are also generally more willing to take risks when speaking the target language. They may embrace opportunities for public speaking, presentations, and conversations (Horwitz et al., 1986).

Moreover, extroverts benefit from interactive learning experiences. They enjoy conversing with native speakers, participating in language clubs, and using the language in real-life contexts (MacIntyre, 2007). They may express their emotions more vocally, which can enhance their ability to convey feelings and opinions in the target language (McCrae & Costa, 1992).

To support both introverted and extroverted EFL learners, educators should create inclusive learning environments that accommodate diverse learning styles (Dörnyei & Ushioda, 2009). This might include a blend of activities, such as group discussions for extroverts and independent projects for introverts. Encouraging peer collaboration, allowing for individualized learning pathways, and providing a variety of assessment methods can help address the preferences and needs of both personality types (MacIntyre, 2007).

Recognizing the preferences and tendencies of introverted and extroverted EFL learners is vital for tailoring teaching approaches. By providing a balanced and inclusive language learning environment, educators can facilitate the success of both personality types, ultimately enhancing language acquisition and proficiency.

2.5. The Impacts of Personality Types

Introversion and extroversion hold an influence on various facets of language education. We explore how these personality traits impact language proficiency, student engagement, and the choice of learning strategies.

2.5.1. Language Proficiency

Introverted EFL learners tend to excel in language proficiency due to their detail-oriented and focused nature. They often exhibit a firm grasp of grammar rules, a rich vocabulary, and an emphasis on accuracy in written assignments (Dörnyei, 2005). For instance, introverts are more likely to carefully analyze sentence structures and choose precise words, which can result in well-structured essays and reports (Horwitz et al., 1986).

In contrast, extroverted learners are often characterized by their ease in spoken language. They frequently demonstrate higher oral proficiency, rapid vocabulary acquisition, and adaptability in real-life communication situations (McCrae & Costa, 1992). Extroverts thrive in social interactions, which enables them to practice speaking more frequently and comfortably (MacIntyre, 2007).

Effective language learning often involves finding a balance between these personality traits. Educators can encourage introverted learners to step out of their comfort zones and practice more spoken language. Similarly, extroverted learners can benefit from structured study of grammar and written exercises to enhance their overall language proficiency (Horwitz et al., 1986).

2.5.2. Academic Engagement

Introverts are known for their ability to engage deeply in their studies. They often prefer focused, individualized learning, which can lead to a thorough understanding of language components such as grammar and syntax (Ehrman & Oxford, 1995). Their inclination toward introspection and critical thinking can result in in-depth analysis of reading materials, fostering improved comprehension (Dörnyei, 2005).

Meanwhile, extroverted learners are highly engaged when interacting with peers. They actively participate in class discussions, group activities, and language clubs, seeking opportunities

for social interaction to practice and improve their language skills (MacIntyre, 2007). Group discussions and conversational settings allow extroverts to develop fluency and spontaneity in their spoken language (Horwitz et al., 1986).

Effective language instruction includes opportunities for both introverted and extroverted learners to engage. A balanced curriculum may incorporate individualized projects to cater to the preferences of introverted learners and peer collaboration to meet the social needs of extroverted learners. Encouraging an inclusive and diverse classroom environment promotes the active participation of all students, regardless of their personality types (Dörnyei & Ushioda, 2009).

2.5.3. Learning Strategies

Introverted learners often employ self-regulation strategies. They tend to plan and organize their language learning, set specific goals, and monitor their progress meticulously (Dörnyei, 2005). Self-regulation can lead to effective time management and the ability to persistently work through challenging language tasks (Ehrman & Oxford, 1995).

Extroverts thrive in interactive learning environments. They may rely heavily on group discussions, language exchange, and real-life communication experiences as primary learning strategies (MacIntyre, 2007). Group activities allow extroverts to practice the language in social contexts, leading to enhanced conversational skills and a better understanding of cultural nuances (Horwitz et al., 1986).

Balancing learning strategies can foster language learning. Introverted learners can benefit from incorporating more interactive activities into their strategies, as this can help them become more comfortable with spoken language. Extroverted learners can improve their language proficiency by dedicating time to structured self-study and written exercises, which can reinforce grammar and vocabulary knowledge (Dörnyei, 2005).

The impact of personality types, specifically introversion and extroversion, on language proficiency, engagement, and learning strategies is multifaceted. Recognizing these traits in EFL learners and addressing them in language instruction is essential for optimizing learning outcomes. Educators have the opportunity to address the varied requirements and inclinations of introverted and extroverted learners by establishing a nurturing and encompassing learning milieu, thereby enhancing their language proficiency and enjoyment of the educational journey.

2.6. Classroom Interaction of Introverted and Extroverted EFL Learners

The classroom is a dynamic environment where diverse personalities converge, and the interplay between introverted and extroverted learners can significantly influence the learning environment. In the following section, we delve into the intricate dynamics of how introverted and extroverted EFL learners interact within classroom settings.

2.6.1. Classroom Participation

Introverted EFL learners commonly demonstrate a predilection for careful observation and reflection prior to partaking in classroom dialogues. Initially, they might refrain from volunteering or actively engaging in class interactions (Horwitz, Horwitz, & Cope, 1986). Conversely, extroverted learners typically embrace classroom involvement, readily participating in discussions, offering responses to inquiries, and initiating conversations with both instructors and peers (MacIntyre, 2007).

To encourage balanced interaction, educators can implement strategies to support both personality types. For instance, providing opportunities for written reflections before open discussions can help introverted learners feel more comfortable contributing (Horwitz, Horwitz, & Cope, 1986). Extroverted learners can also be encouraged to give others a chance to participate actively.

2.6.2. Group Activities

Introverts may initially be apprehensive about group activities but can thrive in smaller, more focused group settings. They often contribute their insights thoughtfully, excel in tasks requiring detailed analysis, and appreciate quieter collaborative environments (Ehrman & Oxford, 1995). In comparison, extroverts enjoy group dynamics and often take on leadership roles in group activities. They readily express their ideas, initiate discussions, and help facilitate team collaboration (MacIntyre, 2007). Instructors can foster effective group dynamics by forming diverse teams that include a mix of introverted and extroverted learners. This creates a supportive environment where introverts can share their insights, and extroverts can harness their social skills to encourage participation (Ehrman & Oxford, 1995).

2.6.3. Teacher-Student Interactions

Introverted EFL learners often prefer one-on-one interactions with teachers. They may feel more comfortable seeking clarification or feedback in private, where they can express themselves more openly (Horwitz, Horwitz, & Cope, 1986). Extroverted learners, on the other hand, are inclined to engage in more frequent and public interactions with teachers. They may ask questions, seek guidance, and actively participate in class discussions, demonstrating a desire for immediate feedback (MacIntyre, 2007). Besides, teachers can balance their interactions by making themselves accessible to both introverted and extroverted learners. Encouraging introverts to seek clarification privately and extroverts to contribute to class discussions can help meet the needs of all students (Horwitz, Horwitz, & Cope, 1986).

2.6.4. Peer Communication

Introverts may engage in peer communication but often prefer smaller, more intimate interactions with a few close friends. They may choose their conversation partners carefully and

engage in more profound, meaningful discussions (Ehrman & Oxford, 1995). However, extroverted learners are typically more outgoing in their peer interactions. They readily approach classmates, initiate conversations, and enjoy engaging in group discussions and social activities (MacIntyre, 2007).

Instructors can foster peer collaboration by creating opportunities for both introverted and extroverted learners to interact comfortably. Group projects, language clubs, and collaborative activities should accommodate various interaction preferences (Ehrman & Oxford, 1995). The interaction of introverted and extroverted EFL learners in classroom settings can be dynamic and beneficial when adequately managed. Recognizing and respecting these personality differences can help educators create an inclusive and supportive learning environment that caters to all students' diverse needs and preferences, ultimately enhancing the language learning experience.

2.7. Teaching Methods to Accommodate Diverse Personality Types

In the ever-evolving landscape of education, catering to diverse personalities and learning preferences is essential for effective teaching. Therefore, it is essential to delve into various teaching methods specifically designed to accommodate introversion and extroversion's unique traits and tendencies.

2.7.1. Flipped Classroom Approach

The flipped classroom approach, where students independently learn content before class and later use the in-class time for active engagement (Bergmann & Sams, 2012), can be particularly beneficial for introverted students. They appreciate the opportunity for self-paced, focused learning during independent study (McCrae & Costa, 1992). Extroverted students can also thrive in a flipped classroom environment. They actively participate in collaborative activities and discussions during class, satisfying their need for social interaction (MacIntyre, 2017). A balanced approach involving

individual study and group activities accommodates both personality types, fostering a supportive and inclusive learning environment (Dörnyei & Ushioda, 2009).

2.7.2. Project-Based Learning

Project-based learning allows students to work independently on long-term projects and aligns well with the introspective nature of introverted students. They can delve deep into research, analysis, and presentation, all of which align with their preference for thoughtful contemplation (Horwitz et al., 1986). In group projects, extroverted learners can collaborate, take on leadership roles, and present their findings confidently, catering to their social nature (Ehrman & Oxford, 1995). Moreover, offering a variety of project options allows students to choose based on their personality and learning style, promoting inclusivity and catering to diverse needs (Dörnyei & Ushioda, 2009).

2.7.3. Socratic Seminars and Critical Thinking

Socratic seminars involve in-depth discussions where students explore complex questions. Introverts may excel in this method as they have time to formulate thoughtful responses and engage in deep analysis (Horwitz et al., 1986). In addition, extroverts can thrive in Socratic seminars by actively participating in discussions and engaging in dialogue with their peers (MacIntyre, 2007). Teachers can also facilitate discussions to ensure that all students, regardless of their personality type, have the opportunity to contribute and learn from one another (Horwitz et al., 1986).

2.7.4. Multimodal Learning Resources

Granting access to diverse educational materials like online tutorials, textbooks, and recorded lectures facilitates introverted learners' engagement in self-directed learning, enabling them to proceed at their preferred pace (Dörnyei & Ushioda, 2009). Conversely, extroverted individuals can derive advantages from interactive resources such as language games, multimedia

presentations, and collaborative group activities, which encourage active involvement and social engagement (MacIntyre, 2007). Besides, teachers can offer a range of learning materials and resources, allowing students to choose those that align with their learning preferences, thus accommodating diverse needs (Dörnyei & Ushioda, 2009).

2.7.5. Peer Teaching and Tutoring

Introverted students may feel more comfortable teaching their peers in one-on-one or small group settings. This method allows them to share their expertise and knowledge in a less intimidating environment (Ehrman & Oxford, 1995). Extroverts can thrive as peer tutors by actively engaging with their peers and using their communication skills to explain concepts (MacIntyre, 2007). On top of that, encouraging peer teaching and tutoring fosters collaboration and allows students to learn from each other, regardless of their personality type (Dörnyei & Ushioda, 2009). Employing diverse teaching methods in the EFL classroom can cater to the varied learning preferences of introverted and extroverted students. By offering a balanced mix of instructional strategies, teachers can create an inclusive learning environment where all students can excel and feel comfortable in their language learning journey, promoting both academic success and personal growth (Dörnyei & Ushioda, 2009).

2.8. Using the Flipped Classroom Model with Introverts and Extroverts

The flipped classroom model is a versatile pedagogical approach that can be adapted to cater to the distinct learning preferences of both introverted and extroverted EFL learners, offering a more inclusive and practical educational experience (Bergmann & Sams, 2012).

2.8.1. Pre-Class Independent Study: Fostering Individual Learning and Autonomy

Pre-class independent study is a fundamental component of the flipped classroom model, and it plays a crucial role in accommodating the diverse learning preferences of introverted and

extroverted EFL learners (Bergmann & Sams, 2012). This phase encourages students to engage with course materials before face-to-face class sessions, allowing them to take charge of their learning experiences and prepare for collaborative activities effectively (Dörnyei & Ushioda, 2009).

Introverted students often thrive in environments where they can control their learning pace (McCrae & Costa, 1992). Pre-class independent study offers them the flexibility to absorb content at their own speed, ensuring a deeper understanding of the material. Introverts are inclined toward introspection and deep reflection (Eysenck, 1967). During independent study, they have the opportunity to contemplate the lesson content, formulate questions, and develop critical thinking skills. This introspective process contributes to a more profound grasp of the subject matter.

Moreover, the pre-class phase allows introverted learners to build confidence in their understanding of the material (Horwitz et al., 1986). When they enter the classroom, they are better prepared to ask questions, seek clarifications, and actively participate in discussions, as they have already engaged with the content.

Since extroverted learners are often more social and thrive on interaction (MacIntyre, 2007), pre-class independent study offers them opportunities to engage in group discussions, virtual forums, or online chats with peers who share their extroverted tendencies. This collaborative preparation satisfies their social interaction needs even before the in-class session. Extroverts may use the pre-class phase to actively seek out peers and engage in discussions about the upcoming lesson. This proactive approach allows them to harness their social energy, share ideas, and exchange perspectives with fellow students. In addition, they may naturally take on the role of peer tutors during the pre-class phase. They might initiate study groups or collaborative projects, helping

others in their understanding of the content and facilitating a peer-driven learning experience (MacIntyre, 2017).

To create an inclusive learning environment that caters to both introverted and extroverted learners, instructors can provide a variety of pre-class resources, such as videos, readings, quizzes, and interactive simulations, to accommodate diverse learning styles (Dörnyei, 2005). They can also encourage students to share their pre-class reflections or questions in online forums, allowing both introverted and extroverted learners to participate in virtual discussions (Dörnyei & Ushioda, 2009) and offer guidance on effective independent study techniques, time management, and goal-setting to empower students to take ownership of their learning.

2.8.2. In-Class Collaborative Activities: Fostering Interaction and Engagement

In-class collaborative activities are a cornerstone of the flipped classroom model and serve as a dynamic platform for accommodating diverse learning preferences, including those of introverted and extroverted EFL learners (Bergmann & Sams, 2012).

Introverted students often appreciate structured and purposeful interactions (McCrae & Costa, 1992). In-class collaborative activities provide them with a controlled environment where they can engage in group discussions, peer teaching, or problem-solving tasks with clear objectives and guidelines (Horwitz et al., 1986). They tend to contribute thoughtfully when they feel that their input is valued (Eysenck, 1967). Collaborative activities allow them to participate meaningfully by offering insights and analysis, enhancing their language skills in a supportive setting. Introverted learners excel in active listening, which is a critical language skill (Horwitz et al., 1986). Collaborative activities encourage them to listen attentively to their peers, comprehend different viewpoints, and respond effectively, honing their language comprehension abilities.

For extroverted students, they thrive in social environments and often seek opportunities for interaction (MacIntyre, 2007). Collaborative activities provide them with outlets to engage in lively discussions, debates, and teamwork, fostering a sense of social connection and satisfaction. They tend to be more comfortable expressing themselves verbally (McCrae & Costa, 1992). In-class activities allow them to practice language skills through dialogue, presentations, and group projects, facilitating language development through real-time communication (MacIntyre, 2017). Extroverted learners may naturally take on leadership roles in collaborative activities, such as group facilitators or discussion leaders. This allows them to guide discussions, manage group dynamics, and develop leadership skills (Ehrman & Oxford, 1995).

To create a balanced and inclusive learning environment that accommodates both introverted and extroverted learners, instructors can structure collaborative activities with clear objectives and roles to provide a sense of security for introverted students (Dörnyei & Ushioda, 2009), encourage introverts to participate actively by valuing their insights and ensuring that their contributions are acknowledged and respected (Horwitz et al., 1986). They can also offer extroverted students opportunities for open dialogue and expression while fostering an environment of active listening and respect for diverse viewpoints (MacIntyre, 2007).

Through the integration of cooperative tasks within the flipped classroom paradigm, educators have the opportunity to establish a vibrant and inclusive learning atmosphere that leverages the unique strengths and inclinations of each learner. This approach contributes to the augmentation of language learning and active participation within the EFL classroom.

2.8.3. Balancing Learning Needs

Instructors can adopt a hybrid approach using the flipped classroom to balance introverted and extroverted needs. For instance, they can begin the class with an individual reflection activity,

followed by group discussions and collaborative projects that cater to extroverted preferences (Dörnyei & Ushioda, 2009). Both introverted and extroverted students can benefit from peer teaching and tutoring, which can be facilitated during in-class sessions. This approach fosters collaboration, allowing students to learn from each other's strengths and diverse perspectives (Ehrman & Oxford, 1995).

Further, to guarantee the congruence of assessment techniques with the flipped classroom approach, instructors can integrate a combination of individual evaluations (such as quizzes and essays) and collaborative assessments (including presentations and group projects). This approach accommodates the varied strengths exhibited by introverted and extroverted learners (Dörnyei, 2005).

The flipped classroom model offers a dynamic and adaptable approach to meet the diverse learning preferences of introverted and extroverted EFL learners. By providing opportunities for both independent study and collaborative activities, teachers can create an inclusive learning environment that capitalizes on each student's strengths, ultimately enhancing language acquisition and engagement (Dörnyei & Ushioda, 2009).

Conclusion

This chapter has been a comprehensive journey through the intricate landscape of introversion and extroversion within the realm of EFL learning. It has revealed the profound influence of these personality traits on language learning, classroom dynamics, and teaching methodologies, highlighting the paramount importance of recognizing and accommodating diverse personality types for optimizing language learning outcomes. Our investigation commenced with an examination of the theoretical underpinnings of introversion and extroversion, tracing their inception from Carl Jung's seminal contributions to contemporary viewpoints. Furthermore, the

chapter delved into historical perspectives regarding the evolution of extroversion and introversion, shedding light on the evolution of these concepts in psychology and their subsequent application in language education.

To provide educators with a comprehensive toolkit for identifying these traits among language learners, we delved into methods and instruments to assess introversion and extroversion in EFL learners, including various assessment tools such as self-report questionnaires, observation, and neurobiological measures. We also explored how introverted and extroverted EFL learners engage with language learning, revealing the distinct preferences, challenges, and strategies employed by these learners. This insight underscores the need for tailored instructional approaches. In addition, our examination of the impact of personality types on language proficiency, engagement, and learning strategies revealed that introversion and extroversion significantly influence language proficiency, student engagement, and the choice of learning strategies.

The interaction of introverted and extroverted EFL learners in classroom settings unveiled intricate dynamics at play, including classroom participation, group activities, teacher-student interactions, and peer communication. Recognizing these dynamics can foster a more inclusive classroom environment. To meet the diverse needs of both introverted and extroverted learners, we explored various teaching methods to accommodate diverse personality types. These strategies empower educators to create inclusive and effective language learning environments, from the flipped classroom approach to project-based learning and peer teaching.

A significant portion of this chapter was dedicated to using the flipped classroom model with introverts and extroverts, offering a nuanced perspective on how this model can create a harmonious learning environment by fostering independent study, collaborative activities, and addressing individual learning needs.

In conclusion, in the complex tapestry of EFL learning, the recognition and accommodation of diverse personality types, characterized by introversion and extroversion, serves as catalysts for enhanced language learning and engagement. Educators are encouraged to embrace this diversity, leveraging it as an asset rather than a challenge. As we conclude this exploration, the imperative remains clear: In the ever-evolving landscape of language education, the multifaceted nature of personality must always be at the forefront of pedagogical considerations, fostering an environment where every learner can flourish.

CHAPTER 3:

ENHANCING AND MEASURING EFL LEARNERS' ACADEMIC ENGAGEMENT

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ENGAGEMENT**

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Introduction

Students' engagement is receiving more importance in academic research. It has been linked to retention, student satisfaction, motivation, academic achievement, and social engagement (Carini et al., 2006; George D. Kuh et al., 2008). To be able to assess and increase students' engagement, however, it is necessary to understand the definition of students' engagement and its elements. This chapter examines the research on engagement, its definition, and interpretation in the past. It also deals with the relationship of engagement with Self Determination Theory and Self-System Model of Motivational Development.

Moreover, it discusses students' perceptions of their own engagement in learning and previous literature in this vein. This chapter also states previous NSSE and AUSSE research on student engagement. Furthermore, the relationship between student engagement and academic achievement is discussed. In the same vein, student engagement in blended learning settings is explained. Further in this chapter, a section defines EFL learners' academic engagement and analyses their engagement in online classes. Moreover, this chapter explores ways and instruments to measure students' engagement across different dimensions, focusing on the University Students Engagement Inventory (USEI) as a significant instrument used in this study. Last but not least, several methods and approaches are discussed to increase EFL students' engagement and overcome the obstacles that can hinder their engagement.

3.1. Student Engagement

The term student engagement is described as the emotional qualities and active participation of a student during the process of learning (Reeve et al., 2004). There are various typologies of engagement in the reviewed literature, and some scholars have employed a two-part typology of engagement, distinguishing emotional and behavioral components of this construct (van Uden et

al., 2013). Others see engagement as having three components: behavioral, emotional, and cognitive (Fredricks et al., 2005). Each component correlates with the other in the later model, and the three create a single composite construct. Behavioral engagement in this typology refers to active involvement or participation in learning-related activities like asking questions in class and completing assignments. Emotional engagement is concerned with the affective reactions of students during the process of learning. Adopting complex learning tactics such as conceptual comprehension over superficial knowledge is referred to as cognitive engagement.

Reeve and Tseng (2011) claimed that this three-dimensional model of engagement overlooks learners' active, constructive contributions to their educational activities, like making suggestions and providing input, which he refers to as agentic engagement. More study is needed, however, to discover whether or not agentic engagement differs from other types of engagement and predicts outcomes differently from the three dimensions identified (Eccles, 2016).

In the same vein, engagement is defined as three closely linked but conceptually distinct dimensions: behavioral, emotional, and cognitive by Fredricks and McColsky (2012). The term "behavioral engagement" refers to how students engage in various learning and instructional activities. Participating in class events, attending classes, following regulations, and completing tasks are all noteworthy behaviors. Emotional engagement refers to students' feelings about their interactions with classmates and their sense of belonging. The level of interest a student has in learning is defined by cognitive engagement (Zake et al. in Purnawarman, Susilawati, & Sundayana 2016). Motivation is also an important factor in language learning. The importance of motivation in creating positive affective factors that enhance language learning cannot be neglected (Bley-Vroman in Anis & Anwar, 2020).

Yamada (2018) defines student engagement in the prior literature by reviewing the terminologies used to explain it. He defines student engagement as 1) the educational system and environment that universities provide, taking into account students' situations and contexts, to increase their learning and development, 2) the deep commitment that teaching and administrative staff make in their daily instruction and guidance, 3) the process and series of experiences that students choose on their own to be proactive in their learning, and 4) the interconnectedness and dynamics between quantity and quality.

Self-Determination Theory (SDT) provides a theoretical framework for understanding how the social context of the classroom can influence learners' motivational experiences (Ryan & Deci, 2017). Nevertheless, this theory does not serve as an indicator of the role of engagement in the motivational system of learners. Many scholars (Skinner et al., 2008; Skinner et al., 2009), with the purpose of linking several motivation theories, suggested the Self-System Model of Motivational Development (SSMMD) as a framework for plausibly integrating classroom engagement to other motivation factors recognized by other theories of human motivation, primarily SDT (Figure 12).

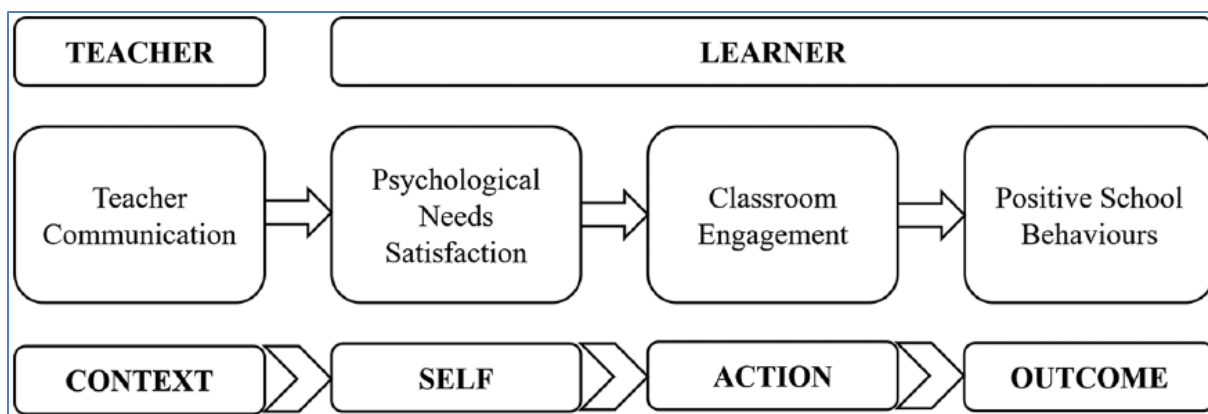
There are four classifications of motivational variables in this integrated model. Context variables pertain to learners' social environment, which includes parents, teachers, and classmates. Learners' values, abilities, beliefs, and attitudes, specifically their views of how well their needs for competence, relatedness, and autonomy are met, are referred to as self-variables. The third category, action, is concerned with goal-directed activities, specifically, participation in a learning activity. The model's final component is the outcome, which in the educational realm is represented by cognitive development and learning.

The SSMMD discusses, through its four components, the process by which the basic psychological needs established by SDT as significant features of the self are influenced by context and, as a consequence, impact engagement and related outcomes.

More precisely, the more teachers' behaviors and classroom dynamics fulfill learners' needs for competence, relatedness, and autonomy, the more learners actively participate in their educational activities, allowing them to learn more and demonstrate higher academic achievement (Connell & Wellborn, 1991; Dincer et al., 2012; Noels et al., 2016; Reeve, 2012; Ryan & Deci, 2000). Engagement thus mediates the link between psychological needs and learning outcomes (Skinner et al., 2008, 2009).

Figure 12.

The Self-System Model of Motivational Development



Note. This model was demonstrated by Skinner et al. (2008; 2009)

Furthermore, numerous studies favor the notion that engagement serves as a mediator in the relationships between self, behavior, social context, and results (Connell & Wellborn, 1991; Noels, 2015; Patrick et al., 2007; Skinner & Edge, 2002; Skinner et al., 2009). The SSMMD is comparable to other social context-focused language learning motivational models, such as Noels et al.'s (2016) socio-ecological model and Gardner's (1985, 2010) socio-educational model.

3.2. Students' Perception of Their Engagement in Learning

Since the 1990s, student engagement has emerged as a significant metric for institutional evaluation in the US. As the array of studies on student engagement has expanded, so too have theories, conceptual frameworks, and predominant perspectives. Among these, the behavioral approach, which elucidates the correlations between student conduct and instructional methodologies, has garnered considerable scholarly attention. The National Survey of Student Engagement (NSSE), administered by the Center for Postsecondary Research within the Indiana University School of Education, stands as one exemplar survey method used to explore these relationships. Another notable method is the Australian Survey of Student Engagement (AUSSE), conducted by the Australian Council for Educational Research (Bryson, 2014).

The NSSE's five engagement scales are primarily focused on educational approaches, including academic challenges, interactions, active learning, a supportive learning environment, and enriched educational experiences. The AUSSE, on the other hand, is concerned with educational outcomes such as higher-order thinking (including critical thinking and problem-solving), grades, general learning outcomes, career preparation, satisfaction, and intention to leave. The NSSE and AUSSE are referred to as The Dominant Paradigm (Bryson, 2014).

Kuh (2001), one of the creators of the NSSE, addressed the reliability, credibility, and validity of self-reported data, whereas certain scholars raised concerns regarding potential weaknesses in student responses, the diversity of learning styles, and the focus across various disciplines (Kahu, 2013). She also claims that in order to fully characterize the idea of engagement, we must consider not only the behavioral perspective, as represented by academic challenge and active learning, but also other psychological, social-cultural, and holistic aspects. Psychological aspects, for example, include emotional and cognitive components.

3.3. Previous Research on Student Engagement

The following are some prominent previous research works conducted on students' engagement in learning contexts.

3.3.1. The NSSE Research

The NSSE study conducted in 2014, exploring the engagement levels of freshmen and seniors across 622 four-year colleges in the US, unveiled the subsequent results: student experiences in college and interactions with instructors vary across colleges and are not related to college size or complexity degree to enter. The number of advising sessions with their academic advisor in their first year has a positive correlation with student perception of the supportive atmosphere offered by colleges, as well as the usage of social media in their learning which in turn is positively correlated with all aspects related to their engagement (Kahu, 2013).

3.3.2. The AUSSE Research

Between 2008 and 2011, AUSSE issued a series of AUSSE Research Briefing reports, Volume 1-12, with varying emphases. Volume 6 from 2010, for example, reveals that one in every fifteen first-year students in Australia intends to transfer to another university. In terms of their experiences, first-year students in Australia are less likely than their counterparts in the United States to ask questions in class, make class presentations, or participate in community-based projects. Furthermore, data demonstrates that first-year students in Australia and New Zealand discuss their grades and career ambitions with teachers far less than first-year students in the United States. A more extensive analysis based on their disciplines reveals that science students spend more time remembering facts, engineering students putting theories into practice, and humanities students analyzing (Hagel et al., 2012).

3.4. Student Engagement and Academic Performance

According to the Student Involvement Theory, the higher the student's involvement in university, the higher the degree of student learning and personal growth (Astin, 1984). Being productively engaged is an integral approach for learners to create attitudes towards their teachers, peers, and universities that provide them with a sense of connection, affiliation, and belonging while also giving them abundant learning and development opportunities (Trowler & Trowler, 2010). The amount of time and energy students dedicate to educationally relevant activities is the sole most accurate indicator of their learning and professional growth. Universities that fully engage their students in a range of activities that contribute to desirable educational outcomes might claim to be of greater quality than other universities with less engaged students (Kuh, 2001).

Students' engagement has also been recognized as an essential factor in explaining dropouts, primarily as a gradual transition functioning in students' lives and affecting their choice of dropping out (Jimerson et al., 2009). It has also been a key to tackling issues of boredom, low achievement, high rates of dropout, and alienation in academic settings (Frederick et al., 2004). Additionally, it has been associated with higher academic performance and has consistently proven to be a reliable indicator of achievement and conduct in educational settings (Appleton et al., 2008).

Understanding students' engagement and disengagement in higher education institutions is becoming increasingly important. Examining the variables that influence engagement and disengagement can reveal information on students' performance, advancement, and commitment. Engagement assessment may help evaluate the effectiveness of students' learning experiences and make choices about available resources, course content, and delivery (Coates, 2007).

3.5. Student Engagement and Blended Learning

Despite the fact that there has never been a clear, agreed-upon definition of students' engagement, scholars concur that it is a multidimensional, complicated notion with two or three separate sub-constructs that are demonstrated by a variety of indicators. Two of these sub-constructs, emotional engagement, and cognitive engagement, have been highlighted as being extremely significant and pertinent to blended learning (Halverson & Graham, 2019).

Students' engagement and the blended learning approach are strongly related. According to researchers, one factor driving blended learning's rise in popularity is the idea that it can boost student engagement (Garrison & Kanuka, 2004). Studies on student engagement in blended learning environments are becoming more and more prevalent.

Delialioğlu (2012) created lecture-based blended learning and problem-based blended learning. After the implementation and comparison between these two and after repeatedly measuring ANOVA analysis on data, it showed that the indicators of students' engagement were considerably higher in problem-based blended learning than in lecture-based blended learning. Regression analysis demonstrated that the learning environment in problem-based blended learning is what makes a difference in active learning. Moreover, after gathering data from focus groups, student surveys, and other data sources, Sahni's (2019) findings demonstrate that students in the blended learning group do better in achieving outcomes and overall engagement with both online and in-class activities. Furthermore, according to Li et al. (2021), face-to-face class attendance positively correlates with virtual learning engagement, and both of these factors are positively correlated with academic achievement.

Although studies have shown that student engagement is essential to acquiring new information and skills, there have always been issues with the integration of blended learning

(Ma'arop & Embi, 2016). Learners' characteristics and the learning platform features or social media tools should be the two main focuses. Tay (2016) discovered that in order to increase cognitive, behavioral, and social engagement, designers of blended learning lessons need to take into account both the learner's and the online platform's characteristics. A questionnaire was used by Bo et al. (2020) to investigate the connection between course satisfaction based on engagement and students' perceptions of the blended learning platform. Their findings suggest that students' emotional engagement and how they perceive the blended learning platform have an impact on satisfaction in the blended learning mode. Nevertheless, in blended learning, students' cognitive and emotional engagement is more directly influenced by the platform's perceived usefulness. 42 peer-reviewed works in the arts and humanities from 2007 to 2016 were examined by Bedenlier et al. (2020). The findings show that blended learning improves student engagement with educational technologies. The best engagement boosters were blogs, mobile learning, and evaluation tools.

Activities in a blended learning setting should support and include learners' autonomy. Good language learners should be autonomous, able to create learning objectives, choose their own methods and approaches, keep track of their progress, and assess their learning. They can also come up with creative solutions on their own and discover new things. The capacity to direct one's own learning is, in essence, what Holec (1981) characterized as learner autonomy. However, students do not always claim control of their education, and they may find it difficult to critically reflect on their own learning. Therefore, teachers should create activities that foster learner autonomy in order to increase student engagement in education. When creating activities that promote learner autonomy, three factors, namely technological, psychological, and social-cultural factors, might be taken into account (Oxford, 2003). In blended learning, a technological viewpoint enables us to

understand the roles that contemporary technology and social media play in distributing and delivering knowledge. The psychological approach calls for an emphasis on students' need for accomplishment, need for purpose in life, good attitudes, and both intrinsic and extrinsic motivation. Teachers must view students from a social and cultural standpoint as independent individuals who will grow via contact with more competent mediators in a given situation.

Students can connect with peers and instructors during online activities in blended learning courses at any time and any location that they want, depending on their circumstances, thanks to the use of social media. After the topic has been presented to the students for the online discussion activity, they may first think independently about how to reply to the subject, and then they can visit the website to further their research and develop their own opinions. They can then choose when to post their ideas in the group. Students are in charge of the entire learning process and are accountable for their own learning.

Before participating in face-to-face classroom activities in blended learning, like Teachers' Q & A, students may initially independently read the text's paragraphs and translate them. After that, it will be up to them to decide whether or not they want to participate in the teacher-led discussions. Making students aware of their responsibility for carrying out the activity is a key component of creating activities to foster autonomy and is seen as a critical element in helping learners build their autonomy (Wenden, 1991).

3.6. EFL Students Engagement

Traditional teaching tactics are frequently repetitive, which can lead to students' poor performance and lack of interest. Classroom exercises, therefore, can be frustrating and time-consuming for EFL students (Mahboob & Elyas, 2014).

The strategies of Merdeka Belajar can be applied to EFL teaching in order to boost students' motivation and interest in studying English. It is an innovative approach to teaching English that makes use of the Self-Organized Teaching-Learning Environment (SOLE) technique. Sugata Mitra, the theory's originator, successfully tested SOLE's concept within India (Anis & Anwar, 2020).

It is crucial to understand the aspects of students' learning engagement. Students' and teachers' engagement conceptualizations, according to Zhang and McNamara (2018), highlight three primary areas of interaction: behaviors, relationships, and motivations. These interactions stimulate students' interest in learning.

Students who demonstrate intrinsic and extrinsic motivation show commitment, routine, and engagement. Intrinsic motivation increases authentic student learning engagement when pedagogical reciprocity occurs. Students with both types of motivation demonstrate distinct kinds of learning engagement (Saeed & Zyngier, 2012). They believe that disengaged students may do their tasks, but they do so without interest or dedication.

Teachers can explore utilizing extrinsic motivation to increase intrinsic motivation in their students. Students who are motivated and engaged study more effectively (Bundick et al., 2014). Respectful relationships and contacts, both virtual and personal, are exemplified in order to increase student involvement. After investigating students, their ideal school appearance, and what learning environment promotes interaction, students identified three requirements that correspond to the concept of interaction: (1) Learn from and with one another and members of their community; (2) Engage with professionals and experts; and (3) Offer greater opportunities for discussion and communication. (Dunleavy & Milton, 2009). Hence, the benefit of more active learning environments is increased student engagement. Teachers can take an active part in promoting

student involvement (Bundick et al., 2014). Teachers should understand and be accountable for developing educational activities that foster intrinsic motivation. Teachers can also make classrooms a more engaging place for students to learn by employing appropriate pedagogies (Saeed & Zyngier, 2012). Suherdi (2018) is researching an alternative system dubbed SMSLEFA for the Research Learning Interaction Framework for Synergistic Multi-layered Students. It revealed that SMSLEFA successfully described the SLE by a synergistic multilayering approach.

Relationships that are open, compassionate, and supportive are necessary for social and psychological learning engagement. Teachers should understand and be accountable for designing educational activities that foster intrinsic motivation. Students today require social engagement in order to learn (Willms, Friesen, & Milton, 2009). Students who experience a positive disciplinary climate are half as likely to report high levels of interest, motivation, and learning satisfaction. Furthermore, exploration increases student learning engagement. Learners must have the following factors in order to engage: importance, obligation, truth, and reality (Claxton, 2007). Today's learners expect their education to be as relevant to real-life settings as feasible. Working with authentic issues or group issues engages students and adds significance to their lives. Accordingly, successful teaching is distinguished by the careful design of learning activities that have such elements.

Teachers report that technology improves student engagement elements. Cell phones, tablets, and laptops can increase class engagement by up to 78%. Students are motivated to learn when they use classroom technology and develop important 21st-century skills like creativity and problem-solving. As a result, technology provides learners with relevant topics and expertise, as well as a tool for active learning. Multimedia and technology have aided in student engagement. According to Purnawarman et al. (2016), technology is employed to improve students' learning

habits and learning chances. Online learning suffers due to a lack of planning and organization. Students who have a high level of self-confidence, independence, and learning autonomy can easily access English classes (Anis & Anwar, 2020).

Students' engagement in online learning is critical to its success. It influences students' interest levels, motivation, and satisfaction with learning outcomes. Since students' learning engagement may promote learning achievement, the learning outcome is attained.

3.6.1. Student Engagement in an Online EFL Classroom

Several previous research has provided evidence for the significance of engagement in affecting students' academic achievement, such as learning success and the teaching-learning process. Engagement goals were to attain students' learning achievement by devoting their time and effort to activities that directly contribute to their learning (Krause & Coates, 2008). Research confirmed that students' engagement with active participation occurred during their time in the classroom (Trowler, 2010; Susanti, 2020). Abbing (2013) and Zohud (2015) demonstrated that student engagement has a significant effect on student language achievement. Moreover, Ginting (2020), who mentions his experience in teaching English online, recommends using an inquiry community approach to increase student engagement in online classes.

According to Zohud (2015), using numerous strategies and media in the classroom makes students become much more active and engaged in the learning process and learn better. Dewi et al. (2020) discovered that using Google Classroom as a learning tool to improve students' reading comprehension is extremely beneficial since students can learn with more access by using their smartphones without the limitation of time and place. However, according to Coates' (2005) research, posting lecture notes or audio streaming online is not a substitute for successful lecturing. That is, the cognitive engagement disrupted throughout the online session was the students'

opportunity to discuss their thoughts and learn cooperatively and collaboratively. Students' reactions indicate that even if entire lecture notes are available online, students will attend lectures provided they are entertaining and well-presented. Contact with professors and peers is essential. Ginting (2020) proposed mentioning the names of students who take online classes to address this deficiency since it can foster solid social relationships. This supports Dewi et al.'s (2020) conclusion about students' impressions of Google Classroom, as it demonstrated that some students preferred to learn in the offline classroom because they could engage directly and easily with the teacher.

In the online class, students' emotional engagement is high, particularly in dealing with their anxiety about making mistakes. As a result, they choose to remain mute and not participate in class. As a result, when lecture content is made available online, professors must devise techniques to boost students' engagement during lectures (Krause,2005).

According to Filius et al. (2018), giving students the confidence to take on the teacher role was generally effective since this trust let students see themselves positively, raised their self-confidence, and inspired them to engage actively.

Moreover, promoting the instructor's presence in online classes by clarifying the lesson rules can boost students' engagement in the way that they actively interact throughout the online class. This can be accomplished by, for instance, outlining what students must and should not do (Ginting, 2020).

3.7. Measuring Students Engagement

Since the design of education requires a thorough assessment of the effectiveness of instructional interventions, measuring student engagement is essential. The assessment of student engagement, however, has long been a challenge for academics since it is thought to be flexible

and unstable across learning circumstances and academic disciplines. Most current research relies on quantitative self-reports, such as surveys, scales, or questionnaires. Other approaches include quantitative observational measures (like the number of assignments handed in) and bio-physiological sensors (like eye movement monitoring) in addition to qualitative measures (like interviews and discourse analysis) (Henrie et al., 2015). Each of these measurement methods has benefits and drawbacks of its own. For instance, quantitative self-reporting can be easily distributed, helpful for self-perception, and less observable engagement indicators. However, if frequent repeated measures are required, it may be boring and intrusive during class time. While an interview can enable data collection without impeding learning, scaling it is challenging. Thus, some academics have recommended mixed research methodologies that could incorporate the benefits of several methods, particularly for engagement research in blended learning, where there are two learning channels.

The Fredricks et al. (2002) engagement scale, the Student Engagement Instrument (SEI), the Community College Survey on Student Engagement (CCSSE), the Rochester Assessment Package for Schools (RAPS), and the National Survey on Student Engagement are a few of the well-established self-report instruments that measure academic engagement. Middle and high school students have validated the Student Engagement Instrument (SEI) for evaluating cognitive and emotional engagement. Additionally, primary schools frequently employ the Rochester Assessment Package for Schools (RAPS) to evaluate students' behavioral and emotional engagement. Students in primary schools have also been measured for engagement using the Fredricks et al. (2002) engagement scale. Furthermore, community college students are subjected to an online survey every year called the Community College Survey on Student Engagement

(CCSSE). Likewise, college students' participation is measured by the National Survey on Student Engagement (NSSE) each year (Appleton et al., 2006).

Since there are many diverse definitions of engagement—both within and among its various types—this might well be problematic because engagement is a broad meta-construct (Fredricks et al., 2016). The research has shown two main conceptualizations of academic participation. In order to measure student engagement in academic contexts, Schaufeli et al. (2002) modified the Utrecht Work Engagement Scale (UWES) from the perspective of business organizations. By rephrasing some of the original UWES items, the modified scale, known as the UWES - Student version (UWES- S), uses the same three work engagement aspects (vigor, absorption, and dedication). Academic engagement is also defined as a multidimensional construct by Fredricks et al. (2004), integrating behavioral, emotional, and cognitive dimensions. Christensen (2017) states that this definition is typically in line with the idea that the behavioral component relates to vigor, emotional engagement to dedication, and cognitive engagement to absorption. Nevertheless, the conceptualizations of student academic engagement by Schaufeli et al. (2002) and Fredricks et al. (2004) have drawn criticism. The latter was developed primarily for high school pupils, while the former was a straightforward adaption of the workplace to the university setting (Marôco et al. 2016). A more accurate generalization and comprehension of academic engagement as a composite of its many elements is made possible by theorizing it as a multidimensional concept. Additionally, examining the behavioral, emotional, and cognitive engagement first-order components allows for the identification of the various contributions to overall engagement and enables targeted treatments.

Due to some theoretical frameworks overlapping with earlier literature, clarification is required (Fredricks 2015). It is necessary to differentiate between the dimensions in the adopted

framework and provide precise descriptions in the literature on academic engagement (Fredricks et al. 2004). Analyzing the validity evidence of multidimensional psychometric instruments becomes more useful when the significance of having measures that account for this without crossing the content of various variables' dimensions is emphasized.

3.7.1. The University Student Engagement Inventory (USEI)

The University Student Engagement Inventory (USEI) was created by Marôco et al. (2016) after reviewing the primary critiques of both approaches. This inventory focuses on academic engagement on the behavioral, cognitive, and emotional levels, which is how most research defines and categorizes these aspects (Fredricks 2015).

The behavioral dimension relates to actions like showing up for class, being punctual, completing given work and assignments on time, engaging in events inside and outside of the classroom, and following institutional and societal regulations. The term "cognitive dimension" refers to all of a student's ideas, perceptions, and strategies linked to information acquisition or the development of academic competencies, such as their study techniques, instructional strategies, and academic self-regulation. The emotional dimension refers to both positive and negative feelings and emotions that are connected to the learning process, classroom activities, peers, and teachers. Examples of such feelings include motivation, enthusiasm, and a sense of belonging (Antúnez et al., 2017; Carter et al., 2012; Marôco et al., 2016; Sheppard, 2011).

According to Marco et al. (2016), the USEI is a 15-item self-report Likert-type scale that ranges from 1 = "never" to 5 = "always". It contains three dimensions measuring academic engagement: behavioral (BE; for example, I often participate actively in group work), cognitive (CE; for example, I appreciate being at school), and emotional (EE; for example, I try to integrate the acquired knowledge in solving new problems). This instrument provided strong evidence of

reliability and factorial, convergent, and discriminant validity in previous research studies. Exploratory and confirmatory factor analyses systematically confirm specific items for each dimension. The reliability coefficients for items' consistency are listed above. .63 (ordinal omega values) for two dimensions and above .69 for three dimensions (ordinal alpha values) (Marôco et al., 2016).

3.8. Increasing the Engagement of EFL Learners

Much research has been done to investigate effective teaching strategies for improving EFL learners' language skills, literacy, and academic achievement. Body language and sign language (Konishi, 2007; Sime, 2006), video-self-modeling and digital technologies (Ortiz et al., 2012; Wilson et al., 2012), music (Miranda, 2011; Paquette & Rieg, 2008), and family engagement have all been used (Farver et al., 2013; Harper & Pelletier, 2010).

In addition to these efficient practices, using positive emotional experiences in the classroom can help instructors deal with the obstacles they face. Positive emotional experiences that improve learning are referred to as "emotional scaffolding," a term that combines Vygotsky's notion of "scaffolding" with an understanding of the importance of emotion in the learning process (Meyer & Turner, 2007).

Cognitive scientists studying the structure and function of the brain have shown that emotion and cognition interact in the learning process in a densely interconnected way (Damasio, 1999; Willis, 2007). According to the literature, emotion plays a critical role in moderating the acquisition of academic knowledge and skills during the learning process.

Learning outcomes are more optimal and successful when emotion and cognition are incorporated in teaching and learning environments (Meyer & Turner, 2007; Op't Eynde & Turner,

2006). The literature confirms that emotional scaffolding in learning can be an effective teaching tool.

Considering the importance of engagement, it is essential to place it within a broader motivational paradigm (Christenson et al., 2012). Self-Determination Theory is one relevant theory that takes a holistic approach to motivation. It suggests that self-processing dynamics determine the engagement's nature and extent (Ryan & Deci, 2017).

People have universal, fundamental psychological demands for competence (a feeling of being effective), relatedness (a feeling of being emotionally connected with others), and autonomy (a feeling of being self-governed and self-initiating in activities), according to the SDT. People are more likely to engage in relevant tasks when their psychological needs are addressed through interaction with others in their social setting. The quality of student-teacher relationships and the general classroom atmosphere can have an impact on students' psychological needs in learning (Jang et al., 2016; Reeve, 2013; Ryan & Deci, 2016).

3.8.1. Increasing EFL Learners' Engagement Using Facebook Groups

The growth of information and communication technology (ICT) has revolutionized English instruction for EFL students (Cequena, 2013). If students were previously accustomed to conventional English language instruction offered inside the classroom limits, the scenario has shifted radically with the development of contemporary technology. Students in the twenty-first century now carry portable and handheld electronic and smart devices such as laptops, phones, tablets, phablets, netbooks, iPads, and other devices they use daily for school and personal purposes. This constant fingertip access to information enables students to surf the World Wide Web, stay up to date, and engage interpersonally with anybody, anytime, and anywhere in virtual places. This tendency extends to the academic realm; in fact, research has revealed how the World

Wide Web, the Internet, and other communication technologies have fostered significant educational experiences over the previous decade (Low & Warawudhi, 2016).

As a result, with technological innovation dominating and penetrating the world, it is essential that English education, particularly among EFL learners, be engaging, responsive, and relevant to make language learning more relevant to the students. Educators may now use social networking sites, including Facebook, Twitter, YouTube, Instagram, Google Hangout, Pinterest, and others, to help students improve their English language skills. Among these sites, Facebook is one of the most popular for students' virtual social activities (Auxier & Anderson, 2021).

Low and Warawudhi (2016) assert that using Facebook groups has the pedagogical potential to manage large classes and to provide enhanced engagement among students and instructors outside of the physical classroom through virtual places. Because of its pervasiveness and popularity among students, Facebook serves as an online meeting place for instructors and students. Since everyone is using Facebook, it is simple for instructors to form an online community and invite students to join and become members. Facebook groups could be used as a class management system, allowing instructors to establish an exclusive virtual place, similar to an online classroom, and utilize it to supplement the physical classroom.

Furthermore, according to Shih (2013), integrating Facebook using a blended learning approach, such as Horn and Staker's (2014) flex model, can assist enhance students' interest and motivation in learning the lesson and support them with their classroom activities. This model blends face-to-face or in-class instruction with offline or out-of-class interaction; the instructor may upload learning materials as review tools, post relevant websites for increased input, and contact students for consultations. Consequently, students feel engaged and invested in classroom occurrences, which may result in continuity of learning.

Conclusion

This chapter offers comprehensive definitions of engagement, student engagement, and engagement among EFL learners. Student engagement is defined as the emotional commitment and active involvement of students in the learning process, supported by a thorough literature review. The chapter discusses students' perceptions of their own engagement and highlights prominent research, including studies from NSSE and AUSSE, illustrating engagement patterns across colleges in the United States and Australia. It also explores the relationship between students' engagement and academic achievement, drawing on the Student Involvement Theory to emphasize the link between student involvement, learning, and personal growth. Additionally, the chapter examines the connection between engagement and the blended learning approach, emphasizing their interdependence. Moreover, it addresses online student engagement strategies and their alignment with Self-Determination Theory and the Self-System Model of Motivational Development. Various methods and instruments for measuring engagement, encompassing behavioral, emotional, and cognitive dimensions, are discussed, with the University Students Engagement Inventory (USEI) highlighted as a prominent assessment tool. Finally, the chapter concludes by proposing methods and approaches to enhance engagement among EFL learners, advocating for the integration of technological innovations to address challenges students may encounter in their educational experiences.

CHAPTER 4:

RESEARCH DESIGN AND METHODS

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Introduction

This chapter discusses the research design and methods used to develop and implement flipped course delivery. It also contains a restatement of the research questions and hypotheses. The research methodology also includes data and variable identification, instrumentation, and data collection. A description of the characteristics of the population is also included, along with the sampling techniques. Further, it demonstrates the data collection instruments used in the pre-test and post-test. The experimental phase is explained in detail along with the lesson plans used in the experiment. Moreover, this chapter presents the procedure of data collection, research validity and reliability, and ethical considerations.

4.1. Research Questions and Hypotheses

The current study is conducted for the sake of answering the following questions and testing the undermentioned hypotheses

4.1.1. Research Questions

This research strives to answer the following research questions:

- 1- What kind of relationship exists between the engagement of third-year introverted EFL students at the English Department of Guelma University and the flipped classroom model?
- 2- To what extent can elements of the flipped classroom model help enhance introverted EFL students' engagement through the case study of third-year students at the English Department of Guelma University?
- 3- How do third-year introverted EFL students at the English Department of Guelma University experience and perceive inverted classes?

4.1.2. Research Hypotheses

Following the raised research questions, this research strives to test the following hypotheses:

- 1- Flipping the classroom in the Algerian higher education context can improve introverted EFL students' engagement to a considerable extent due to the structured aspect of the flipped classroom.
- 2- Using educational technology and individual learning in a flipped classroom context can significantly enhance the engagement of third-year introverted EFL students at the English Department of Guelma University.
- 3- Introverted EFL students in the Algerian higher education setting enjoy the flipped classroom model as it supports individual learning.

4.2. Research Variables

This research consists of one dependent variable and two independent variables.

4.2.1. Dependent Variable

A dependent variable, according to Creswell (2012), is an attribute or trait that is dependent on or influenced by another. The dependent variable in this context is learners' engagement, which includes behavioral, emotional, and cognitive engagement. That is, it is the emotional qualities and active participation of a student during the process of learning. In this vein, the flipped classroom model is the instructional model expected to improve learners' engagement.

4.2.2. Independent Variables

According to Creswell (2012), an independent variable is an attribute or trait that influences or affects an outcome or a dependent variable. This study contains two independent variables; the first independent variable is the flipped classroom instructional model, and the second is

introversion as learners' personality type. The flipped classroom instruction entails integrating flipped learning principles into course design and delivery in the oral expression sessions.

4.3. Research Design

According to Creswell (2012), the research design is the precise methods involved in the research process, such as data collecting, data analysis, and report writing. Any sort of study adheres to scientific norms, and the research design is described as the collection of procedures used to develop and carry out a research project with consideration to reliability and validity. As a result, conducting research within a suitable design that fulfills the study's aim would ensure the feasibility and practicality of the entire study. In other words, the research design is the logical process that builds a relationship between the data obtained and the study's primary research questions and, consequently, a link to the study's findings (Yin, 2003). Thus, it helps the researcher to reach valid conclusions by answering the research questions and confirming or disconfirming hypotheses.

Accordingly, the current study comprises three distinctive designs. Each of the three designs is justifiable since it is supposed to accomplish a specific objective. The present investigation's primary purpose is to increase introverted EFL learners' engagement using a flipped classroom instructional model, which implies that the design is experimental in nature.

As a consequence, this study focuses on a specific case (third-year LMD English students at 8 Mai 1945 Guelma University), so it adopts a case study design. Furthermore, the research employs both quantitative and qualitative data-gathering tools, requiring the use of a mixed-methods design. The quantitative tools consist of a University Student Engagement Inventory (USEI) and a students' questionnaire while the qualitative tools comprise Myers–Briggs Type

Indicator (MBTI) and teachers' interviews. As a result, the current study is an experimental case study that employs a mixed-methods approach.

4.3.1. Experimental Design

Experimental research is distinguished by establishing a cause-effect connection between two variables, an independent variable, and a dependent variable. According to Cohen et al. (2000), experimental research involves a researcher interfering by changing one variable (the independent variable) and assessing the influence of that manipulation on another variable (the dependent variable).

According to Campbell and Stanley (1963), an experimental design is one in which an experimenter with perfect mastery may schedule treatments for maximum statistical efficiency, with the complexity of design deriving only from that purpose of efficiency. Therefore, the current study manipulates the integration of flipped classroom instruction, which is the independent variable, and aims to measure its influence on the engagement of third-year LMD English students, which stands as the dependent variable.

The four types of experimental designs are true-experimental design, quasi-experimental design, ex-post facto design, and factorial design. Nevertheless, the two most well-known and often implemented designs in educational research are true-experimental and quasi-experimental designs, both of which will be discussed.

The primary distinction between a true-experimental design and a quasi-experimental design is the assignment of the sample to the control and experimental groups. There is a substantial distinction between sample selection and sample assignment. On the one hand, the former refers to the process of selecting a sample randomly from the target population. The latter, on the other hand, refers to the procedure of randomly assigning participants from the sample chosen to either the

experimental or control groups. Since random selection is related to sampling, it is firmly bound to the external validity of the research, which is defined as the extent to which the findings are generalizable outside the sample used for the study (Lodico et al., 2006).

Randomly selecting the study sample means that every person in the target population has an equal chance of being chosen to participate in the study. Random assignment of participants is critical in any experimental research because it allows the researcher to maintain the study's internal validity, which is defined as "the degree or extent to which differences in the dependent variable are due to the experimental manipulation and not some extraneous variables." (Lodico et al., 2006, p.189).

In light of this, the primary distinction between a true-experimental design and a quasi-experimental design is the existence of random participant assignment in the former and its lack in the latter. According to Lodico et al. (2006), true-experimental research includes both a random selection and a random assignment of individual subjects to the experimental or control groups; however, a quasi-experimental study consists of a random assignment of intact groups to the control or experimental groups rather than individuals.

In the current study, an experimental design was used to test previously developed hypotheses drawn from theoretical considerations in order to assess the specific impact of deploying the flipped classroom instructional model in increasing learners' engagement. Creswell (2012) observes that experimental research methodologies are well-suited for studies in which researchers want to "test whether an educational practice or notion makes a difference for individuals" (p.21). In the same vein, Creswell (2012) goes on to say that the experimenters "assess this impact by giving one group one set of activities (called an intervention) and withholding the set from another group" (p.21).

For the present study, a true-experimental design was used due to opting for sample randomization, which is regarded as a prerequisite for conducting a true experiment. According to Mackey and Gass (2021, p.146), " Design types can range from truly experimental (with random assignment) to what is known as quasi-experimental (without random assignment)". In this study, random assignment of subjects to the intervention was convenient for the researcher. As a result, the true-experimental approach was used for this research.

4.3.2. True-Experimental Design

According to Cohen et al. (2007), the true-experimental design is helpful in examining educational issues. True experiments are research methods that follow true experimental processes in which the researcher observes single or multiple groups after a treatment variable that is expected to influence change. Non-equivalent groups are essential in true-experimental research. In this light, two groups are compared: one group receives the treatment, while the other does not. As a result, this design requires the two groups, EG (experimental group) and CG (control group), to complete a pre-test and a post-test (Cohen et al., 2007). The EG receives treatment, whereas the CG receives no treatment and acts as a reference scale for the EG's findings. The pre-test/post-test non-equivalent group design is used in this study to examine the change. Participants in the EG and CG were assigned randomly and random assignment of individual participants to the experimental and control groups was employed.

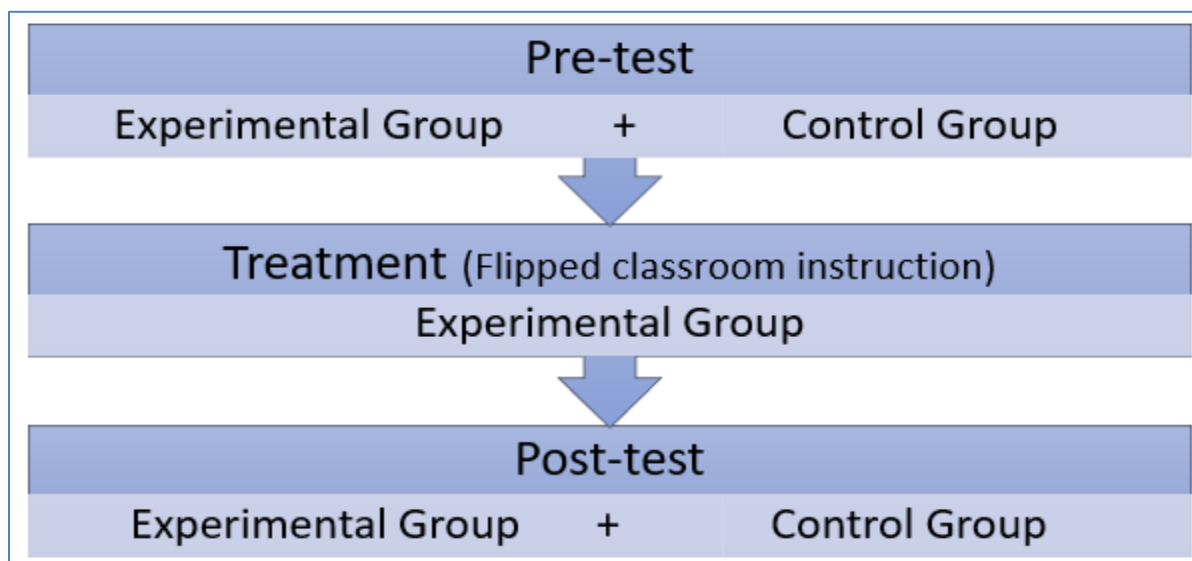
Experimental validity is a crucial element in research. There are two types of validity in research: internal validity and external validity. Internal validity, according to Best and Kahn (2006), is the extent to which the manipulated factors or independent variables have a substantial impact on the visible outcomes or dependent variables in the experimental setting. Whereas

external validity relates to how well the findings of a relationship between variables can be generalized to different populations, settings, treatments, and measurement variables.

As shown in Figure 13, the pre-test is the first step taken in this study. It allows the researcher to measure between-group differences before exposure to the intervention, and the pre-test is administered to both the EG and CG. The treatment refers to the intervention's undertaken procedures that are only applied to the EG. In the end, the final step is the post-test which is also administered to both EG and CG.

Figure 13.

True-Experimental Design



Creswell (2003) states that the primary goal of an experiment is to examine the impact of a treatment (or an intervention) on an outcome while controlling any other factors that may influence that result. Thus, the present design attempts to examine the impact of flipped classroom instruction on improving the engagement of introverted EFL learners. The manipulation of variables was undertaken by implementing flipped learning principles to stimulate learners' engagement.

4.3.3. Case Study Design

The present research is designed as a case study. A case study, according to Yin (2003), is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident " (p. 13). Case studies are intended to give an in-depth explanation of real-life phenomena by using unique instances of real people in real situations. According to Kumar (2004), a case study focuses on thoroughly investigating a small number of events or conditions and their interrelationships, requiring an intense assessment of the specific unit under review. According to Mackey and Gass (2021), case studies often try to comprehensively describe language learning or use within a particular population and environment.

Case study designs are valuable in research because they offer researchers a plethora of information about the phenomena being examined in a specific setting. First, case studies are strong in reality because they derive data from actual people in real-life circumstances, which is one of their main strengths. Moreover, they look into unusual events and characteristics that may be ignored in large-scale investigations. They also have the potential to offer insights into other comparable situations and instances, hence improving the interpretation of other similar cases. Additionally, they give clear findings and illustrations. Finally, they offer multiple data collection sources, allowing researchers to acquire in-depth insights into the topic being examined (Nisbet & Watt, 1984).

This study employs a case-study design because it is based on a particular case provided by third-year LMD students in the English department at 8 Mai 1945 Guelma University. The case study design was chosen with intent since it was planned to evaluate the impact of the flipped

classroom instructional model on the targeted population's engagement within the framework of the study utilizing a mixed methods approach.

4.3.4. Mixed-Methods Approach

According to Crotty (1998), the research approach of a study can be qualitative, quantitative, or both depending on the sort of research being conducted. In the current study, we must design a research procedure appropriate for our topic. The methodology used to answer the research questions and hypotheses combined qualitative and quantitative methods, known as the mixed methods approach. As a result, the methods applied should carefully match the research objectives, test the research hypotheses successfully, and provide correct answers to the research questions. In this regard, Creswell (2012) states, "Mixed methods designs are procedures for collecting, analyzing, and mixing both quantitative and qualitative data in a single study or in a multiphase series of studies" (p.22).

Each research methodology is defined by the type of data-collecting tools, the nature of the obtained data, and the way in which the data is analyzed. An experimental design employs a quantitative research technique since the primary instruments for this design are tests, which create statistical data used to test the specified research hypotheses. Nonetheless, the fact that the researchers are working with human subjects requires them to investigate the research participants' attitudes, perceptions, and reflections. Hence, in this work, a mixed-methods approach is employed. It entails using both qualitative and quantitative methods in the same research. The essential concept of this approach is that only a mix of quantitative and qualitative data allows the researcher to reach reliable findings that ultimately address the research questions (Creswell, 2014).

The benefits of using a mixed-methods approach can be summarized in the ability of this approach to improve data accuracy and offer a broader view of the phenomena under investigation

than a single approach would. Thereby it contributes to overcoming the shortcomings and biases of single approaches allowing the researcher to deepen the analysis and build on the original data Denscombe (2008).

Furthermore, the current study falls into the type of triangulation design since it adopts a mixed-methods approach. In this vein, Thurmond (2001) defines triangulation as a term used when elements of a project are investigated from two or more angles, that is, in our study, using two different approaches. Triangulation is about crossing the norms by mixing different methods from various models. Data source triangulation allows the researcher to compare one tool's findings to another (Denscombe, 2007). As a result, data collected can be both numerical (questionnaires) and textual (interviews), making the database both quantitative and qualitative (Creswell, 2003).

Similarly, Tashakkori and Creswell (2007) describe the mixed approach as a study or program of inquiry in which the investigator gathers and analyzes data, integrates the findings, and draws inferences utilizing both qualitative and quantitative techniques or methods. Therefore, triangulation improves credibility by validating the findings.

4.4. Research Setting

The present experimental research is a single-site study on third-year LMD students at the University of 8 Mai 1945 - Guelma, Faculty of Letters and Languages, Department of English, during the academic year 2021/2022.

4.4.1. Target Population

According to De Vos (2002), the population is the sum of people, events, organizational units, case records, or other sample units that are relevant to a specific research subject. It has to be set at the beginning of the research. The population of this study consists of third-year LMD students at the University of 8 Mai 1945 - Guelma, Faculty of Letters and Languages, Department

of English, during the academic year 2021/2022. The total number of third-year students in the English department is (229). Prior to conducting the research, the researcher requested and was granted access to the university.

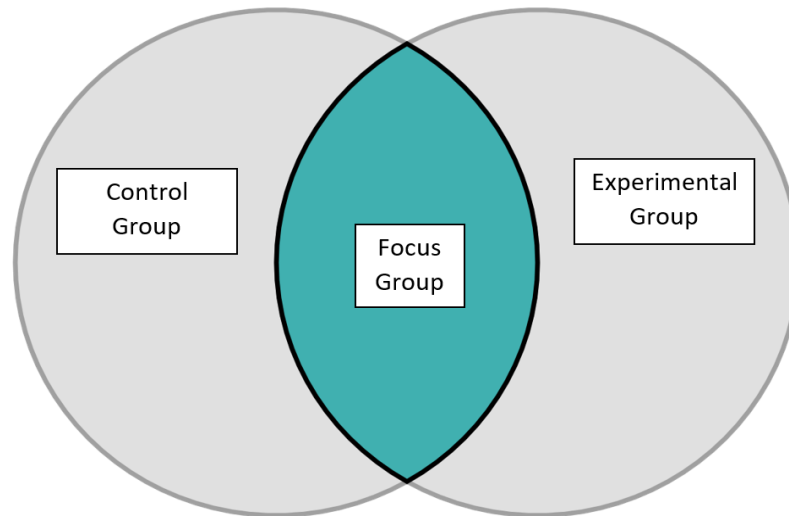
4.4.2. Research Sample

A sample in a research study is the group from which information is gathered. Sampling is the process of selecting a few from a bigger group to become the basis for predicting the existence of information, event, or outcome related to a larger group representing the population (Frankel et al., 2012).

The current study employed convenience sampling, which is a sample of people who are conveniently available for research (Fraenkel et al., 2012). The availability of naturally formed groups is the rationale. According to Denscombe (2010), some element of convenience is likely to come into the sample processes of most studies since researchers have limited money and time at their disposal. While the individuals were chosen using convenience sampling, the assignment of each group to the control or experimental groups was done randomly.

Figure 14.

Division of the Students' Sample Groups



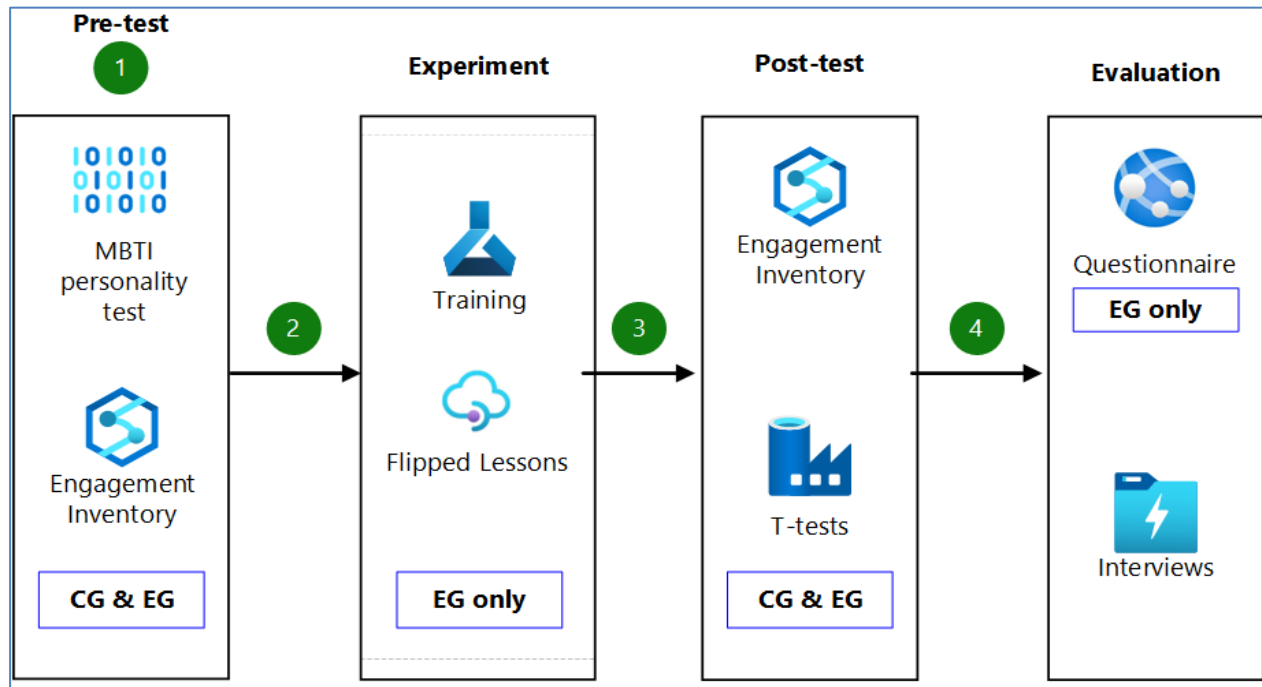
The first sample under study consisted of 111 third-year students at the English department, at Guelma University. It comprised two intact groups with the following student numbers: Group one (Experimental Group) comprises two sub-groups with a total number of 54 students, and Group two (Control Group) consists of two sub-groups with a total number of 57 students. The whole sample contains 82 females representing (73.87%) and 29 males representing (26.13%). A focus group is taken of each group of these, and each focus group contains introverted students (Figure 14).

The secondary sample of this study is dedicated to the interview as a tool of research. The sample represents five EFL teachers who used the flipped classroom as an instructional model from different Algerian Universities. There are no specific criteria for the choice of the subject matter (or module) that the teacher instructs.

4.5. Data Collection Instruments

This research uses a mixed-methods approach that involves both quantitative and qualitative methods for collecting data from both students and teachers. The main focus is on the quantitative research tools because they are designed to collect data that can help answer the main research questions of this study and test the research hypotheses about the impact of the intervention, that is, teaching through a flipped classroom instructional model. Some of the research tools were administered to both the control and experiment groups, while others were just used with the experimental group. In this respect, a personality test was given to determine the participants' personality types. Moreover, a pre-test and a post-test inventory were also used to measure the participants' level of engagement before and after the intervention, respectively.

Moreover, the students' perception of instruction questionnaire was administered after applying the treatment to gather participants' opinions and thoughts after their experiences. In addition, a semi-structured teachers' interview served as a tool for getting teachers' insights and experiences with using the flipped classroom in teaching. The tools were partitioned into segments to tackle distinct issues in the research. In this study, the researcher is also the teacher employing the flipped classroom instruction to the experimental group. The following figure (15) demonstrates the tools of research order to collect and assess the data from participants.

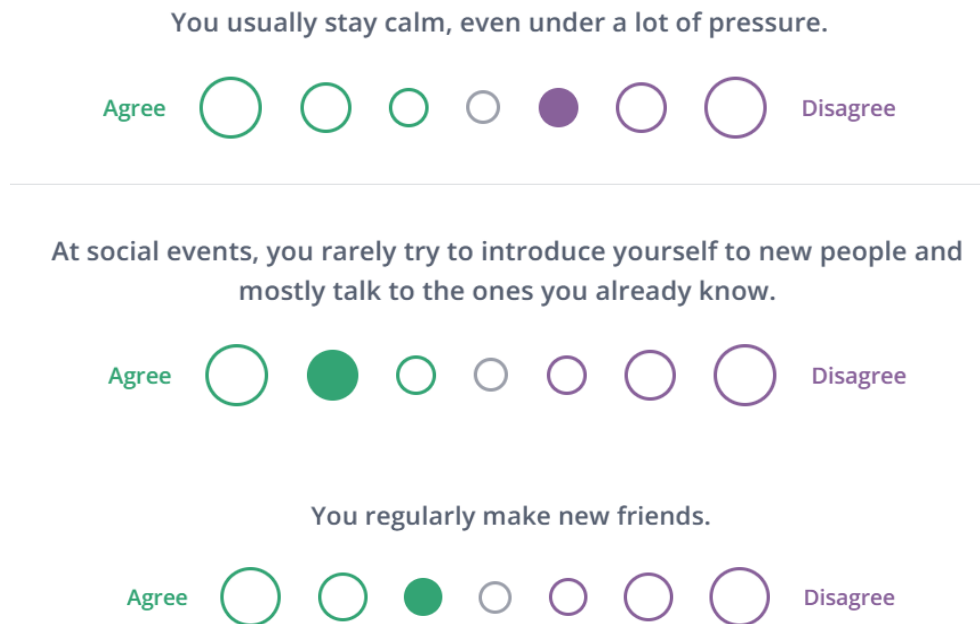
Figure 15.*Procedure of the Experiment***4.5.1. The Personality Test**

Before starting the experiment or treatment of the current study, conducting a personality test to determine students' personality types as introverts or extroverts is mandatory. The personality test chosen to carry out this research is the Myers and Briggs Personality Test, known as MBTI (Myers–Briggs Type Indicator). This test consists of 60 items and takes about 10-15 minutes to complete. The choice of introvert participants is determined by scaling their answers on the Myers and Briggs test (Myers, 1962). Consequently, the number of introverts and extroverts depends on the results of this test. The personality test was administered to both experimental and control groups. The experimental group consists of 54 students, 30 introverted students, and 24 extroverted students. The control group consists of 57 students, 31 introverted students, and 26

extroverted students. The following figure (16) demonstrates some examples of questions from the MBTI personality test.

Figure 16.

MBTI Personality Test Questions¹



4.5.2. Engagement Inventory

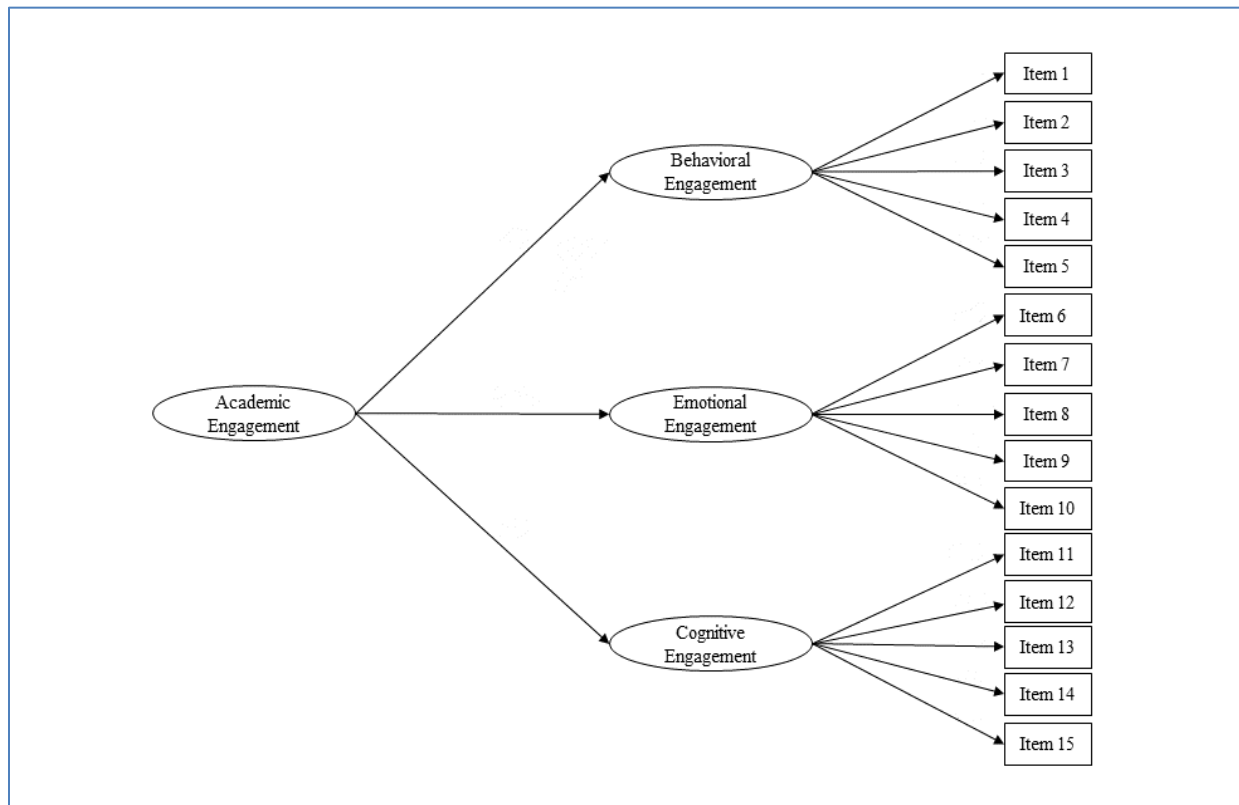
To measure students' engagement before and after applying the treatment, the researcher opted for the most suitable measuring tool for the current study considering the factors of validity and reliability. The researcher chose the University Student Engagement Inventory (USEI) for the mentioned purpose (see Appendix 1). Marôco et al. (2016) developed the University Student Engagement Inventory in response to criticisms of existing approaches. The USEI assesses

¹ Available at: <https://www.16personalities.com/free-personality-test>

academic engagement at the behavioral, cognitive, and emotional levels, which aligns with the commonly used definitions and classifications of these aspects (Fredricks 2015).

Antúnez et al. (2017), Carter et al. (2012), Marôco et al. (2016), and Sheppard (2011) describe three dimensions of academic engagement: behavioral, cognitive, and emotional. Behavioral engagement encompasses actions such as attending class, completing assignments on time, and following institutional rules. Cognitive engagement involves a student's thoughts and strategies related to learning and academic skills development, such as study techniques and self-regulation. Emotional engagement refers to a student's positive or negative feelings associated with the learning process, including motivation and a sense of belonging.

Marôco et al. (2016) developed the USEI, which is a 15-item self-report scale that measures academic engagement across three dimensions: behavioral, cognitive, and emotional. The items use a Likert-type response scale ranging from 1 (never) to 5 (always). The USEI has been shown to be a reliable and valid instrument in previous research studies, with solid evidence of factorial, convergent, and discriminant validity. Exploratory and confirmatory factor analyses were conducted to establish specific items for each dimension, with reliability coefficients above .63 (ordinal omega values) for two dimensions and above .69 (ordinal alpha values) for all three dimensions. The following figure (17) shows each dimension with the respective items of the inventory.

Figure 17.*University Student Engagement Inventory Dimensions*

Note. These dimensions are illustrated according to Marôco et al. (2016)

The USEI adopted from Appleton et al. (2006) and Maroco et al. (2016) was conducted to carry out this research for both the control and experimental groups to measure students' engagement before the implementation of the flipped model and after it. A general Information section was added at the beginning of the USEI, which dealt with students' names, groups, genders, and personality types. Then, students were instructed to use the response scale to indicate how often the 15 items apply to them.

For the pre-test, the USEI was distributed to 54 experimental group students and 58 control group students. Whereas, for the post-test, the USEI was distributed to 54 experimental group students and 57 control group students.

4.5.2.1. Piloting the USEI

In order to maintain the integrity and lucidity of scientific investigation, it is imperative to abide by established scientific protocols. Consequently, prior to distribution, a cohort of students drawn from the same sample group underwent a trial evaluation to test its effectiveness. The researcher was able to glean invaluable insights from this trial, which enabled them to ensure that all subsequent tests were successfully completed and returned by the students in class.

4.5.3. Students' Questionnaire

According to Dorney and Taguchi (2009), questionnaires are data collection instruments that follow a highly structured format designed to gather detailed and specific information, including personal details, using a range of response options such as ticking boxes, yes or no, and frequency. This data type is well-suited for quantitative analysis and can represent qualitative data with open-ended questions. Furthermore, the use of questionnaires allows researchers to select a large and representative sample, which enhances the research's validity. Further, the willingness of the participants to provide information has a significant impact on the research's validity (Singh, 2007).

For the purpose of the present study, a questionnaire was administered to third-year English students to investigate their engagement and attitudes toward the use of the flipped classroom instructional model (see Appendix 2). This questionnaire was administered to the experimental group only, that is, students who have received the treatment and were taught using the flipped classroom. The questionnaire, titled "Students' Perception of Instruction Questionnaire" was designed to collect students' opinions, perceptions, and thoughts about content and course delivery, communication, assessment and evaluation, and their learning experience with the flipped classroom. The questionnaire was completed by the participants themselves and was informed by

relevant literature and previous research in the field. The questionnaire consisted of a range of question types, including multiple-choice, dichotomous, open-ended, and Likert scale questions, all of which were carefully crafted to gather accurate information and provide answers to the research questions.

To gather data for the study, a questionnaire was distributed to third-year English students at the Department of English – 8 Mai 1945 University, Guelma. The sample of participants includes 54 students who received the treatment (taught via the flipped classroom). The questionnaire consisted of 16 items divided into five main sections. To ensure a well-organized process, the researcher distributed the questionnaire in class. The participants were given a clear and targeted set of questions to answer within 20 minutes. The researcher being the teacher ensured that all the questionnaires distributed were answered and returned by the students in class. All questionnaires (54) were distributed and returned; the number depended on the number of present students.

Section One: General Information

This section gathers participants' names, groups, genders, and personality types. This will contribute to the process of separating introverted and extroverted participants into two groups.

Section Two: Students' Perception

Most parts of this section are adopted from (Araño-Ocuaman, 2010) study, with considerable modifications. It includes Likert scale questions to capture students' perceptions of their learning experience, attempting to answer the third research question, "How do introverted EFL students experience and perceive inverted classes?". The Likert scale is composed of (16) items, and students are asked to indicate their level of agreement or disagreement with each statement.

Section Three: Students' Preferences

The third section is divided into six questions, ranging from multiple-choice and open-ended to dichotomous questions. It deals with students' thoughts on how the flipped classroom helped them improve their learning, the aspects they liked about the flipped classroom experience, and the technological devices they used during their learning.

Section Four: Students' Personality Awareness

The questionnaire's fourth part also includes five items with different types of questions dedicated to investigating students' personality awareness and how their personality type may interfere with their preferences and ways of learning. Additionally, it deals with students' engagement and overall enjoyment of this learning method with reference to their personality type.

Section Five: Suggestions

The last section of the questionnaire includes only one item and serves to provide students with space to add further information or suggestions concerning the flipped classroom experience or any other general comments about the course.

4.5.3.1. Piloting the Questionnaire

Piloting the questionnaire is a crucial step in the research process as it allows researchers to test the reliability, validity, and clarity of their survey instrument before full-scale implementation. By administering the questionnaire to a small sample of participants, researchers can identify any ambiguities, errors, or biases in the questions, as well as assess the feasibility of the data collection process (Johnson & Onwuegbuzie, 2004). Piloting helps ensure that the questions effectively measure the intended constructs and are easily understood by respondents, thereby enhancing the overall quality and accuracy of the data collected. Moreover, piloting provides an opportunity for

researchers to refine their survey instrument based on feedback from participants, resulting in a more robust and reliable tool for data collection in the main study.

Scientific research must adhere to scientific methods. To ensure the questionnaire's validity and clarity, a group of students from the same population were given a trial run before it was distributed. The researcher received valuable feedback from the trial and used it to improve the questionnaire, addressing issues such as clarity, redundancy, and length.

4.5.4. Teachers' Semi-Structured Interview

Griffiee (2012) highlights that one crucial and prominent technique for gathering qualitative data is conducting an interview, which involves eliciting information from one individual to another. Teachers are recognized as a significant source of information, in addition to students. Therefore, the researcher chose to conduct teachers' interviews to gather their perceptions and opinions on using the flipped classroom as an instructional model. Teachers participating in this interview were carefully selected as teachers who have used the flipped classroom in teaching before and are well familiar with its principles and application. Using pre-determined questions, the researcher conducted semi-structured interviews with five different teachers from different Algerian universities in an attempt to answer the research questions of this study.

Semi-structured interviews are a qualitative research tool that employs open-ended questions, where the participants' responses are often unpredictable and not limited to pre-determined answers (Fraenkle et al., 2012). Along with the pre-determined objectives, these interviews may explore related topics and reveal essential information.

4.5.4.1. Description of Teachers' Interview

The researcher conducted a semi-structured interview with a total of five (5) EFL teachers using a pre-designed interview structure. The confidentiality of participants' personal information,

such as their names, was maintained throughout the study. Moreover, all transcribed and recorded data were also treated as confidential and used solely for research purposes. The interviewees were five EFL teachers from the English departments of Relizane, Annaba, Mostaganem, Guelma, and Setif Universities. Considering the difficulty of traveling to all the mentioned universities, some (3) interviews were conducted as phone calls, while the others (2) were conducted face-to-face. Each interview session took between 20-30 minutes taking into consideration teachers' comfort and ease in answering the questions according to their own pace. Prior to commencing the interview, the teachers were briefed on the research objectives and aims.

The semi-structured teachers' interview consisted of two parts and nineteen (19) questions (see Appendix 3). The first part was devoted to collecting general background information on the teachers, such as their degrees, years of teaching English at university, fields of study, periods of using the flipped classroom, and modules taught with the flipped model. The second part of the interview was dedicated to exploring teachers' attitudes toward teaching via the flipped classroom model. They were asked to answer questions about the differences they noticed between teaching via the flipped classroom and conventional teaching in all terms. Also, to state the benefits of the flipped classroom, the lessons, activities, and materials they have used. Furthermore, the interview questions were more focused on how the flipped classroom deals with different types of learners and their personalities and if it can increase learners' engagement. In the end, the teachers provide their personal opinions and whether they recommend using the flipped classroom.

4.5.4.2. Piloting the Interview

Piloting teacher interviews serves as a critical preparatory phase in the research process, enabling researchers to refine interview protocols and ensure the effectiveness of data collection methods (Creswell & Poth, 2017). Through pilot testing, researchers can evaluate the clarity of

interview questions, probe sequences, and the overall flow of the interview process (Guest, Bunce, & Johnson, 2006). Through iterative refinement based on pilot feedback, researchers can enhance the quality and rigor of teacher interviews, ultimately contributing to the validity and reliability of the research findings.

The pilot test was conducted with two EFL teachers from the English department. Based on the feedback received from the teachers, the pilot version of the semi-structured interview was deemed to be free of any deficiencies.

4.6. Research Procedure

The steps involved in conducting true-experimental research begin with the establishment of baseline data, followed by the implementation of the intervention, and conclude with the measurement of the findings (Forbes, 2015). Hence, this research is composed of pre-test, experiment, and post-test phases.

4.6.1. Pre-test Phase

Cohen et al. (2007) argue that conducting a pre-test allows for the evaluation of the homogeneity of participants before the treatment is administered. Accordingly, the phase before the intervention involved preparing and organizing the research experiment. The researcher started by making a verbal request to obtain official consent from the Head of the English Department to conduct the experiment (see Appendix 4). Then, the MBTI personality test was employed in both control and experimental groups to determine their personality types as introverts and extroverts. After that, the Engagement Inventory (USEI) was also administered to both the control and experimental groups to measure their levels of engagement before the experiment.

4.6.2. Experimental (Treatment) Phase

The duration of the treatment phase was 12 weeks, with each session lasting for one hour and a half and having one session per week. The treatment was specifically developed by the researcher who was also the teacher giving the lessons. At the start of the intervention, the researcher provided an explanation of the purpose and intentions of the study for the students. The study was conducted between October 2021 and January 2022 with the experimental group, which contains two subgroups organized by the English department's administration. The researcher applied the treatment in the oral expression session. The lesson plans and materials were designed according to the flipped classroom principles and rules, following the holistic type of flipped classroom model with the goal of increasing students' engagement. The content and objectives of the treatment sessions were designed to assist students in obtaining interest and motivation to engage on different levels (behavioral, emotional, and cognitive) academically taking into consideration their personality differences, that being an introverted or an extroverted student.

During their conventional oral expression classes, the control group received regular and routine instructions that followed traditional teaching methods. These methods involved assigning the control group tasks solely in class and having the lessons explained during their regular classroom sessions.

4.6.2.1. Lesson plan

The content of lessons delivered for the experimental group follows the guidelines of the flipped classroom model. Particularly, the holistic type of flipped classroom, which focuses on integrating the use of technological devices, platforms, and social media to facilitate learning. The lesson plans follow the oral expression syllabus for third-year EFL students taking into account providing content that stimulates students' engagement, especially introverted students. The flipped

lessons' in-class activities duration followed Bergmann and Sams's (2012) recommendations for conducting a flipped lesson.

Lesson One: Language Functions

This lesson focuses on language functions, where students learn to use functions, such as giving advice, making suggestions, and expressing opinions in real-life situations. The class starts with reviewing the pre-class tasks and answering questions then students describe their favorite childhood memories to each other. In the pair work activity, students practice using language functions in a mock conversation. They then participate in a group discussion using the language functions they have learned, followed by a role-play activity to solve a problem. The teacher gives feedback on students' use of language functions in the role-play activity. By the end of the lesson, students should be able to use a variety of language functions effectively in different situations.

Lesson Two: Developing Communication Strategies (Describing and Narrating Complex Events/Experiences)

The second lesson focuses on developing communication strategies. Students learn to describe and narrate complex events and experiences using appropriate vocabulary and grammar. The class starts with a Story Starters game where students use communication strategies to continue a story from where their classmates left off. Then review the in-class work. In the pair work activity, students practice describing and narrating a complex event or experience. They then participate in a group discussion on a complex topic, using appropriate vocabulary and communication strategies, followed by a role-play activity where they must describe and narrate a complex event or experience to their partner. The teacher provides feedback on students' use of communication strategies in the role-play activity.

Lesson Three: Developing Conversation Skills through Pronunciation (Listening, Reading, and Speaking)

Lesson three focuses on developing conversation skills through pronunciation. Students learn to improve their pronunciation skills in listening, reading, and speaking. The class starts with a Tongue Twisters game where students practice their pronunciation skills by saying complex phrases quickly and accurately. In the pair work activity, students practice their pronunciation skills by reading a dialogue out loud. They then participate in a group discussion on a topic related to pronunciation, using their newly acquired skills, followed by a role-play activity where they must use their pronunciation skills to convey a message to their partner. The teacher provides feedback on students' pronunciation skills in the role-play activity.

Lesson Four: Discourse Strategies (Formal vs. Informal Language)

This lesson focuses on discourse strategies, specifically formal vs. informal language. Students learn to differentiate between formal and informal language in various contexts and apply appropriate discourse strategies in different situations. The class starts with a Formal vs. Informal game where students decide if a sentence is formal or informal. In the group activity, students are divided into pairs and assigned a topic, such as a job interview or an email to a friend, where one student speaks in formal language and the other in informal language, then they switch roles. The individual activity has students write a short paragraph in either formal or informal language based on a given context.

Lesson Five: How to Prepare and Give an Effective Presentation

Lesson five focuses on preparing and delivering effective presentations as well as preparing PowerPoint presentations. Students learn the key elements of a successful presentation, how to structure and organize a presentation, and practice delivering a presentation with confidence. They

learn the Do's and Don'ts of PowerPoint presentations and how to make them. Pre-class tasks include watching videos on effective presentations and PowerPoints, reading an article on presentation tips, and creating an outline for a 5-minute presentation. The class discusses the structure and key elements of a successful presentation and then divides students into groups to prepare a 5-minute presentation on a given topic, receiving feedback and suggestions from both the teacher and peers.

Lesson Six: Idiomatic Expressions

In this lesson, students deal with idiomatic expressions. Students learn the meaning of common idiomatic expressions, use them in conversation and writing, and develop an awareness of cultural influences on language. Pre-class tasks include watching videos on idiomatic expressions, reading a passage containing idiomatic expressions and identifying the meaning of each one, and creating a list of idiomatic expressions commonly used. The class reviews and discusses the idiomatic expressions learned in the pre-class tasks, followed by a group activity where they create a skit incorporating idiomatic expressions and let their peers guess the meaning. The teacher provides feedback on the use of idiomatic expressions in the skit.

Lesson Seven: Job Interview

the topic of focus in this lesson is job interviews. The lesson aims to equip students with the knowledge and skills needed to effectively answer common interview questions, learn useful vocabulary and phrases for job interviews, and practice their speaking and listening skills in a simulated job interview. The pre-class tasks involve watching a video on common interview questions and completing a worksheet on job interview vocabulary and phrases. During the in-class session, the teacher begins with a warm-up discussion on the essential qualities of a job interviewee. Then, students review the vocabulary and phrases from the pre-class tasks. Most of the lesson is

spent on a simulated job interview where each student takes turns being the interviewer and interviewee. Finally, students conduct a group discussion on how to improve interview skills and techniques. This lesson is designed to help students become more confident and prepared for job interviews.

These lesson plans are based on the flipped classroom model, where students complete pre-class tasks to prepare for in-class activities that reinforce and build upon the concepts learned. The in-class tasks are designed to encourage active participation and engage students in speaking, listening, reading, and writing activities. The warm-up tasks are meant to activate prior knowledge and generate interest in the topic. Using various tasks and activities, these lesson plans aim to provide a well-rounded and interactive approach to teaching oral expression in an EFL setting. The following table summarizes all the lessons with the activities and durations.

Table 4.

Lesson Plans

Lesson Topic	Objectives	Pre-class Activities	In-class Activities
Language Functions	Develop language functions for describing, narrating, and persuading	Watch video lectures on language functions, take notes, and complete practice exercises	Warm-up: Have students pair up and describe their favorite childhood memory to each other (5 mins). Review of pre-class tasks and any questions (5 mins). Pair/group activities to practice language functions (40 mins). Wrap-up and feedback (10 mins).
Communication Strategies	Develop communication strategies for describing and narrating complex events/experiences	Watch video lectures on communication strategies, take notes, and complete practice exercises	Warm-up: Have students play a game of "Story starters" where students use communication strategies to continue a story from where their classmates left off (5 mins). Review of pre-class tasks and any questions (5 mins). Pair/group activities to practice communication strategies (40 mins). Wrap-up and feedback (10 mins).

Conversation Skills	Develop conversation skills through pronunciation, listening, reading, and speaking	Watch video lectures on conversation skills, take notes, and complete practice exercises	Warm-up: Have students practice a tongue twister and then discuss the importance of pronunciation in effective communication (5 mins). Review of pre-class tasks and any questions (5 mins). Pair/group activities to practice conversation skills (40 mins). Wrap-up and feedback (10 mins).
Discourse Strategies - Formal vs. Informal Language	Develop skills for using formal and informal language appropriately in different contexts	Watch a video lecture and read an article on formal and informal language, take notes, and complete practice exercises	Warm-up: Have students match examples of language use to either formal or informal categories (5 mins). Review of pre-class tasks and any questions (5 mins). Pair/group activities to practice using formal and informal language (40 mins). Wrap-up and feedback (10 mins).
How to Prepare and Give an Effective Presentation	Develop skills for preparing and delivering effective presentations and PowerPoints	Read an article and watch video lectures on presentation skills, take notes, and complete practice exercises	Warm-up: Have students brainstorm qualities of effective presentations and share with the class (5 mins). Review of pre-class tasks and any questions (5 mins). Pair/group activities to practice presentation skills (40 mins). Wrap-up and feedback (10 mins).
Idiomatic Expressions	Develop understanding and use of common idiomatic expressions	Watch video lectures on idiomatic expressions, take notes, and complete practice exercises	Warm-up: Have students brainstorm examples of idiomatic expressions they know and share with the class (5 mins). Review of pre-class tasks and any questions (5 mins). Pair/group activities to practice using idiomatic expressions (40 mins). Wrap-up and feedback (10 mins).
Job Interview	Develop skills for preparing and performing well in a job interview	Watch video lectures on job interviews, take notes, and complete practice exercises	Warm-up: Have students discuss in pairs what they think are the most important qualities for a job interviewee to have (5 mins). Review of pre-class tasks and any questions (5 mins). Pair/group activities to practice job interview skills (40 mins). Wrap-up and feedback (10 mins).

4.6.3. Post-test Phase

Following the treatment, a post-test is given to both the experimental group and the control group to evaluate the efficacy of the treatment by comparing the progress made by the experimental

group to that of the control group. In the post-test phase, the same Engagement Inventory (USEI) was administered to both control and experimental groups. Additionally, the Students' Questionnaire was used to collect information about the treatment from the experimental group only. Finally, a Teachers' Interview was conducted with teachers who have used the flipped classroom as an instructional model to record their experiences and perceptions. The timeline of the research procedure is summarized in table 5 below.

Table 5.

Research Procedure Timeline

	Tool of research	Time
Pre-Test	MBTI personality test	October 2021
	Engagement inventory	October 2021
Experiment	Flipped classroom experiment	October 2021 – January 2022
Post-Test	Engagement inventory	January 2022
	Questionnaire	January 2022
	Interview	February - March 2022

4.7. Data Analysis Procedures

Creswell (2014) stated that the process of analyzing data requires the interpretation of textual and visual information in order to derive meaning from it. Displaying the data in a structured and logical manner involves arranging the information in a systematic way so that it is easy to understand and interpret. The procedure of analyzing data uses tools for both quantitative and qualitative data.

4.7.1. Analysis of Quantitative Tools

The quantitative data from several sources, such as the Students' Engagement Inventory used during the pre-test and post-test, and the Students' Questionnaire, were subjected to statistical analysis using the SPSS .26 version software. The data collected from these instruments were coded and then transferred to a computer for analysis.

At the beginning of the analysis, descriptive statistics were utilized to calculate frequencies, percentages, modes, medians, and standard deviations. The effectiveness of the experimental intervention was evaluated by comparing the pre-test and post-test scores using the means. To examine the differences between the control and experimental groups, the pre-test results were compared with the post-test results of each group to calculate the difference in means, that is, the difference in the engagement levels of students.

4.7.2. Analysis of Qualitative Tools

The MBTI test results were recorded and organized to separate introverted and extroverted participants accordingly. The teachers' interview answers were recorded, transcribed, and organized. The analysis used in this study was thematic interview analysis, which involves analyzing and organizing data by identifying emerging themes in teachers' answers. The primary stage of thematic analysis involves coding and categorizing the data based on emerging themes; then, an in-depth reading of the interview transcripts allowed for the classification of their content into various themes based on the researcher's interpretation.

4.8. Research Validity and Reliability

The concepts of reliability and validity are closely linked to how trustworthy the researcher appears to the audience with regard to their data collection methods, analysis, and results. Reliability pertains to the extent to which a research tool yields stable and consistent results when

findings are gathered and analyzed multiple times. In other words, a research instrument is deemed reliable when it demonstrates consistency, stability, and accuracy both internally and over an extended period of time.

Whereas validity indicates the degree to which a test accurately measures what it claims to measure (Bryman, 2016). Reliability and validity are frequently associated with quantitative studies, which strive for objectivity and clarity in their research. Internal validity is a critical component of this, ensuring that the research findings accurately depict the phenomena under investigation. This is achieved by carefully designing the methodology of the study. The study follows a true-experimental design using a pre-test and post-test for the experimental and control groups.

Content validity requires the research instrument effectively and thoroughly cover the domain or items it claims to measure (Cohen et al., 2011). Content validity can be established by administering a test that confirms the difference in scores of students before and after an intervention. Moreover, external validity indicates the extent to which research findings can be applied to a larger population, cases, settings, times, or situations, provided that a similar study is conducted by another person under similar circumstances (Cohen et al., 2011).

At the start of the academic year, students in the English department were automatically assigned to their regular classes using a computer system, ensuring randomization between the two groups comprised of standard classes. The pre-test results indicate that the groups did not possess any prior advantage in terms of background knowledge that might have contributed to high scores on the post-test.

As the research involved a control group and an experimental group and used a pre-test and post-test design, it is essential to prioritize the maintenance of internal validity. While receiving

treatment, students of the experimental group continued to follow their regular study schedule as part of their daily routine as well as the control group students. The researcher followed the same syllabus for both experimental and control groups. In order to eliminate the risk of instrument decay (Campbell, 1957), which could potentially skew the results, the pre-test and post-test were conducted in a completely identical environment, and steps were taken to mitigate the impact of testing. Initially, the researcher supervised each test administration and efforts were made to create a conducive environment to minimize test anxiety and maintain normal testing conditions. To ensure consistency, the same instructor (also the researcher) administered identical tests and evaluated the students' level of engagement using the same criteria in both instances.

To bolster the reliability of the study, the researcher employed triangulation, a technique that confirms the accuracy of results by cross-referencing information through various means. In this particular study, the researcher utilized both source and method triangulation to validate the findings, demonstrating the reliability of the research.

4.9. Ethical Considerations

In the realm of educational research, ethical considerations take on great importance as researchers interact with individuals. Thus, it is crucial to adhere to ethical principles throughout the research process. Initially, obtaining administrative clearance from the Head of the English Department at 8 Mai 1945 University of Guelma (see Appendix 4) was mandatory to conduct the experiment that took place during the students' standard oral expression sessions. Also, all participants gave their consent to participate in the study. In addition, confidentiality was guaranteed to the participants, and their identities and responses were protected and kept anonymous, exclusively for the purpose of research. Furthermore, the researcher only used the

recording of the teachers' interviews to produce precise transcripts and assist in improving the notes that were gathered during the research.

Conclusion

This chapter delineates the applied research design and methods employed in the development and implementation of a flipped course delivery. It encompasses a restatement of the research questions and hypotheses, outlining the research methodology involving data and variable identification, instrumentation, and data collection. Additionally, it provides a comprehensive description of the population's characteristics, accompanied by elucidation of the sampling techniques. The chapter details the instruments utilized in the pre-test and post-test phases, elucidating the mixed-methods approach incorporating both quantitative and qualitative methods for data collection from both students and teachers. Furthermore, it expounds on the instruments used, such as the MBTI personality test and an engagement inventory in the pre-test, and an engagement inventory, questionnaire, and interview in the post-test. The exclusive application of the flipped classroom model as an instructional method in the experimental group is clarified, accompanied by an exposition of the experiment's lesson plans, highlighting distinctions from conventional lesson plans.

The chapter outlines the data analysis procedure utilizing SPSS .26 for quantitative data analysis and a thematic interview analysis for qualitative data, subsequent to recording, transcription, and organization. Important attention is given to research validity and reliability to uphold the study's authenticity and quality. The chapter concludes by presenting ethical considerations such as obtaining administrative clearance for conducting research and students' consent to participate while ensuring confidentiality for both students and teachers.

CHAPTER 5:

DATA PRESENTATION AND ANALYSIS

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Introduction

The following chapter delves into a comprehensive analysis of various data obtained from the research tools of this study involving the personality test and the engagement inventory in addition to the students' questionnaire and teachers' interview. The study aimed to assess the impact of the Flipped Classroom Model on student engagement, considering both control and experimental groups. This chapter dissects the data obtained through a rigorous examination of these instruments, with a specific focus on gender and measurement invariance, personality types, and the intriguing subset of introverted learners. Additionally, the chapter scrutinizes the Post-test Phase, comparing it to the pre-test results, and investigates the reliability and validity of the USEI. Furthermore, the chapter encompasses an exploration of students' questionnaire which deals with perspectives, preferences, personality awareness, and their invaluable suggestions, as well as insights gathered through the teachers' interviews about their experience in teaching via using the flipped classroom model. With an in-depth understanding of these analyses, this chapter sets the stage for the conclusion of this chapter.

5.1. Analysis of the Pre-test Phase

During the pre-test phase analysis attention is directed towards preparing and setting up the experiment. This crucial stage involves conducting the analysis of the personality test and the engagement inventory. In this context, we will examine the results obtained in the pre-test phase, providing a detailed account of the preparatory steps and procedures involved in laying the groundwork for the study.

5.1.1. Analysis of the Personality Test

The analysis of the MBTI personality test comprises the analysis of the test conducted with both the control and experimental groups. This test was administered to find the participants'

personality types as extroverts or introverts, which is a crucial element in our study. Students answered the MBTI test questions online on the 16 Personalities website². This test consists of 60 items and takes about 10-15 minutes to complete. After all students from the control and experimental groups completed the test, the researcher collected their answers and organized them in SPSS .26 software. Each student was assigned a personality type indicating whether they were introverts or extroverts. The following table demonstrates the results.

Table 6.

Personality Types

Personality Type	Introverted Students	Extroverted Students	Total Students
Experimental Group	30 (55.56%)	24 (44.44%)	54
Control Group	31 (54.39%)	26 (45.61%)	57

The table presents data on the distribution of students based on their personality types, specifically classifying them as either Introverted or Extroverted, within both the Experimental Group and the Control Group. The Experimental Group comprises 54 students, while the Control Group consists of 57 students, indicating relatively balanced sample sizes. Notably, in both groups, Introverted students are slightly more prevalent than Extroverted students. In the Experimental Group, Introverted students make up 55.56% of the total, whereas in the Control Group, they constitute 54.39%. Conversely, Extroverted students are somewhat more common in the Control Group, accounting for 45.61% of the group, compared to 44.44% in the Experimental Group.

² <https://www.16personalities.com/free-personality-test>

5.1.2. Analysis of the Engagement Inventory

The objective of analyzing students' engagement is to compare their level of engagement pre- and post-implementation of the treatment, with the aim of noting any differences in the outcomes. In this aspect of the research, the USEI was utilized as a tool prior to adopting the flipped classroom as a teaching methodology. This tool of research was used with both control and experimental groups.

The USEI is divided into three engagement dimensions: behavioral engagement, emotional engagement, and cognitive engagement. They are highlighted as items in the analysis according to the following demonstration.

Behavioral Engagement:

Item 1: I pay attention in class

Item 2: I follow the university's rules

Item 3: I usually do my homework on time

Item 4: When I have doubts, I ask questions and participate in debates in the classroom

Item 5: I usually participate actively in group assignments

Emotional Engagement:

Item 6: I don't feel very accomplished at this university (reversed)

Item 7: I feel excited about having assignments

Item 8: I like being at university

Item 9: I am interested in doing assignments

Item 10: My classroom is an interesting place to be

Cognitive Engagement:

Item 11: When I read a book, I question myself to make sure I understand the subject I'm reading about.

Item 12: I talk to people outside university on matters that I learned in class

Item 13: If I do not understand the meaning of a word, I try to solve the problem, for example, by consulting a dictionary or asking someone else

Item 14: I try to integrate the acquired knowledge in solving new problems

Item 15: I try to integrate subjects from different disciplines into my general knowledge

5.1.2.1. Control Group

The pre-test results of the inventory regarding the control group are displayed in the following section.

5.1.2.1.1. General Statistics

According to Table 7, the analysis of students' academic attitudes and behaviors yields a detailed picture of their engagement in various aspects of their education. On average, students tend to pay close attention in class, with a mean score of 4.11. This suggests a positive disposition towards classroom learning. The relatively small standard deviation of 0.737 indicates a consistent pattern in class engagement.

Similarly, students generally follow university rules, as indicated by a mean score of 4.04. However, there is some variability in compliance levels, reflected in the moderately narrow distribution with a standard deviation of 0.868.

Completing homework on time is another area where students exhibit commitment, with a mean score of 4.02. The distribution is moderately narrow, with a standard deviation of 0.954, suggesting that many students consistently meet assignment deadlines.

In contrast, when students have doubts, they tend to ask questions and participate in debates to a moderate extent, with a mean score of 3.24. The wider distribution, indicated by a standard deviation of 0.923, highlights varying levels of engagement in this aspect.

Students generally display a moderate level of interest in doing assignments (mean = 3.26), finding the classroom interesting (mean = 3.33), and integrating acquired knowledge into problem-solving (mean = 3.50). However, the associated standard deviations (1.163, 1.156, and 0.837, respectively) indicate some variability in these behaviors among students.

In the three-dimensional analysis, the overall students' mean engagement level is 3.46, indicating a moderate level of engagement across all dimensions. Behavioral Engagement has the highest mean score of 3.78, suggesting that students are actively engaged in behaviors such as paying attention, following rules, completing homework, participating in group assignments, and asking questions in class. Emotional Engagement has a mean score of 3.08, indicating a slightly lower level of emotional engagement. Students do not feel very accomplished at the university, but they have some excitement about having assignments. However, they express moderate levels of enjoying being at the university, being interested in doing assignments, and finding the classroom interesting.

Cognitive Engagement has a higher mean score of 3.51, indicating that students are more cognitively engaged compared to Emotional Engagement. They actively question themselves while reading, try to solve problems when encountering unfamiliar words, and integrate acquired knowledge in their general knowledge. It is important to note that some items have reversed scoring (indicated by the "R" symbol), so lower scores for those items indicate higher levels of agreement or engagement.

Table 7.*Pre-test General Statistics CG*

	N	Mean	Median	Mode	Std. Dev.	Range	Min.	Max.
Item 1	46	4,11	4,00	4	,737	4	1	5
Item 2	46	4,04	4,00	4	,868	3	2	5
Item 3	46	4,02	4,00	4	,954	4	1	5
Item 4	46	3,24	3,00	3	,923	3	2	5
Item 5	46	3,50	4,00	4	1,049	4	1	5
Item 6 ^R	46	2,85	3,00	3	,868	4	1	5
Item 7	46	2,98	3,00	3	1,105	4	1	5
Item 8	46	3,02	3,00	3	1,125	4	1	5
Item 9	46	3,26	3,00	3	1,163	4	1	5
Item 10	46	3,33	3,00	3	1,156	4	1	5
Item 11	46	4,20	5,00	5	1,108	4	1	5
Item 12	46	2,33	2,00	2	1,076	4	1	5
Item 13	46	4,11	4,00	5	1,016	4	1	5
Item 14	46	3,50	4,00	4	,837	4	1	5
Item 15	46	3,41	3,00	3	,858	4	1	5

Note. R=Reversed**5.1.2.1.2. Gender and Measurement Invariance**

The provided table 8 offers valuable insights into various aspects of student behavior, complete with mean scores and standard deviations, alongside the outcomes of independent samples t-tests comparing these aspects between genders. For instance, when it comes to paying attention in class, females exhibited a notably higher mean score than males (4.24 vs. 3.77, $t = -2.027$, $p = 0.049$), indicating a propensity for greater attentiveness among female students.

Similarly, in matters concerning adherence to university rules, females displayed a significantly higher mean score compared to their male counterparts (4.27 vs. 3.46, $t = -3.118$, $p = 0.003$), suggesting a stronger commitment to rule compliance within the female group. Timely completion of homework also showed gender-related disparities, with females once again

outsourcing males (4.21 vs. 3.54, $t = -2.251$, $p = 0.029$). Conversely, when considering other aspects like participation in classroom debates, active involvement in group assignments, feelings of accomplishment at the university, excitement about assignments, interest in doing assignments, finding the classroom interesting, and self-questioning while reading, no significant differences emerged between genders (all $p > 0.05$).

Notably, there was a marginally significant gender difference in enjoying being at the university (3.21 for females vs. 2.54 for males, $t = -1.879$, $p = 0.067$), indicating a slight preference for university life among female students. Furthermore, areas such as talking to people outside the university on learned topics, consulting dictionaries when encountering unfamiliar words, integrating acquired knowledge, and integrating subjects from different disciplines did not reveal any significant gender-based distinctions (all $p > 0.05$).

Table 8.*Pre-test Gender and Measurement Invariance CG*

	Gender	Mean	N	Std. Dev.
Item 1	Male	3,77	13	1,013
	Female	4,24	33	,561
Item 2	Male	3,46	13	,967
	Female	4,27	33	,719
Item 3	Male	3,54	13	1,391
	Female	4,21	33	,650
Item 4	Male	3,23	13	,927
	Female	3,24	33	,936
Item 5	Male	3,38	13	1,121
	Female	3,55	33	1,034
Item 6 ^R	Male	3,00	13	,707
	Female	2,79	33	,927
Item 7	Male	2,69	13	1,251
	Female	3,09	33	1,042
Item 8	Male	2,54	13	1,127
	Female	3,21	33	1,083
Item 9	Male	3,00	13	1,291
	Female	3,36	33	1,113
Item 10	Male	2,92	13	1,256
	Female	3,48	33	1,093
Item 11	Male	4,23	13	1,301
	Female	4,18	33	1,044
Item 12	Male	2,38	13	1,261
	Female	2,30	33	1,015
Item 13	Male	3,92	13	1,320
	Female	4,18	33	,882
Item 14	Male	3,69	13	1,109
	Female	3,42	33	,708
Item 15	Male	3,69	13	,751
	Female	3,30	33	,883

5.1.2.1.3. Personality Type and Measurement Invariance

According to Table 9 and by analyzing the t-test results, Introverts exhibited a significantly higher mean score in paying attention in class (4.19 vs. 3.93, $t = 2.027$, $p = 0.049$) and a marginally significant lower score in enjoying being at university (2.94 vs. 3.21, $t = -1.879$, $p = 0.067$). Conversely, there were no significant differences between the two groups in following university rules, completing homework on time, participating in classroom debates, actively engaging in group assignments, feeling accomplished at the university, excitement about assignments, interest in doing assignments, finding the classroom interesting, self-questioning while reading, integrating acquired knowledge in problem-solving, and integrating subjects from different disciplines into general knowledge (all $p > 0.05$).

However, two notable distinctions emerged: Introverts were more inclined to discuss class topics outside the university (2.09 vs. 2.86, $t = -3.095$, $p = 0.004$), while Extroverts were more likely to seek help for word meanings (3.94 vs. 4.50, $t = -2.530$, $p = 0.015$).

Table 9.*Pre-test Personality Type and Measurement Invariance CG*

	Personality	Mean	N	Std. Dev.
Item 1	Introvert	4,19	32	,535
	Extrovert	3,93	14	1,072
Item 2	Introvert	4,13	32	,833
	Extrovert	3,86	14	,949
Item 3	Introvert	4,13	32	,907
	Extrovert	3,79	14	1,051
Item 4	Introvert	3,19	32	,896
	Extrovert	3,36	14	1,008
Item 5	Introvert	3,47	32	1,135
	Extrovert	3,57	14	,852
Item 6 ^R	Introvert	2,81	32	,998
	Extrovert	2,93	14	,475
Item 7	Introvert	3,03	32	1,031
	Extrovert	2,86	14	1,292
Item 8	Introvert	2,94	32	1,243
	Extrovert	3,21	14	,802
Item 9	Introvert	3,34	32	1,096
	Extrovert	3,07	14	1,328
Item 10	Introvert	3,22	32	1,099
	Extrovert	3,57	14	1,284
Item 11	Introvert	4,19	32	1,061
	Extrovert	4,21	14	1,251
Item 12	Introvert	2,09	32	1,027
	Extrovert	2,86	14	1,027
Item 13	Introvert	3,94	32	1,105
	Extrovert	4,50	14	,650
Item 14	Introvert	3,44	32	,801
	Extrovert	3,64	14	,929
Item 15	Introvert	3,31	32	,859
	Extrovert	3,64	14	,842

5.1.2.1.4. Introverts as a Focus Group

The analysis of survey data, encompassing responses from a consistent sample size of 32 individuals for each item, reveals valuable statistical insights into various facets of university life.

Notably from table 10, respondents demonstrated a high level of attention in class (Mean = 4.19), strong adherence to university rules (Mean = 4.13), and timely completion of homework (Mean = 4.13). However, there was some variability in responses, with standard deviations ranging from 0.535 to 0.907, indicating differing degrees of agreement among participants. Additionally, respondents reported moderately positive attitudes towards active participation in group assignments (Mean = 3.47) and moderate interest in doing assignments (Mean = 3.34). On the other hand, feelings of accomplishment at the university (Mean = 2.81) and enjoying being at the university (Mean = 2.94) received lower mean scores, suggesting fewer positive perceptions.

The overall mean score across all dimensions of engagement is 3.428, indicating a moderate level of engagement on average among the respondents. In terms of behavioral engagement (Mean = 3.822), they exhibit a relatively high level, actively participating in classroom activities such as paying attention, following university rules, and completing assignments on time. However, emotional engagement (Mean = 3.068) registers at a moderate level, with mixed sentiments about university life. While respondents express excitement about assignments, feelings of accomplishment and a strong enjoyment for being at university are relatively lower. Cognitive engagement (Mean = 3.394) also falls within the moderate range, highlighting their active approach to academic challenges, including self-questioning during reading and problem-solving. Nevertheless, there is room for improvement in terms of discussing academic topics outside the university and integrating knowledge across disciplines.

The overall mean score across all dimensions is 3.428, which indicates a moderate level of engagement on average among the respondents. In terms of the behavioral engagement dimension, the mean score is 3.822, which suggests a relatively high level of behavioral engagement among the respondents. This implies that they pay attention in class, follow the university's rules, do their

homework on time, actively participate in group assignments, and ask questions when they have doubts. However, the mean score for the emotional engagement dimension is 3.068, indicating a moderate level of emotional engagement among the respondents. While they do not feel very accomplished at the university, they still express some excitement about having assignments.

However, their enjoyment of being at the university and interest in doing assignments, as well as their perception of the classroom as an interesting place, are relatively lower. Cognitive engagement mean score is 3.394, suggesting a moderate level of cognitive engagement among the respondents. They demonstrate a high level of self-questioning while reading, try to solve problems when they do not understand a word, and integrate acquired knowledge in solving new problems. However, their inclination to talk to people outside the university about what they learned, and integrating subjects from different disciplines into their general knowledge are relatively lower.

Table 10.

Pre-test Introverts as a Focus Group CG

	N	Mean	Median	Mode	Std. Dev.	Range	Min.	Max.
Item 1	32	4,19	4,00	4	,535	2	3	5
Item 2	32	4,13	4,00	4	,833	3	2	5
Item 3	32	4,13	4,00	4	,907	4	1	5
Item 4	32	3,19	3,00	3	,896	3	2	5
Item 5	32	3,47	4,00	4	1,135	4	1	5
Item 6 ^R	32	2,81	3,00	3	,998	4	1	5
Item 7	32	3,03	3,00	3	1,031	4	1	5
Item 8	32	2,94	3,00	3	1,243	4	1	5
Item 9	32	3,34	3,00	3	1,096	4	1	5
Item 10	32	3,22	3,00	3	1,099	4	1	5
Item 11	32	4,19	4,50	5	1,061	4	1	5
Item 12	32	2,09	2,00	2	1,027	4	1	5
Item 13	32	3,94	4,00	5	1,105	4	1	5
Item 14	32	3,44	3,00	3	,801	3	2	5
Item 15	32	3,31	3,00	3	,859	4	1	5

5.1.2.2. Experimental Group

The pre-test results of the inventory regarding the experimental group are displayed in the following section.

5.1.2.2.1. General Statistics

Table 11 demonstrates respondents' mean scores, medians, modes, and standard deviations for each item. Notably, for paying attention in class (Mean = 3.92), following university rules (Mean = 3.63), and completing homework on time (Mean = 4.06), the means suggest a generally positive attitude, while the modes of 4 and medians of 4 or 5 indicate agreement. Conversely, items related to feeling accomplished at the university (Mean = 2.53), excitement about assignments (Mean = 2.86), and enjoying being at the university (Mean = 3.08) received lower mean scores, suggesting fewer positive perceptions. Similarly, the mode of 3 and median of 3 for these items reflect relatively lower levels of agreement. Additionally, when analyzing the respondents' engagement in specific behaviors like questioning themselves while reading (Mean = 3.78) and trying to integrate acquired knowledge in problem-solving (Mean = 3.82), the means and modes suggest a moderately positive attitude.

The overall mean for all dimensions is 3.442 which suggests a moderate level of engagement among the respondents in various aspects of their university experience. While some dimensions may have received higher or lower mean scores individually, the overall mean reflects a balanced level of engagement across these different aspects. For instance, the respondents reported a relatively high level of behavioral engagement, with an average mean of 3.714. This suggests that they generally pay attention in class, follow university rules, do their homework on time, ask questions when they have doubts, and actively participate in group assignments. However, they reported a lower level of emotional engagement, with an average mean of 2.942.

This indicates that they do not feel very accomplished at the university, have limited excitement about assignments, and do not have a strong enjoyment for being at the university. Nevertheless, they do show some interest in doing assignments and consider the classroom to be somewhat interesting. Moreover, the respondents reported a relatively higher level of cognitive engagement, with an average mean of 3.67. This suggests that they actively question themselves when reading, engage in discussions with people outside the university about what they've learned, make an effort to understand the meaning of words and try to integrate their knowledge in solving new problems and across different disciplines.

Table 11.

Pre-test General Statistics EG

	N	Mean	Median	Mode	Std. Dev.	Range	Min.	Max.
Item 1	51	3,92	4,00	4	,771	3	2	5
Item 2	51	3,63	4,00	4	1,038	4	1	5
Item 3	51	4,06	4,00	5	,968	3	2	5
Item 4	51	3,33	3,00	3	1,260	4	1	5
Item 5	51	3,63	4,00	3	,958	3	2	5
Item 6 ^R	51	2,53	3,00	3	1,120	4	1	5
Item 7	51	2,86	3,00	3	1,184	4	1	5
Item 8	51	3,08	3,00	3	1,278	4	1	5
Item 9	51	3,08	3,00	3	1,111	4	1	5
Item 10	51	3,16	3,00	3	1,255	4	1	5
Item 11	51	3,78	4,00	5	1,346	4	1	5
Item 12	51	2,96	3,00	3	1,264	4	1	5
Item 13	51	4,22	5,00	5	1,026	3	2	5
Item 14	51	3,82	4,00	4	,974	3	2	5
Item 15	51	3,57	4,00	3	,985	4	1	5

5.1.2.2.2. Gender and Measurement Invariance

Amid the overall lack of significant gender differences in the responses, there are notable exceptions that warrant attention. In the item of following university rules, females (mean = 3.53)

appear to indicate a lower adherence compared to males (mean = 4.00), and this discrepancy is statistically significant. Likewise, when it comes to the item "I like being at university," females (mean = 2.98) express a lower level of fondness for their university experience compared to males (mean = 3.45), with a significant statistical difference. Additionally, in the context of integrating knowledge from different disciplines into their general understanding, females (mean = 3.50) exhibit a lower inclination compared to males (mean = 3.82), and this difference is statistically significant.

Table 12.*Pre-test Gender and Measurement Invariance EG*

	Gender	Mean	N	Std. Dev.
Item 1	Male	4,00	11	,775
	Female	3,90	40	,778
Item 2	Male	4,00	11	,632
	Female	3,53	40	1,109
Item 3	Male	3,91	11	,944
	Female	4,10	40	,982
Item 4	Male	3,45	11	1,293
	Female	3,30	40	1,265
Item 5	Male	3,82	11	,982
	Female	3,58	40	,958
Item 6 ^R	Male	2,00	11	1,265
	Female	2,68	40	1,047
Item 7	Male	2,91	11	,944
	Female	2,85	40	1,252
Item 8	Male	3,45	11	1,214
	Female	2,98	40	1,291
Item 9	Male	2,73	11	,905
	Female	3,17	40	1,152
Item 10	Male	3,55	11	1,036
	Female	3,05	40	1,300
Item 11	Male	3,64	11	1,567
	Female	3,82	40	1,299
Item 12	Male	3,09	11	,831
	Female	2,93	40	1,366
Item 13	Male	4,18	11	,982
	Female	4,23	40	1,050
Item 14	Male	4,27	11	,786
	Female	3,70	40	,992
Item 15	Male	3,82	11	,982
	Female	3,50	40	,987

5.1.2.2.3. Personality Type and Measurement Invariance

The analysis represented in Table 13 of responses from both Introverted and Extroverted individuals demonstrates that Introverts, on average, tend to report higher levels of attention in class (Mean = 4.00) compared to Extroverts (Mean = 3.81). However, Extroverts exhibit a slightly stronger tendency to follow university rules (Mean = 3.67) compared to Introverts (Mean = 3.57). Interestingly, Extroverts generally excel in doing their homework on time (Mean = 4.24), while Introverts are not far behind (Mean = 3.93). In terms of asking questions and participating in debates, Introverts (Mean = 3.07) express a lower inclination compared to Extroverts (Mean = 3.71). When it comes to active participation in group assignments, both groups are relatively similar, with Introverts scoring 3.53 and Extroverts scoring 3.76 on average. On the emotional engagement side, Introverts tend to feel less accomplished at the university (Mean = 2.57) than Extroverts (Mean = 2.48). Extroverts express more excitement about having assignments (Mean = 3.10) compared to Introverts (Mean = 2.70). Similarly, Extroverts (Mean = 3.33) tend to like being at the university more than Introverts (Mean = 2.90). In terms of interest in assignments, Extroverts (Mean = 3.38) again outscore Introverts (Mean = 2.87). Both groups consider their classrooms as moderately interesting places to be. In the cognitive engagement dimension, Introverts demonstrate a tendency to question themselves while reading (Mean = 3.70), slightly less than Extroverts (Mean = 3.90).

Similarly, Extroverts (Mean = 3.43) are more inclined to talk to people outside the university about what they learned in class compared to Introverts (Mean = 2.63). Both groups are proactive in solving language-related problems. When it comes to integrating acquired knowledge in problem-solving, Extroverts (Mean = 4.00) exhibit a slightly stronger tendency compared to Introverts (Mean = 3.70). Lastly, in integrating subjects from different disciplines into general

knowledge, Introverts tend to integrate subjects from different disciplines into their general knowledge more than extroverts (Mean 3,77 vs 3,29).

Table 13.

Pre-test Personality Type and Measurement Invariance EG

	Personality	Mean	N	Std. Dev.
Item 1	Introvert	4,00	30	,643
	Extrovert	3,81	21	,928
Item 2	Introvert	3,67	30	1,028
	Extrovert	3,57	21	1,076
Item 3	Introvert	3,93	30	1,048
	Extrovert	4,24	21	,831
Item 4	Introvert	3,07	30	1,311
	Extrovert	3,71	21	1,102
Item 5	Introvert	3,53	30	1,042
	Extrovert	3,76	21	,831
Item 6 ^R	Introvert	2,57	30	1,104
	Extrovert	2,48	21	1,167
Item 7	Introvert	2,70	30	1,264
	Extrovert	3,10	21	1,044
Item 8	Introvert	2,90	30	1,296
	Extrovert	3,33	21	1,238
Item 9	Introvert	2,87	30	1,224
	Extrovert	3,38	21	,865
Item 10	Introvert	3,07	30	1,413
	Extrovert	3,29	21	1,007
Item 11	Introvert	3,70	30	1,343
	Extrovert	3,90	21	1,375
Item 12	Introvert	2,63	30	1,426
	Extrovert	3,43	21	,811
Item 13	Introvert	4,30	30	,915
	Extrovert	4,10	21	1,179
Item 14	Introvert	3,70	30	,952
	Extrovert	4,00	21	1,000
Item 15	Introvert	3,77	30	,935
	Extrovert	3,29	21	1,007

5.1.2.2.4. Introverts as a Focus Group

According to Table 14, the participants generally exhibit a high level of attentiveness in class (mean = 4.00) and a tendency to follow university rules (mean = 3.67). Additionally, they often complete their homework on time (mean = 3.93) but show a lower inclination to actively engage in classroom discussions when they have doubts (mean = 3.07). There is also a range of sentiments related to university life, with respondents feeling somewhat less accomplished (mean = 2.57) and somewhat excited about assignments (mean = 2.70). The data reveals varying levels of enthusiasm for learning and integration of knowledge from different sources, with mean scores ranging from 2.63 to 4.30 for different items.

Considering the three dimensions of engagement, Behavioral Engagement's mean is 3.64, the respondents exhibit a relatively high level of behavioral engagement in their university life. This is reflected in their tendencies to pay attention in class, follow university rules, complete homework on time, and participate actively in group assignments. Emotional engagement among the respondents appears to be somewhat lower (Mean = 2.822) compared to behavioral engagement. They express mixed sentiments about their university experience, with scores indicating that they do not feel very accomplished and are moderately excited about assignments. In terms of cognitive engagement (Mean = 3.62), the respondents demonstrate a relatively strong inclination to engage with their academic work at a cognitive level. They question themselves when reading and actively try to solve problems related to their studies. They also show a willingness to integrate knowledge from various sources and disciplines into their general understanding. The overall mean across all engagement dimensions is 3.36. It suggests that, on average, the respondents are moderately engaged in their university experience.

Table 14.*Pre-test Introverts as a Focus Group*

	N	Mean	Range	Std. Dev.	Min.	Max.
Item 1	30	4,00	2	,643	3	5
Item 2	30	3,67	4	1,028	1	5
Item 3	30	3,93	3	1,048	2	5
Item 4	30	3,07	4	1,311	1	5
Item 5	30	3,53	3	1,042	2	5
Item 6 ^R	30	2,57	4	1,104	1	5
Item 7	30	2,70	4	1,264	1	5
Item 8	30	2,90	4	1,296	1	5
Item 9	30	2,87	4	1,224	1	5
Item 10	30	3,07	4	1,413	1	5
Item 11	30	3,70	4	1,343	1	5
Item 12	30	2,63	4	1,426	1	5
Item 13	30	4,30	3	,915	2	5
Item 14	30	3,70	3	,952	2	5
Item 15	30	3,77	3	,935	2	5

5.2. Analysis of the Post-test Phase

In the post-test phase of an experiment or research study, the focus shifts to the analysis of collected data to draw conclusions and insights. This critical stage allows researchers to evaluate the impact of experimental variables, assess the effectiveness of interventions, and make informed decisions based on the findings. In this context, we will explore the analysis conducted during the post-test phase, offering a comprehensive overview of the key observations and outcomes derived from the collected data.

5.2.1. Analysis of the Engagement Inventory

In the post-test phase of a research study, the analysis of the Engagement Inventory is a crucial component that provides insights into participant engagement levels and dimensions. This analysis aims to uncover patterns and trends within the collected data, offering valuable information

for decision-making and a deeper understanding of participant engagement within the study's context.

5.2.1.1. Control Group

The post-test results of the control group are presented as the following.

5.2.1.1.1. General statistics

Analyzing Table 15, we can make several observations about the data. Each variable has a sample size of 46. The mean represents the average value of the data. Across the variables, the mean ranges from 2.20 to 3.91. "I feel excited about having assignments" has the lowest mean of 2.20, while "When I read a book, I question myself to make sure I understand the subject I'm reading about" has the highest mean of 3.91. The median represents the middle value in the data when it is sorted in ascending order. The median ranges from 2.00 to 4.00. "I try to integrate subjects from different disciplines into my general knowledge" has the lowest median of 3.50, while "I pay attention in class", "I follow the university's rules", "I usually do my homework on time", and "If I do not understand the meaning of a word, I try to solve the problem, for example, by consulting a dictionary or asking someone else" have the highest median of 4.00.

Moreover, the mode represents the most frequently occurring value in the data. The mode is consistently 4 across all variables, except for "When I read a book, I question myself to make sure I understand the subject I'm reading about", where the mode is 5. This means that the value 4 appears most frequently in the data for the majority of variables.

The standard deviation measures the variability or spread of the data. It ranges from 0.818 to 1.323. "I pay attention in class" has the lowest standard deviation of 0.818, while "I like being at university" has the highest standard deviation of 1.323. Additionally, the range represents the difference between the maximum and minimum values in the data. The range is consistently 4 for

all variables, indicating that the data spans from the minimum value of 1 to the maximum value of 5. Overall, the data shows some variation in the mean, median, and standard deviation across the variables. However, the mode is consistently 4 for most variables, suggesting that 4 is the most common response. The range is the same for all variables, indicating that the spread of the data is consistent.

Considering the three engagement dimensions of the USEI, the overall mean and the mean for each of the three engagement dimensions based on the provided table are as the following. The overall mean score indicates a moderate level of engagement across the 15 items, with an average rating of 3.22. Among the three engagement dimensions, cognitive engagement has the highest mean score (3.55), indicating a relatively higher level of engagement in cognitive activities such as questioning, problem-solving, and integration of knowledge. Behavioral engagement follows with a mean score of 3.39, suggesting a relatively higher level of engagement in behaviors such as paying attention, following rules, completing homework, and active participation in group assignments. Emotional engagement has the lowest mean score (2.71), indicating a relatively lower level of emotional attachment or fulfillment in the university environment.

Table 15.*Post-test General Statistics CG*

	N	Mean	Median	Mode	Std. Dev.	Range	Min.	Max.
Item 1	46	3,67	4,00	4	0,818	3	2	5
Item 2	46	3,41	4,00	4	1,166	4	1	5
Item 3	46	3,48	4,00	4	1,243	4	1	5
Item 4	46	2,85	3,00	3	0,988	4	1	5
Item 5	46	3,54	4,00	4	1,026	4	1	5
Item 6 ^R	46	2,96	3,00	3	0,942	4	1	5
Item 7	46	2,20	2,00	2	1,128	4	1	5
Item 8	46	2,93	3,00	4	1,323	4	1	5
Item 9	46	2,59	3,00	3	1,127	4	1	5
Item 10	46	2,85	3,00	3	1,192	4	1	5
Item 11	46	3,91	4,00	5	1,279	4	1	5
Item 12	46	2,65	3,00	3	1,120	4	1	5
Item 13	46	3,85	4,00	4	1,115	4	1	5
Item 14	46	3,74	4,00	4	0,828	3	2	5
Item 15	46	3,59	3,50	3	0,832	3	2	5

5.2.1.1.2. Gender and Measurement Invariance

Based on the t-test results, a few variables with significant differences existed between males and females. Females tend to do their homework on time more frequently compared to males ($p < 0.05$). However, for the majority of variables, including paying attention in class, following university rules, active participation in assignments, feeling accomplished at the university, and others, there are no statistically significant differences between males and females ($p > 0.05$).

Table 16.*Post-test Gender and Measurement Invariance CG*

	Gender	N	Mean	Std. Dev.	Std. Error Mean
Item 1	Male	13	3,38	0,961	0,266
	Female	33	3,79	0,740	0,129
Item 2	Male	13	2,92	1,256	0,348
	Female	33	3,61	1,088	0,189
Item 3	Male	13	2,85	1,405	0,390
	Female	33	3,73	1,098	0,191
Item 4	Male	13	3,15	0,987	0,274
	Female	33	2,73	0,977	0,170
Item 5	Male	13	3,62	1,261	0,350
	Female	33	3,52	0,939	0,164
Item 6 ^R	Male	13	2,85	1,144	0,317
	Female	33	3,00	0,866	0,151
Item 7	Male	13	1,92	1,188	0,329
	Female	33	2,30	1,104	0,192
Item 8	Male	13	2,69	1,316	0,365
	Female	33	3,03	1,334	0,232
Item 9	Male	13	2,31	0,630	0,175
	Female	33	2,70	1,262	0,220
Item 10	Male	13	3,08	1,115	0,309
	Female	33	2,76	1,226	0,213
Item 11	Male	13	3,69	1,316	0,365
	Female	33	4,00	1,275	0,222
Item 12	Male	13	3,15	1,068	0,296
	Female	33	2,45	1,092	0,190
Item 13	Male	13	3,85	1,281	0,355
	Female	33	3,85	1,064	0,185
Item 14	Male	13	3,77	0,927	0,257
	Female	33	3,73	0,801	0,139
Item 15	Male	13	3,85	0,689	0,191
	Female	33	3,48	0,870	0,152

5.2.1.1.3. Personality Type and Measurement Invariance

As shown in Table 17 and by comparing the mean scores of introverts and extroverts across various personality traits and behaviors related to academic performance and engagement, the analysis shows that there are a few significant differences between introverts and extroverts in their

academic behaviors and attitudes. Extroverts tend to feel more excited about having assignments since the mean scores for introverts ($M = 1.97$) and extroverts ($M = 2.71$), and this difference is statistically significant ($p < 0.05$). Also, extroverts tend to question themselves more while reading; the mean scores for introverts ($M = 3.72$) and extroverts ($M = 4.36$), and this difference is statistically significant ($p < 0.05$). Additionally, extroverts are more likely to seek help when they do not understand a word; the mean scores for introverts ($M = 3.59$) and extroverts ($M = 4.43$), and this difference is statistically significant ($p < 0.05$).

However, there are no significant differences between the two groups in terms of attention in class, following university rules, doing homework on time, active participation in group assignments, feeling accomplished at the university, enjoying being at the university, interest in doing assignments, perceiving the classroom as interesting, integrating acquired knowledge, and integrating subjects from different disciplines ($p > 0.05$).

Table 17.*Post-test Personality Type and Measurement Invariance CG*

	Personality	N	Mean	Std. Dev.	Std. Error Mean
Item 1	Introvert	32	3,66	,937	,166
	Extrovert	14	3,71	,469	,125
Item 2	Introvert	32	3,56	1,216	,215
	Extrovert	14	3,07	,997	,267
Item 3	Introvert	32	3,53	1,295	,229
	Extrovert	14	3,36	1,151	,308
Item 4	Introvert	32	2,78	,941	,166
	Extrovert	14	3,00	1,109	,296
Item 5	Introvert	32	3,44	1,134	,200
	Extrovert	14	3,79	,699	,187
Item 6 ^R	Introvert	32	2,94	1,076	,190
	Extrovert	14	3,00	,555	,148
Item 7	Introvert	32	1,97	1,031	,182
	Extrovert	14	2,71	1,204	,322
Item 8	Introvert	32	3,00	1,391	,246
	Extrovert	14	2,79	1,188	,318
Item 9	Introvert	32	2,53	1,218	,215
	Extrovert	14	2,71	,914	,244
Item 10	Introvert	32	2,78	1,289	,228
	Extrovert	14	3,00	,961	,257
Item 11	Introvert	32	3,72	1,301	,230
	Extrovert	14	4,36	1,151	,308
Item 12	Introvert	32	2,50	1,164	,206
	Extrovert	14	3,00	,961	,257
Item 13	Introvert	32	3,59	1,160	,205
	Extrovert	14	4,43	,756	,202
Item 14	Introvert	32	3,81	,859	,152
	Extrovert	14	3,57	,756	,202
Item 15	Introvert	32	3,47	,879	,155
	Extrovert	14	3,86	,663	,177

5.2.1.1.4. Introverts as a Focus Group

According to Table 18, the overall mean score is 3.152, indicating a moderate level of engagement across all dimensions. To analyze each dimension, we start with behavioral Engagement (Mean: 3.394). The scores in this dimension suggest that students generally pay attention in class, follow university rules, and usually do their homework on time. The mean score indicates a moderate level of behavioral engagement. Moreover, Emotional Engagement's mean is 2.644. This score suggests that students have mixed feelings about their sense of accomplishment at the university, excitement about having assignments, and enjoying being at the university. The mean score indicates a relatively low level of emotional engagement.

For Cognitive Engagement (Mean: 3.418), the scores in this dimension suggest that students exhibit varying levels of interest in doing assignments, find the classroom interesting, question themselves while reading, talk to people outside the university about what they have learned, and try to solve problems when they do not understand the meaning of a word. The mean score indicates a moderate level of cognitive engagement.

Table 18.*Post-test Introverts as a Focus Group CG*

	N	Mean	Median	Mode	Std. Dev.	Range	Min.	Max.
Item 1	32	3,66	4,00	4	,937	3	2	5
Item 2	32	3,56	4,00	4	1,216	4	1	5
Item 3	32	3,53	4,00	4	1,295	4	1	5
Item 4	32	2,78	3,00	3	,941	4	1	5
Item 5	32	3,44	3,50	3 ^a	1,134	4	1	5
Item 6	32	2,94	3,00	3	1,076	4	1	5
Item 7	32	1,97	2,00	2	1,031	4	1	5
Item 8	32	3,00	3,00	3 ^a	1,391	4	1	5
Item 9	32	2,53	2,00	2	1,218	4	1	5
Item 10	32	2,78	3,00	3	1,289	4	1	5
Item 11	32	3,72	4,00	5	1,301	4	1	5
Item 12	32	2,50	2,50	3	1,164	4	1	5
Item 13	32	3,59	4,00	4	1,160	4	1	5
Item 14	32	3,81	4,00	4	,859	3	2	5
Item 15	32	3,47	3,00	3	,879	3	2	5

Note. a. Multiple modes exist. The smallest value is shown

5.2.1.2. Experimental Group

The following section is dedicated to present the post-test results of the experimental group.

5.2.1.2.1. General Statistics

Table 19 shows the overall mean scores for the statements range from 2.49 to 4.51, indicating moderate to high levels of agreement or engagement on average. The range of scores for each statement varies from 3 to 4, suggesting diversity in responses and levels of agreement or engagement. Some statements have higher mean scores, indicating a generally positive attitude or behavior, such as doing homework on time (mean: 4.27), feeling accomplished at the university (mean: 2.49^R), and actively participating in group assignments (mean: 3.61). It is important to note

that item number 6 ("I don't feel very accomplished at this university") is reversed, as indicated by the "R" symbol. Therefore, a lower score indicates a higher level of accomplishment.

On the other hand, statements like "I talk to people outside the university about what they learned in class" (mean: 2.78) have lower mean scores, suggesting lower levels of accomplishment or engagement.

The standard deviations for each statement indicate the level of variability in responses. Higher standard deviations imply greater diversity in opinions or behaviors among the respondents. Some statements with higher standard deviations include actively participating in group assignments (std. deviation: 1.115) and questioning oneself while reading (std. deviation: 1.298), indicating a wider range of responses and greater variability in these areas.

To analyze the three dimensions of engagement of the experimental group, we start with Behavioral Engagement; the mean score for behavioral engagement is 3.828. This suggests that, on average, respondents tend to pay attention in class, follow university rules, do their homework on time, ask questions and participate actively in class, and participate actively in group assignments. Moreover, the mean score for emotional engagement is 3.184. This indicates that, on average, respondents have mixed feelings about their level of accomplishment at the university. They feel some excitement about having assignments, but the average score is lower compared to the other factors.

The mean score for cognitive engagement is 3.752. This suggests that, on average, respondents demonstrate a good level of cognitive engagement. They question themselves when reading books, integrate acquired knowledge to solve problems, and integrate subjects from different disciplines into their general knowledge.

The overall mean score for all dimensions is 3.588 indicating a moderate level of engagement across all dimensions.

Table 19.

Post-test General Statistics EG

	N	Mean	Median	Mode	Std. Dev.	Range	Min.	Max.
Item 1	49	4,06	4,00	4	,719	3	2	5
Item 2	49	3,96	4,00	4	,815	3	2	5
Item 3	49	4,27	4,00	5	,785	3	2	5
Item 4	49	3,24	3,00	4	1,128	4	1	5
Item 5	49	3,61	4,00	4	1,115	4	1	5
Item 6 ^R	49	2,49	2,00	2 ^a	,893	4	1	5
Item 7	49	3,31	3,00	3	1,194	4	1	5
Item 8	49	3,22	3,00	3	1,177	4	1	5
Item 9	49	3,35	3,00	4	1,032	4	1	5
Item 10	49	3,55	4,00	4	1,100	4	1	5
Item 11	49	3,94	4,00	5	1,298	4	1	5
Item 12	49	2,78	3,00	2	1,229	4	1	5
Item 13	49	4,51	5,00	5	,820	3	2	5
Item 14	49	3,73	4,00	4	,861	3	2	5
Item 15	49	3,80	4,00	4	,841	3	2	5

Note. a=Multiple modes exist. The smallest value is shown. R=Reversed

5.2.1.2.2. Gender and Measurement Invariance

The statistics represented for each item in Table 20 reveal some gender-based differences in respondents' attitudes and behaviors. For example, females demonstrate significantly higher engagement in activities like reading comprehension and proactive problem-solving when encountering unfamiliar words, as indicated by the higher mean score of 4.13 compared to males' mean score of 3.27 in the item "When I read a book, I question myself to make sure I understand the subject I'm reading about."

Similarly, females tend to be more excited about having assignments, with a mean score of 3.42 compared to males' mean score of 2.91 in the item "I feel excited about having assignments." They also show a stronger preference for being at the university, as evidenced by a mean score of 3.29 compared to males' mean score of 3.00 in the item "I like being at university."

In contrast, males exhibit a higher level of active engagement in asking questions and participating in debates in the classroom, with a mean score of 3.73, whereas females have a mean score of 3.11 in the item "When I have doubts, I ask questions and participate in debates in the classroom."

While these gender-based variations exist, it is important to note that for many other survey items, including "I follow the university's rules," "I usually do my homework on time," and "I talk to people outside university on matters that I learned in class," there are either no significant differences or only marginal variations between males and females.

The t-test results for each item indicate that, for the majority of items, there are no statistically significant differences in mean scores between males and females, as all p-values are greater than 0.05. This suggests that gender does not appear to play a significant role in how respondents rate these aspects of their academic experiences, including paying attention in class, following university rules, completing homework on time, participating in group assignments, feelings of accomplishment at the university, excitement about having assignments, enjoying the university environment, interest in doing assignments, perceiving the classroom as interesting, talking to people outside the university about class matters, and integrating acquired knowledge in problem-solving. However, a noteworthy finding emerges in Item 13, where there is a significant gender difference ($p < 0.05$), indicating that males and females employ distinct problem-solving strategies when encountering unfamiliar words.

Table 20.*Post-test Gender and Measurement Invariance EG*

	Gender	Mean	N	Std. Dev.
Item 1	Male	3,82	11	,751
	Female	4,13	38	,704
Item 2	Male	3,64	11	,674
	Female	4,05	38	,837
Item 3	Male	4,09	11	1,044
	Female	4,32	38	,702
Item 4	Male	3,73	11	1,191
	Female	3,11	38	1,085
Item 5	Male	3,64	11	1,206
	Female	3,61	38	1,104
Item 6 ^R	Male	2,27	11	1,104
	Female	2,55	38	,828
Item 7	Male	2,91	11	1,221
	Female	3,42	38	1,177
Item 8	Male	3,00	11	1,183
	Female	3,29	38	1,183
Item 9	Male	3,45	11	,820
	Female	3,32	38	1,093
Item 10	Male	4,00	11	,894
	Female	3,42	38	1,130
Item 11	Male	3,27	11	1,737
	Female	4,13	38	1,095
Item 12	Male	2,64	11	1,120
	Female	2,82	38	1,270
Item 13	Male	3,64	11	1,120
	Female	4,76	38	,490
Item 14	Male	3,82	11	,982
	Female	3,71	38	,835
Item 15	Male	3,73	11	,905
	Female	3,82	38	,834

5.2.1.2.3. Personality Type and Measurement Invariance

On the one hand, Table 21 presents a comprehensive overview of the survey results, including mean scores and standard deviations, for each survey item categorized by personality type (introvert and extrovert). Notable patterns emerge from the data. For instance, in terms of "Participating actively in group assignments," extroverts display a significantly higher mean score of 4.10 compared to introverts' mean score of 3.28, indicating a greater proclivity for active participation among extroverts. Similarly, "Liking being at the university" reflects extroverts' higher mean score of 3.70 in contrast to introverts' mean score of 2.90, demonstrating a stronger affinity for the university environment among extroverted individuals. Conversely, in "Asking questions and participating in debates in the classroom," introverts score lower (mean = 3.00) compared to extroverts (mean = 3.60), with higher variability among introverts.

On the other hand, the results of independent sample t-tests reveal distinct patterns in the academic behaviors and preferences of introverted and extroverted students. In various aspects, no statistically significant differences were found between the two groups, including paying attention in class, following university rules, doing homework on time, and engaging in activities like questioning oneself while reading or integrating acquired knowledge into problem-solving (all $p > 0.05$). However, significant differences emerged in several areas. Extroverted students exhibited significantly higher levels of active participation in group assignments ($p < 0.05$) and were more likely to engage in discussions outside the university about class topics ($p < 0.05$) compared to their introverted counterparts. Additionally, extroverts expressed a stronger preference for being at the university ($p < 0.05$).

Table 21.*Post-test Personality Type and Measurement Invariance EG*

	Personality	Mean	N	Std. Dev.
Item 1	Introvert	4,03	29	,680
	Extrovert	4,10	20	,788
Item 2	Introvert	4,03	29	,731
	Extrovert	3,85	20	,933
Item 3	Introvert	4,21	29	,726
	Extrovert	4,35	20	,875
Item 4	Introvert	3,00	29	1,195
	Extrovert	3,60	20	,940
Item 5	Introvert	3,28	29	1,162
	Extrovert	4,10	20	,852
Item 6 ^R	Introvert	2,59	29	,907
	Extrovert	2,35	20	,875
Item 7	Introvert	3,14	29	1,093
	Extrovert	3,55	20	1,317
Item 8	Introvert	2,90	29	1,205
	Extrovert	3,70	20	,979
Item 9	Introvert	3,17	29	1,002
	Extrovert	3,60	20	1,046
Item 10	Introvert	3,52	29	1,122
	Extrovert	3,60	20	1,095
Item 11	Introvert	3,97	29	1,349
	Extrovert	3,90	20	1,252
Item 12	Introvert	2,55	29	1,298
	Extrovert	3,10	20	1,071
Item 13	Introvert	4,52	29	,829
	Extrovert	4,50	20	,827
Item 14	Introvert	3,83	29	,928
	Extrovert	3,60	20	,754
Item 15	Introvert	3,72	29	,882
	Extrovert	3,90	20	,788

5.2.1.2.4. Introverts as a Focus Group

According to Table 22, on average, students seem to have a positive attitude towards their academic responsibilities. For instance, they reported a moderately high mean score of 4.03 for paying attention in class, 4.03 for following university rules, and 4.21 for completing homework on time. However, there is some variability in these behaviors, as indicated by the standard deviations, with scores ranging from 3 to 5, implying that individual study habits and approaches may differ.

In contrast, students appear less inclined to actively participate in class discussions and group assignments, as evidenced by the lower mean scores of 3.00 and 3.28, respectively. The wider standard deviations in these areas, with scores ranging from 1 to 5, indicate a significant spread of responses, possibly influenced by factors like class size and teaching methods. Moreover, while students generally enjoy being at the university with a mean score of 2.90 and find their classrooms interesting with a mean score of 3.52, there is a notable range of responses, suggesting that personal experiences at the university may vary widely.

Furthermore, students' feelings of accomplishment at the university are more mixed, with a mean score of 2.59. This suggests that some students may not feel entirely fulfilled in their academic journey, though the standard deviation of 0.907 indicates a degree of consensus among respondents.

Interestingly, students seem to actively seek help to understand word meanings with a mean score of 4.52, and integrate their acquired knowledge into problem-solving with a mean score of 3.83. These behaviors are reflected in higher mean scores and lower standard deviations, suggesting a more uniform approach among students in these areas.

Moreover, considering the three engagement dimensions, the overall mean score for student engagement across the various dimensions is 3.497, suggesting a moderate level of engagement on average. In the dimension of Behavioral Engagement (Mean: 3,71), students tend to exhibit behaviors associated with academic commitment. They generally report paying attention in class, following university rules, and completing their homework on time. The mean score of 3.71 indicates a relatively high level of behavioral engagement. On the other hand, Emotional Engagement (Mean: 3,064) among students appears to be more mixed. They report varied feelings about their accomplishments at the university, excitement about assignments, and their overall enjoyment of being at the university. The mean score of 3.064 suggests a moderate level of emotional engagement, indicating room for improvement in this aspect.

In the dimension of Cognitive Engagement (Mean: 3,718), students exhibit diverse attitudes and behaviors. They display varying levels of interest in assignments, find the classroom interesting, question themselves while reading, engage in discussions with people outside the university, and actively seek solutions to understanding problems. The mean score of 3,718 suggests a relatively high level of cognitive engagement, reflecting a strong commitment to intellectual pursuits.

Table 22.*Post-test Introverts as a Focus Group EG*

	N	Mean	Median	Mode	Std. Dev.	Range	Min.	Max.
Item 1	29	4,03	4,00	4	,680	2	3	5
Item 2	29	4,03	4,00	4	,731	2	3	5
Item 3	29	4,21	4,00	4	,726	2	3	5
Item 4	29	3,00	3,00	3	1,195	4	1	5
Item 5	29	3,28	3,00	3	1,162	4	1	5
Item 6 ^R	29	2,59	3,00	3	,907	4	1	5
Item 7	29	3,14	3,00	3	1,093	4	1	5
Item 8	29	2,90	3,00	3	1,205	4	1	5
Item 9	29	3,17	3,00	4	1,002	4	1	5
Item 10	29	3,52	4,00	4	1,122	3	2	5
Item 11	29	3,97	5,00	5	1,349	4	1	5
Item 12	29	2,55	2,00	2	1,298	4	1	5
Item 13	29	4,52	5,00	5	,829	3	2	5
Item 14	29	3,83	4,00	4	,928	3	2	5
Item 15	29	3,72	4,00	4	,882	3	2	5

5.2.2. Comparison of Pre-test and Post-test Results

To measure the success of the intervention being the flipped classroom as an instructional method, we need to compare the pre-test and post-test results for both groups and assess the differences. The mean scores of the pre-test are compared with the mean scores of the post-test for both the control and experimental groups to measure the level of change in students' engagement.

5.2.2.1. Control Group

Table 23 and Figure 18 represent pre-test and post-test mean scores for the 15 different items of the engagement inventory as well as an overall score. The data represents the control group and the baseline scores or measures taken before any intervention and then after a specified period of time. Data was gathered to represent the natural state of student engagement without any specific changes introduced by the experimental intervention.

The control group's engagement levels exhibited nuanced changes across various dimensions. The overall pre-test mean is 3.46, while the overall post-test mean is 3.22. This suggests that, on average, participants' scores decreased from the pre-test to the post-test. Notably, Item 2, "I follow the university's rules," saw the most substantial decrease with a drop of 0.63, indicating a significant reduction in engagement in adhering to university rules. A similar trend was observed in Item 9, "I am interested in doing assignments," with a mean score decrease of 0.67, suggesting a substantial decline in interest in assignments. In contrast, Item 5, "I usually participate actively in group assignments," displayed a slight increase, with the mean score rising by 0.04, indicating a small improvement in engagement in group assignments.

Items 4 and 11 showed more considerable declines, with mean scores decreasing by 0.39 and 0.29, respectively, indicating significant decreases in engagement related to asking questions and participating in debates in the classroom (Item 4) and questioning oneself during reading (Item 11). Items 7, 8, and 10, which measure students' feelings of excitement about assignments, their enjoyment for being at the university, and their perception of the classroom's interest, all displayed decreases in mean scores by 0.78, 0.09, and 0.48, respectively, indicating reduced engagement in these aspects.

Table 23.*Control Group Pre/Post-test Comparison*

Item	N	Pre-test Mean	Post-test Mean
Item 1	46	4.11	3.67
Item 2	46	4.04	3.41
Item 3	46	4.02	3.48
Item 4	46	3.24	2.85
Item 5	46	3.50	3.54
Item 6 ^R	46	2.85	2.96
Item 7	46	2.98	2.20
Item 8	46	3.02	2.93
Item 9	46	3.26	2.59
Item 10	46	3.33	2.85
Item 11	46	4.20	3.91
Item 12	46	2.33	2.65
Item 13	46	4.11	3.85
Item 14	46	3.50	3.74
Item 15	46	3.41	3.59
Overall	46	3.46	3.22

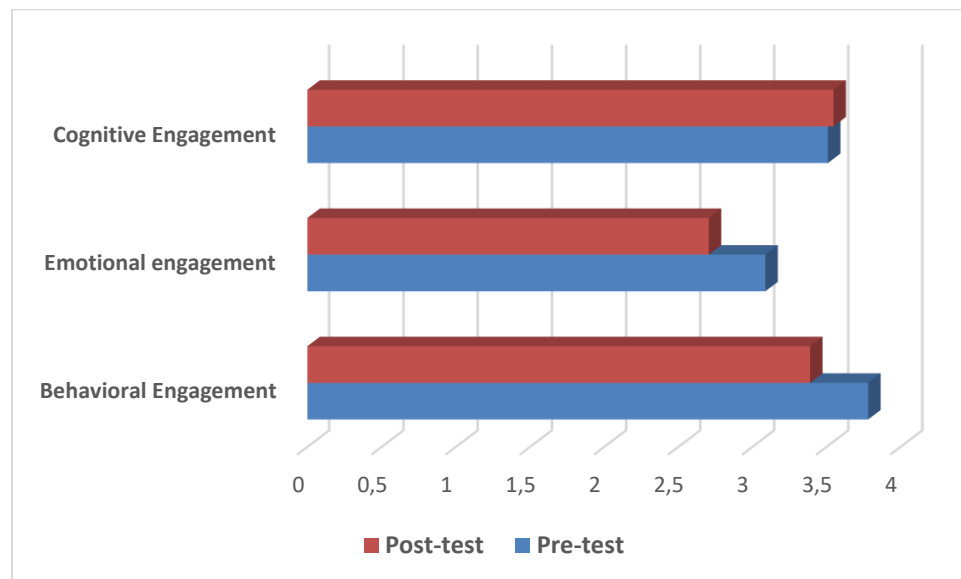
Figure 18.*Control Group Pre/Post-test Comparison*

The data in Figure 19 illustrates changes in student engagement across the three Engagement dimensions. In terms of Behavioral Engagement, the Pre-test Mean was 3,782, which notably decreased to 3,390 in the Post-test. This significant drop indicates a reduction in students' observable engagement behaviors, reflecting substantial changes in this aspect. Emotional Engagement exhibited a similar trend, with a Pre-test Mean of 3,088 decreasing substantially to

2,706 in the Post-test. This substantial decrease signifies a considerable decline in students' emotional engagement, suggesting less positive emotional experiences related to their educational activities. In contrast, Cognitive Engagement displayed a minor increase, with a Pre-test Mean of 3,510 and a Post-test Mean of 3,548. This indicates that, on average, cognitive engagement experienced only a modest change, implying that students' intellectual involvement remained relatively stable.

Figure 19.

Control Group Pre/Post-test Dimensional Comparison



5.2.2.1.1. Introverts as a Focus Group

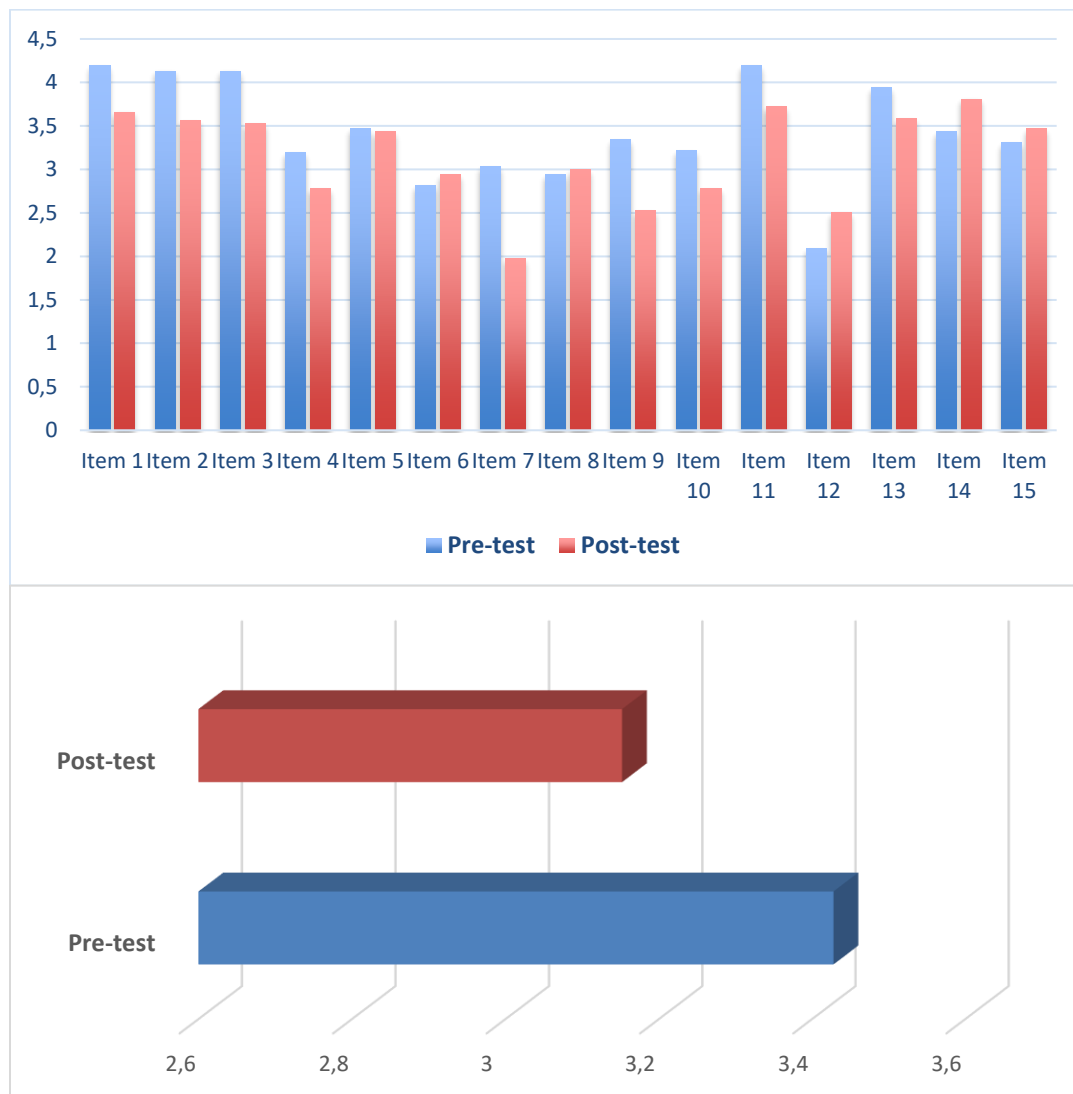
According to Table 24 and Figure 20, notable changes in engagement levels were observed for various aspects. In general, the overall engagement demonstrated a drop from 3,428 in the pre-test to 3,152 in the post-test. Items 7 (excitement about assignments) and 9 (interest in doing assignments) both exhibited substantial declines. Item 7 saw a significant drop from a pre-test mean of 3.03 to a post-test mean of 1.97, indicating a marked decrease in enthusiasm for assignments. Similarly, Item 9 displayed a significant decrease, with the pre-test mean of 3.34 dropping to 2.53

in the post-test. Conversely, Item 15 (the integration of subjects from different disciplines into my general knowledge) showed a modest improvement, with a mean score increasing from 3,31 to 3,47. Moreover, Item 14 (integration of acquired knowledge in solving problems) demonstrated the highest positive change, with the mean score rising from 3.44 to 3.81, indicating a substantial improvement in applying knowledge to solve new problems.

Table 24.

Control Group Pre/Post-test Comparison (Introverts)

	N	Pre-test	Post-test
Item 1	32	4,19	3,66
Item 2	32	4,13	3,56
Item 3	32	4,13	3,53
Item 4	32	3,19	2,78
Item 5	32	3,47	3,44
Item 6 ^R	32	2,81	2,94
Item 7	32	3,03	1,97
Item 8	32	2,94	3
Item 9	32	3,34	2,53
Item 10	32	3,22	2,78
Item 11	32	4,19	3,72
Item 12	32	2,09	2,5
Item 13	32	3,94	3,59
Item 14	32	3,44	3,81
Item 15	32	3,31	3,47
Overall	32	3,428	3,152

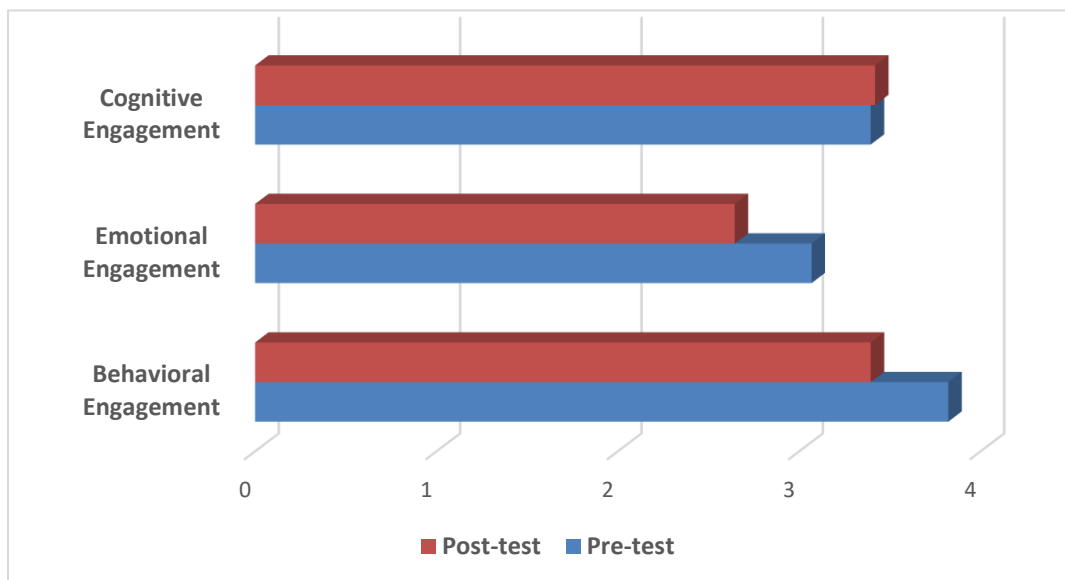
Figure 20.*Control Group Pre/Post-test Comparison (Introverts)*

According to Figure 21, the Pre-test Mean for Behavioral Engagement was 3,822, which decreased significantly to 3,394 in the Post-test. This indicates an average reduction in students' observable engagement behaviors, highlighting a substantial shift. Emotional Engagement, with a Pre-test Mean of 3,068, saw a notable drop to 2,644 in the Post-test. This decrease reflects a significant decline in students' emotional engagement, suggesting less positive emotional experiences related to their educational activities. In contrast, Cognitive Engagement showed a

modest increase, with the Pre-test Mean at 3,394 and the Post-test Mean at 3,418. This suggests that, on average, cognitive engagement experienced only a slight shift, implying that students' intellectual involvement remained relatively constant.

Figure 21.

Control Group Pre/Post-test Dimensional Comparison (Introverts)



5.2.2.2. Experimental Group

The provided data in Table 25 and Figure 22 encompasses pre-test and post-test mean scores for different engagement items before and after the intervention (experiment). Notable shifts in engagement levels were observed across these items, the overall mean demonstrated a decent increase from 3,44 in the pre-test to 3,58 in the post-test. Item 1 (paying attention in class) displayed a slight increase, with the mean score going from 3.92 in the pre-test to 4.06 in the post-test, indicating improved attentiveness. Item 2 (following university rules) demonstrated a substantial increase, with the mean score rising from 3.63 to 3.96, signifying a stronger commitment to following rules. Item 6 (feeling accomplished at the university) displayed a slight decrease, going

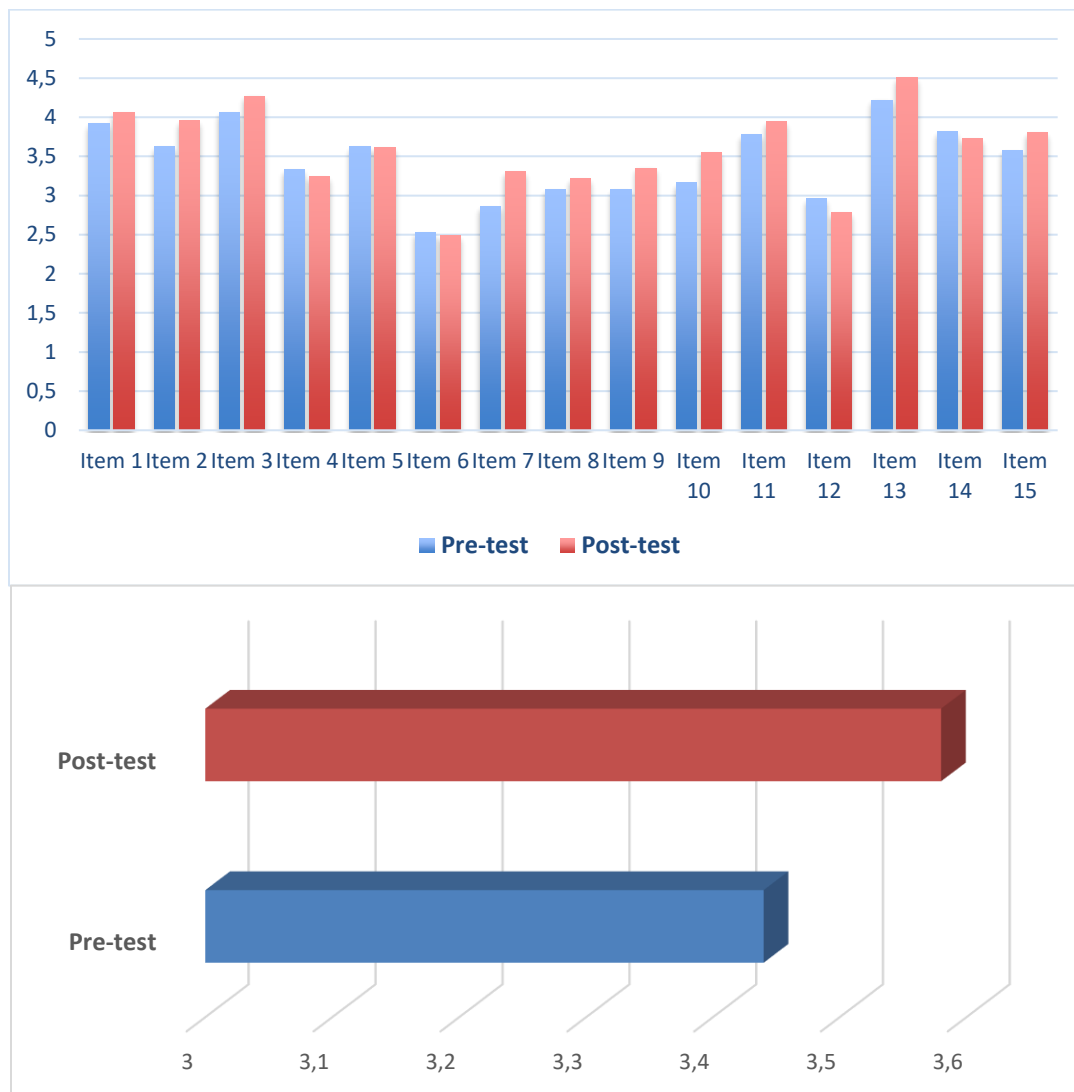
from 2.53 to 2.49 in the mean score which indicates an increase in engagement since this item is reversed. Some items, such as Item 3 (on-time completion of homework) and Item 7 (excitement about assignments), displayed marked increases in engagement. For Item 3, the mean score rose from 4.06 in the pre-test to 4.27 in the post-test, indicating a substantial improvement in students' adherence to homework deadlines. Likewise, Item 7 demonstrated a significant rise in excitement about assignments, with the mean score increasing from 2.86 to 3.31. Conversely, some items experienced decreases in engagement. For instance, Item 4 (asking questions and participating in debates) showed a slight decline, with the mean score going from 3.33 to 3.24. Item 5 (participation in group assignments) exhibited a minor decrease, with a pre-test mean of 3.63 and a post-test mean of 3.61. Furthermore, item 8 (liking being at the university) demonstrated a noteworthy increase, with the mean score going from 3.08 to 3.22, revealing a stronger affinity for the university environment. Similarly, Item 9 (interest in doing assignments) displayed a substantial increase, with the mean score rising from 3.08 to 3.35, indicating heightened interest in assignment tasks. Furthermore, item 10 (classroom interest) showed a notable increase, with the pre-test mean of 3.16 rising to 3.55 in the post-test, indicating heightened classroom interest. Item 11 (questioning oneself during reading) displayed an increase, with the mean score going from 3.78 to 3.94, signifying enhanced engagement during reading activities. However, Item 12 (engaging with external individuals on class matters) demonstrated a slight decrease, with the mean score declining from 2.96 to 2.78. In contrast, Item 13 (solving word meaning problems) exhibited a substantial increase, with the mean score growing from 4.22 to 4.51, reflecting proactive efforts in understanding word meanings. Item 14 (integrating acquired knowledge) showed a minor decrease, with the mean score declining from 3.82 to 3.73, indicating a slight reduction in the application of acquired knowledge to problem-solving. Lastly, Item 15 (integrating knowledge across disciplines) exhibited an

increase, with the mean score rising from 3.57 to 3.80, demonstrating improved engagement in integrating knowledge from different disciplines into general knowledge.

Table 25.

Pre/Post-test Experimental Group Comparison

	N	Pre-test Mean	N	Post-test Mean
Item 1	51	3,92	49	4,06
Item 2	51	3,63	49	3,96
Item 3	51	4,06	49	4,27
Item 4	51	3,33	49	3,24
Item 5	51	3,63	49	3,61
Item 6 ^R	51	2,53	49	2,49
Item 7	51	2,86	49	3,31
Item 8	51	3,08	49	3,22
Item 9	51	3,08	49	3,35
Item 10	51	3,16	49	3,55
Item 11	51	3,78	49	3,94
Item 12	51	2,96	49	2,78
Item 13	51	4,22	49	4,51
Item 14	51	3,82	49	3,73
Item 15	51	3,57	49	3,80
Overall	51	3,44	49	3,58

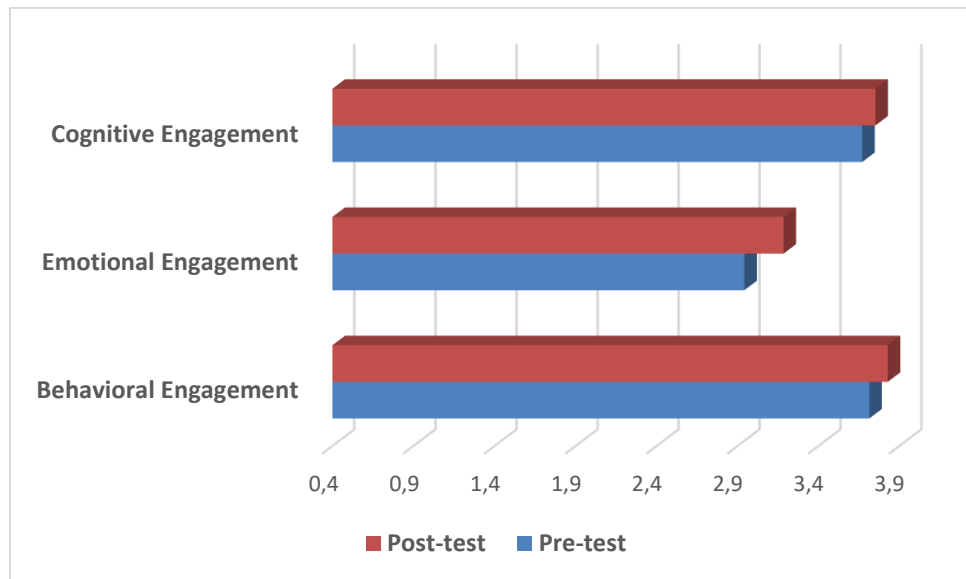
Figure 22.*Pre/Post-test Experimental Group Comparison*

In examining the three dimensions of engagement before and after the intervention we compare pre-test and post-test mean scores. Notably from Figure 23, behavioral engagement exhibited a positive increase, with mean scores rising from 3.714 in the pre-test to 3.828 in the post-test, reflecting an enhancement in students' active participation and conduct. Emotional engagement also demonstrated improvement, as the pre-test mean of 2.942 increased to 3.184 in the post-test, indicating increased enthusiasm and emotional connection to the educational

experience. Furthermore, cognitive engagement displayed growth, with the pre-test mean of 3.67 rising to 3.752 in the post-test, suggesting enhanced critical thinking and deeper understanding.

Figure 23.

Experimental Group Pre/Post-test Dimensional Comparison



5.2.2.2.1. Introverts as a Focus Group

By comparing pre-test and post-test mean scores in Table 26 and Figure 24, notable changes in engagement levels were observed for all items. Several items displayed increases in post-test mean scores, indicating improvements in student engagement. For example, Item 1 (paying attention in class) saw a modest increase from a pre-test mean of 4.00 to a post-test mean of 4.03. Similarly, Item 2 (following university rules) exhibited an even more substantial increase, with the mean score rising from 3.67 to 4.03, highlighting a stronger commitment to adhering to university rules. Item 3 (on-time completion of homework) displayed significant improvement, with the mean score increasing from 3.93 to 4.21, reflecting enhanced punctuality in homework submissions. In contrast, some items experienced slight decreases in engagement, such as Item 4 (asking questions and participating in debates), with the mean score declining from 3.07 to 3.00. Item 5 (participation

in group assignments) also showed a minor decrease, with the pre-test mean of 3.53 dropping to 3.28 in the post-test.

Moreover, Item 6 (feeling accomplished at this university) displayed a minor increase from a pre-test mean of 2.57 to a post-test mean of 2.59, suggesting a slight drop in feelings of accomplishment. Item 7 (feeling excited about having assignments) exhibited a significant increase, with the mean score rising from 2.70 to 3.14, indicating a substantial boost in excitement about assignments. Similarly, Item 8 (liking being at the university) showed a minimal change, maintaining a pre-test mean of 2.90 and a post-test mean of 2.90. In contrast, Item 9 (interest in doing assignments) demonstrated a substantial increase, with the mean score rising from 2.87 to 3.17, signifying increased interest in assignment tasks. Item 10 (My classroom is an interesting place to be) displayed an improvement, with the pre-test mean of 3.07 increasing to 3.52 in the post-test, highlighting a heightened interest in the classroom. Item 11 (When I read a book, I question myself to make sure I understand the subject I'm reading about) exhibited an increase, with the mean score rising from 3.70 to 3.97, suggesting enhanced engagement during reading activities. On the other hand, item 12 (I talk to people outside university on matters that I learned in class) demonstrated a slight decrease, with the mean score declining from 2.63 to 2.55.

However, item 13 (If I do not understand the meaning of a word, I try to solve the problem, for example, by consulting a dictionary or asking someone else) displayed a substantial increase, with the mean score growing from 4.30 to 4.52, reflecting proactive efforts in understanding word meanings. Item 14 (I try to integrate the acquired knowledge) showed some increase, with the mean score rising from 3.70 to 3.83, indicating more enthusiasm in applying acquired knowledge to problem-solving. Finally, Item 15 (I try to integrate subjects from different disciplines into my

general knowledge) exhibited a slight decrease, with the pre-test mean of 3.77 decreasing to 3.72 in the post-test.

Table 26.

Experimental Group Pre/Post-test Comparison (Introverts)

	N	Pre-test Mean	N	Post-test Mean
Item 1	30	4,00	29	4,03
Item 2	30	3,67	29	4,03
Item 3	30	3,93	29	4,21
Item 4	30	3,07	29	3,00
Item 5	30	3,53	29	3,28
Item 6	30	2,57	29	2,59
Item 7	30	2,70	29	3,14
Item 8	30	2,90	29	2,90
Item 9	30	2,87	29	3,17
Item 10	30	3,07	29	3,52
Item 11	30	3,70	29	3,97
Item 12	30	2,63	29	2,55
Item 13	30	4,30	29	4,52
Item 14	30	3,70	29	3,83
Item 15	30	3,77	29	3,72
Overall	30	3,36	29	3,497

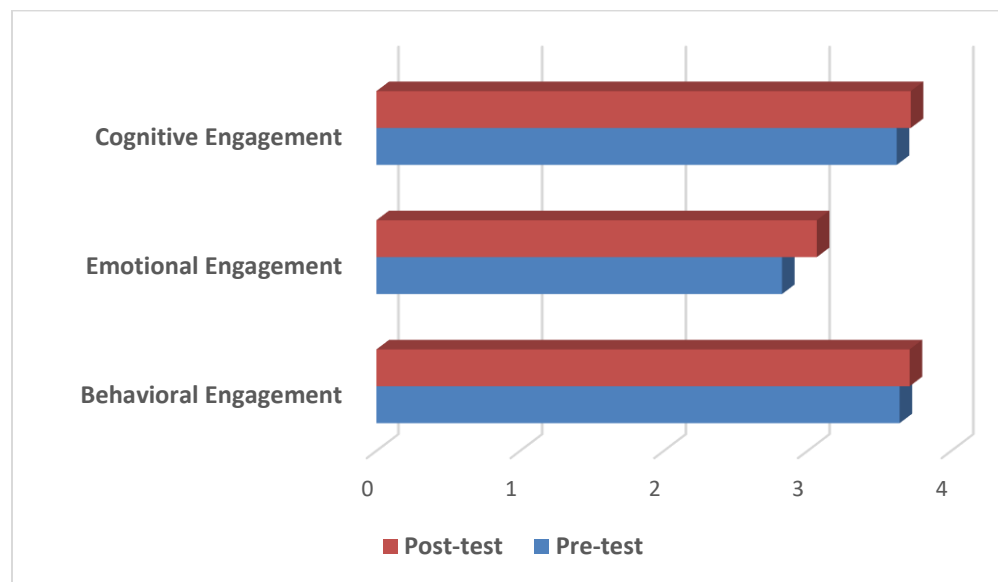
Figure 24.*Experimental Group Pre/Post-test Comparison (Introverts)*

By analyzing the three dimensions of engagement before and after the intervention with introverts in Figure 25, notable changes in engagement levels were observed in each dimension. Behavioral engagement demonstrated an increase, with the pre-test mean of 3.64 rising to 3.71 in the post-test, indicating improved participation and conduct in educational activities. Emotional engagement also exhibited growth, with the pre-test mean of 2.822 increasing to 3.064 in the post-

test, reflecting increased enthusiasm and a stronger emotional connection to the learning experience. Cognitive engagement displayed improvement as well, with the pre-test mean of 3.62 rising to 3.718 in the post-test, suggesting enhanced critical thinking and deeper understanding.

Figure 25.

Experimental Group Pre/Post-test Dimensional Comparison (Introverts)



5.2.3. USEI Reliability and Validity

Cronbach's Alpha is employed in the current study to assess the reliability of the inventory, the items within a scale, or their internal consistency. Cronbach's Alpha typically ranges from 0 to 1, where higher values indicate greater internal consistency among the items. Consequently, the study yields the following outcome.

Table 27.

Experimental Group Reliability

Cronbach's Alpha	N of Items
,817	15

In Table 27, the value of Cronbach's Alpha is 0.817. In terms of reliability assessment, this indicates a very good internal consistency. It suggests that the items within the measurement instrument used for the experimental group are highly reliable and are likely to measure a consistent underlying construct.

The validity of the correlations in Table 28 is supported by several key considerations. The results of the correlations are statistically significant at either the 0.01 or 0.05 significance level (1-tailed), indicating that the observed relationships are unlikely to have occurred by random chance. Additionally, the use of a sample size of 30 for each correlation is reasonable for conducting correlation analysis. The direction and magnitude of the correlations align with theoretical expectations related to student engagement, with positive engagement behaviors positively correlated and negative engagement behaviors negatively correlated. The use of 1-tailed significance levels is appropriate given the specified direction of relationships based on theory.

Table 28.*Experimental Group Validity*

	Correlation	Significance (1-tailed)
Item 1	0.573**	p = 0.000
Item 2	0.363*	p = 0.024
Item 3	0.307*	p = 0.050
Item 4	0.491**	p = 0.003
Item 5	0.579**	p = 0.000
Item 6 ^R	-0.097	p = 0.305
Item 7	0.424**	p = 0.000
Item 8	0.496**	p = 0.000
Item 9	0.336*	p = 0.035
Item 10	0.419*	p = 0.011
Item 11	0.240	p = 0.101
Item 12	0.526**	p = 0.001
Item 13	0.351*	p = 0.028
Item 14	0.507**	p = 0.002
Item 15	0.459**	p = 0.005

Note. R=Reversed

5.2.4. Analysis of the Students' Questionnaire

The sample of participants included 54 students who received the treatment, that is, the experimental group only. The questionnaire was administered at the post-test phase.

Section One: General Information

Table 29.

Gender Distribution

	Frequency	Percentage
Male	13	24,1%
Female	41	75,9%
Total	54	100%

Overall, Table 29 shows that there are 13 males and 41 females in the total count of 54. Females make up the majority of the population, accounting for approximately 75.9%, while males make up about 24.1%.

Section Two: Students' Perception

Table 30 contains responses to 15 statements, with corresponding percentage values across five levels of agreement/disagreement. Notable findings include high agreement regarding the perceived effectiveness of the course materials (88.9% Strongly Agree or Agree) and the substantial learning experience (90.7% Strongly Agree or Agree). Students also acknowledge the need for effort in the course (72.2% Strongly Agree or Agree) and strong communication with both peers (79.6% Strongly Agree or Agree) and the instructor (74.1% Strongly Agree or Agree). The majority of respondents also affirmed that their out-of-class experiences were applied to practical applications (77.8% Strongly Agree or Agree). Availability of technical support and resources was seen as beneficial (77.8% Strongly Agree or Agree), and a considerable percentage expressed interest in taking a similar course in the future (77.7% Strongly Agree or Agree). While many respondents agreed that they explored their own learning strategies (66.6% Strongly Agree or Agree), a significant portion felt they needed technical assistance (68.9% Strongly Agree or Agree). The routine of the class was generally well-received (75.9% Strongly Agree or Agree), and students

found videos more effective for learning (81.4% Strongly Agree or Agree) and increasing in-class participation (79.6% Strongly Agree or Agree).

Table 30.

Students' Perception of the Flipped Classroom as an Instructional Model

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. During the oral session, I communicated a lot with other students.	7 (31,5%)	26 (48,1%)	5 (9,3%)	4 (7,4 %)	1 (1,9%)
2. During the oral session, I talked with Ms. Bouchareb	13 (24,1%)	27 (50%)	11 (20,4%)	3 (5,6%)	0
3. I had to work hard in this course.	18 (33,3%)	21 (38,9%)	8 (14,8%)	6 (11,1%)	1 (1,9%)
4. I learned a lot in this course.	31 (57,4%)	18 (33,3%)	5 (9,3%)	-	-
5. The assignments and projects I have worked on in this course deal with real life applications and information.	22 (40,7%)	25 (46,3%)	5 (9,3%)	2 (3,7%)	-
6. The availability of course materials, communication, and assessment tools helped me improve my learning.	16 (29,6%)	33 (61,1%)	3 (5,6%)	2 (3,7%)	-
7. I have applied my out-of-class experiences and learned from practical applications.	15 (27,8%)	27 (50%)	12 (22,2%)	-	-
8. I explored my own strategies for learning.	14 (25,9%)	22 (40,7%)	16 (29,6%)	2 (3,7%)	-
9. I needed technical assistance for this class.	1 (1,9%)	15 (27,8%)	22 (40,7%)	12 (22,2%)	4 (7,4%)
10. Availability and access to technical support and resources helped me improve my learning.	8 (14,8%)	34 (63%)	11 (20,4%)	1 (1,9%)	-

11. I would choose to take another course like this one.	26 (48,1%)	16 (29,6%)	10 (18,5%)	2 (3,7%)	-
12. I like the routine in this class.	24 (44,4%)	17 (31,5%)	7 (13%)	6 (11,1%)	-
13. I like the materials (videos, articles) provided in this course.	30 (55,6%)	18 (33,3%)	5 (9,3%)	1 (1,9%)	-
14. The materials provided helped maintain my interest in the course	18 (33,3%)	27 (50%)	7 (13%)	2 (3,7%)	-
15. The use of videos enabled me to learn more effectively than lecture alone	22 (40,7%)	22 (40,7%)	7 (13%)	3 (5,6%)	-
16. Watching the videos increased my in-class participation	14 (25,9%)	29 (53,7%)	8 (14,8%)	3 (5,6%)	-

Section Three: Students' Preferences

The first question in this section deals with insights into aspects that contribute to an enhanced learning experience.

As demonstrated in Table 31, 15 respondents (27.8%) report limited availability and access to online course materials. In contrast, a significant number of 24 respondents (44.4%) acknowledge the pivotal role of enhanced communication, including tools like Facebook, email, and online discussions. Evaluation, feedback, and grading tools are similarly acknowledged by 15 respondents (27.8%). Furthermore, 9 respondents (16.7%) find the web environment's ease of use beneficial. In contrast, in-class group discussion is highly favored by 42 respondents (77.8%), emphasizing the importance of interactive and collaborative learning. Additionally, group collaboration resonates with 28 respondents (51.9%). Finally, 26 respondents (48.1%) value the autonomy of working on assignments and classwork independently.

Table 31.*Aspects that Help Improve the Learning Experience*

Aspect	Frequency	Percentage
Availability and access to online content	15	27.8%
Enhanced communication	24	44.4%
Evaluation, feedback, and grading tools	15	27.8%
Ease of use of the Web environment	9	16.7%
In-class group discussion	42	77.8%
Group collaboration	28	51.9%
Working on assignments and class work alone	26	48.1%
Total	54	100%

The second question of this section is an open question that deals with aspects of the course that have helped improve students' learning. Students have highlighted a range of aspects within the course that have significantly contributed to improving their learning experience. Many emphasized the importance of communication, both in classroom discussions and through technology, such as Facebook, emails, and videos. Group work and discussions played a crucial role in building confidence, improving vocabulary, and enhancing communication skills. The engaging teaching methods, including presentations, conversations, and educational games, were also lauded for their impact on learning. The teacher's personality, teaching style, and flexibility in course preparation choices were recognized as positive factors. Access to course materials, online resources like English videos, and the use of technology (laptops and DataShow) were appreciated for making learning more accessible and engaging. Overall, students found that the course's

interactive and varied approach, combined with effective communication, helped them develop their language skills, enhance their confidence, and stay motivated in their learning journey.

In addition, students expressed in the following question what they liked most about the flipped classroom experience. Their feedback on the flipped classroom experience highlights a variety of positive aspects. They appreciated the opportunity to engage in communication and discussions both at home and in class, fostering collaborative and independent learning. Many found that pre-preparation at home and access to course materials improved their understanding of topics and vocabulary. The method encouraged them to take ownership of their learning, and they valued the chance to practice, discuss, and interact with classmates and the teacher. Students lauded the use of interesting materials, teacher feedback, and interactive activities within the classroom. Overall, they felt that the flipped classroom approach provided a structured and organized way to learn while offering flexibility and fostering independent learning skills, ultimately enhancing their engagement and understanding of the course content.

Table 32 presents a compelling picture of student attitudes toward the integration of educational technology into learning. An overwhelming 96.3% of respondents express strong support for the use of technology in their educational journey. On the other hand, only a small minority, accounting for 3.7% of respondents, opposes this integration, indicating minimal resistance.

Table 32.

Supporting the Integration of Educational Technology in Learning

	N	Percentage
No	2	3,7%
Yes	52	96,3%
Total	54	100%

In justifying their answers, many students expressed their appreciation of the benefits of technology, citing that it facilitates learning, caters to different learning styles, and makes information more accessible. They note that technology improves language skills, engages students, and encourages individual growth. However, some express concerns, such as the potential for technology to disrupt in-person communication and concentration. Overall, the majority of students acknowledge the positive impact of technology in education, highlighting its role in making learning more engaging, accessible, and tailored to various learning styles. They recognize the practicality and motivation that technology brings to modern education, including easy access to information, the use of audiovisual materials, and the internet's wealth of resources.

The data in Table 33 reveals a clear preference for mobile devices among respondents, with a significant 88.9% utilizing them for their educational needs. Laptops are the second most popular choice, employed by 46.3% of the surveyed individuals. In contrast, tablets and desktop computers are used by a smaller percentage, 1.9%, and 13%, respectively. It is noteworthy that some respondents may use multiple devices for learning purposes.

Table 33.

Technological Device/s Used during Learning

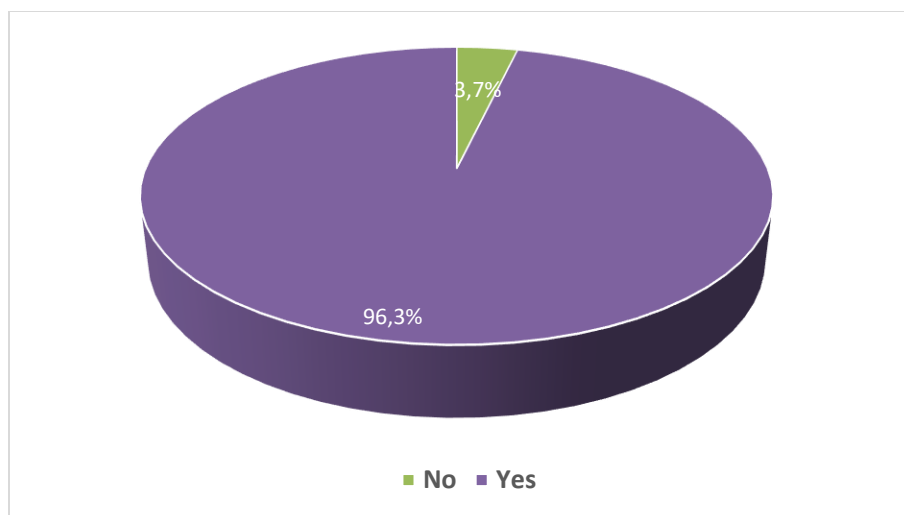
Device	N	Percentage
Mobile	48	88,9%
Tablet	1	1,9%
Laptop	25	46,3%
Desktop Computer	7	13%
Total	54	100%

Section Four: Students' Personality Awareness

The first question of this section deals with whether the flipped classroom contributed to students' participation and engagement in learning taking into consideration being an introvert or extrovert. The data in Figure 26 underscores a notable consensus among students, irrespective of their introverted or extroverted tendencies, regarding the effectiveness of the flipped classroom approach. According to the figure, an overwhelming 96.3% of respondents, which represents the majority, expressed a positive perception, stating that this teaching method contributed significantly to their participation and engagement in learning. Conversely, a mere 3.7% indicated reservations about its impact.

Figure 26.

The Flipped Classroom Contribution to Students' Participation and Engagement



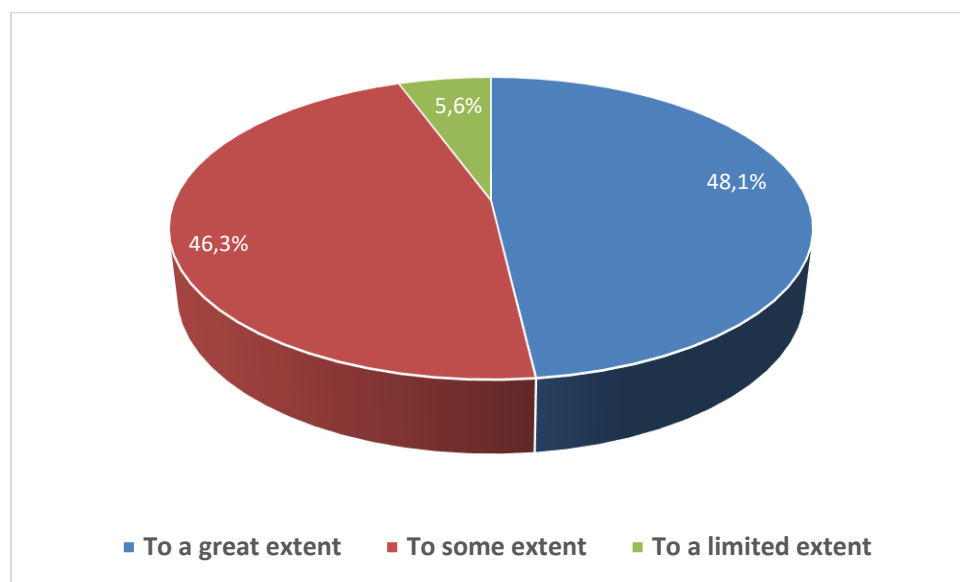
In justifying their choice, students express that the opportunity to prepare the lesson at home before participating in class not only boosts their confidence but also encourages them to share their thoughts and engage in discussions more readily. Many introverted students note a shift in their personalities, becoming more extroverted in class, as they feel well-prepared and familiar with the lesson content. Additionally, they recognize that this method enables them to contribute more

actively to class activities, enhancing their listening, speaking, and audiovisual skills. Overall, the flipped classroom effectively fosters student engagement, even for introverts, by providing an environment where pre-preparation empowers them to participate with confidence, improve their learning, and interact more effectively with both the lesson and their peers.

The next question in this section tests the degree of enjoyment of the flipped classroom by students. According to Figure 27, nearly half of the respondents, constituting 48.1%, found the method to be enjoyable "to a great extent," while a substantial 46.3% reported enjoying it "to some extent." Collectively, this indicates that a significant majority, approximately 94.4%, had a positive experience with the flipped classroom, either highly or moderately enjoyable. Only a small fraction, 5.6%, indicated limited enjoyment, suggesting that the approach resonates positively with most students. Lastly, no one of the participants reported that their experience was not enjoyable at all.

Figure 27.

Degree of Enjoyment of the Flipped Classroom



According to Table 34, a significant majority of respondents reported improvements in class participation (75.5%), group work (50.9%), risk-taking (54.7%), attention and focus (47.2%), and

interest in learning (47.2%). Additionally, approximately 40% of participants mentioned increased willingness to ask questions, while 30% felt the approach helped them overcome their fear of speaking. Smaller percentages (15.1%) reported higher motivation.

Table 34.

The Flipped Classroom Improving Learning Engagement

Aspect	N	Percentage
Class participation	40	75,5%
Asking questions	21	39,6%
Group work	27	50,9%
Risk-taking	29	54,7%
Motivation	8	15,1%
Overcoming fear of speaking	16	30,2%
Attention and focus	25	47,2%
Interest in learning	25	47,2%
Total	54	100%

Table 35 summarizes the perceived impact of the flipped classroom approach on students' learning experiences, with a focus on whether these effects varied based on introvert/extrovert characteristics. Among the aspects of improvement assessed, active learning emerged as the most prominent benefit, with 72.5% of respondents. Student-centered learning was the second most positively affected dimension, with 51% of respondents recognizing its improvement. Critical thinking received positive feedback from 37.3% of participants, while reflective practice and autonomy/lifelong learning each saw improvements mentioned by approximately 29.4% of respondents. In contrast, fewer participants noted improvements in knowledge retention (21.6%), and the smallest percentage (11.8%) found the approach impactful in grasping learning materials.

Table 35.*Aspects the Flipped Classroom Improved for Introverts/Extroverts*

Aspect	N	Percentage
Active learning	37	72,5%
Retention of knowledge	11	21,6%
Critical thinking	19	37,3%
Reflective practice	15	29,4%
Grasping learning materials	6	11,8%
Student-centered learning	26	51 %
Autonomy and life-long learning	15	29,4%
Total	54	100%

Section five: Suggestions

The last section of the questionnaire holds students' suggestions and feedback about their learning with the flipped classroom as a model of instruction. The feedback provided on the flipped classroom method is overwhelmingly positive. Students express their appreciation for the increased engagement, motivation, and improved confidence in speaking and presenting their work in class. They find the method clear, enjoyable, and well-structured, with a positive impact on various skills, such as critical thinking and collaboration. The flipped classroom is praised for promoting equal opportunities for all students to participate and eliminating the fear of making mistakes. It is seen as suitable for both introverted and extroverted students, and there is a suggestion to integrate theater elements for added fun and motivation. Overall, the flipped classroom approach is well-received and considered effective in enhancing the learning experience by fostering active participation, question-asking, and debates while providing a comfortable and motivating learning environment.

5.2.5. Analysis of the Teachers' Interview

This interview analysis showcases the experiences and insights of five educators with diverse backgrounds and teaching contexts regarding the implementation of the flipped classroom instructional model. To analyze the teachers' interview as one of the research tools used in this research, we start by reviewing the different parts of the interview.

Part One: Background Information

This section is dedicated to the acquisition of fundamental background details about the educators, including their educational qualifications, the duration of their English teaching experience in the university context, their areas of expertise, the durations during which they implemented the flipped classroom methodology, and the specific course modules they conducted using this approach.

Q1 Academic Degree

One interviewee teacher has a professorship degree in Didactics while three other teachers hold a PhD in educational psychology, Literature, and Applied Linguistics. The last teacher is a PhD candidate with a Master's degree in Linguistics.

Q2 Experience in Teaching English at University

One of the interviewed educators demonstrates a profound wealth of pedagogical experience, encompassing 26 years in secondary education, alongside 11 years within the university context. A second participant in our study has devoted seven years to the vocation of university instruction. A third respondent can be acknowledged for spending over 15 years in the realm of academia, while the fourth one is distinguished by a noteworthy 16-year dedication to this pedagogical domain. The final teacher in our study presents an eight-year experience in the field of teaching English at university.

Q3 Field of Study

The first teacher is specialized in educational psychology with a focus on research methodology and E-Learning. The second one is in the domain of applied linguistics with a focus on English for specific purposes (ESP) while teacher 3 deals mainly with Didactics, linguistics, and TEFL. The other two teachers are specialized in Linguistics and English literature respectively.

Q4 Full-Time Teacher or Part-Time Teacher

Four teachers are full-time teachers at the university while one teacher is a part-time teacher.

Q5 Using the Flipped Classroom as an Instructional Model

In this section, teachers were asked about how long they have been using the flipped classroom as an instructional model. The first teacher said it started at the beginning of 2020 during COVID-19 when they were asked by the ministry to initiate hybrid learning at university. Another teacher said he used it for three semesters which is the equivalent of one year and a half. The third teacher used the flipped classroom for a while and there was a cut-off before she resumed using it again during COVID-19 with an overall use of three years. For the fourth teacher, she started using it in 2007 even before fully understanding the concept as she said: “I started using it since 2007 without even knowing what it was. Since my magister 2007, my thesis was about learner autonomy where I was doing research on making students more active taking charge of their learning, and making the class student-centered” and she remained using it until now. The last teacher said she used the flipped classroom in 2017 and then again in 2020 and 2021 during COVID-19.

Q6 Modules Taught via the Flipped Classroom

Regarding the modules being taught via the flipped classroom, the first teacher was teaching the E-learning module and communicative communication practice. The second teacher taught linguistics for one semester and discourse analysis for two semesters using the flipped classroom.

Furthermore, the third teacher said she started teaching via flipped classroom when she taught pre-CELTA teachers, and then at university, she used the flipped classroom in oral expression classes. However, the fourth teacher used the flipped classroom in teaching Study skills for 1st-year students, TEFL for Master 1 students, and Didactics for Master 2 students. The last teacher was teaching alternative literature then contemporary world literature and grammar all using the flipped classroom.

Part Two: Teaching via the Flipped Classroom Model

The second part of the interview focuses on teachers' perspectives regarding flipped classroom teaching. They speak about differences between flipped and traditional teaching, benefits, materials used, engagement of students, students' differences, and their personal recommendations.

Q7 Conventional Teaching vs the Flipped Classroom Method

In highlighting the main differences between teaching with a conventional method and teaching via a flipped classroom, the first teacher describes the initial challenges of transitioning from traditional teaching methods to the flipped classroom. He mentions that this change was difficult because both teachers and students were not accustomed to using technology in the classroom. However, over time, as everyone became more familiar with the approach, teaching in the flipped classroom became easier. The second teacher portrays the major difference as the shift from stand-up explanations in the classroom to more home-based learning for students. In addition, the flipped classroom provides a more learner-centered approach, allowing for increased class interaction, individualized learning, and the ability for students to work at their own pace.

Moreover, the third teacher explains the difference that the flipped classroom offers more time for activities, discussions, and engagement. Students come to class well-prepared and aware

of the topics to be covered, which is not always the case in traditional classes. Finally, large live classes tend to benefit more from the flipped classroom compared to traditional classes. Teacher 4 mentions that “traditional teaching is teacher-centered where the teacher is doing the lesson and the students are being passive while the flipped classroom is learner-centered, students do the work, do their own research, and prepare their questions to ask the teacher. The session is more like a debate, question-answer, and group discussion. The students are motivated and active they take notes and give answers because they have their own knowledge about the lesson after they did their research”. The last teacher elaborates on how the flipped classroom allows for more creativity in designing activities and improved time management with more time for practice. However, it includes challenges such as internet connectivity issues and students' readiness to work independently.

Q8 Advantages of Flipped Classroom Teaching

The first teacher mentions that the flipped classroom approach provides students with a wide range of materials, freeing them from reliance on textbooks and traditional lessons. It introduces new technologies, such as smartphones and tablets, and authentic audiovisual materials that engage students. Also, it encourages students to be independent learners, but this can be more challenging for some students who are used to passive learning. Moreover, teacher 2 explains the benefits by saying: “Learner centeredness is the major difference, giving many places for the learner to be active in the classroom with more class interaction, more activity in learning experiences, more individualized learning. Students can work at their own pace; they can review materials so many times. for the teacher, I could spend more time on activities in class because the class time is just for the activities”.

Furthermore, the third teacher explains how the flipped classroom allows for more time for assessment, assignments, and activities, enhancing student understanding. It encourages students to interact, participate, and become active learners by engaging with pre-class materials. On the other hand, the fourth teacher says that the flipped classroom shifts from a teacher-centric approach to a student-centered one. Students can review lessons at their own pace and time and they are highly motivated and engaged, creating a positive learning atmosphere. Teacher 5 expresses how Flipped classrooms offer more opportunities for creativity and activity diversification. It attracts students who are comfortable with technology keeps them engaged and also accommodates learning at home, fostering a connection to education. In addition, it provides extra time for both teachers and students to practice.

Q9 Creating Flipped Lessons vs Using Ready-made Lessons

When asked if the teachers made their own flipped lessons or used ready-made lessons, the first teacher mentioned that they developed their own flipped lessons because existing materials were not suitable for the Algerian context. Approximately 80% of the courses were prepared by him to adapt to the local culture and identity of the students. Teacher 2 creates his own flipped lessons, especially in subjects like discourse analysis. But sometimes he uses available sources like daily life conversations, political issues, and science materials to enhance their lessons. Likewise, the third teacher selects ready-made materials but is highly selective, tailoring content to suit the level of learners. The choice of materials may vary based on students' proficiency levels and specific learning objectives.

Additionally, the fourth teacher initially used her own lessons, which aligned with the flipped classroom model, and kept developing her own lessons throughout the years. Similarly, the fifth teacher created her own flipped lessons as she could not find ready-made ones.

Q10 Flipped Lessons Materials

Teachers were asked to describe the kind of activities and materials used in their flipped lessons. Teacher 1 describes using activities such as oral presentations, debates, role-play, and quizzes. These activities encourage collaboration, active participation, and research among students. He used formative and summative assessments, including quizzes, to gauge students' understanding and progress. Quizzes were used to keep students engaged and ensure they were actively learning. Teacher 2 says: “For Discourse Analysis, it depends mainly on the text, the data is just textual data, I helped with available sources, like daily life conversations, political issues, sometimes science images videos, and all different levels or modalities”.

Activities and materials that were used by teacher 3 depend on the specific language skills being targeted, such as vocabulary, grammar, listening, or speaking. The choice of materials and activities is aligned with the learning objectives of each lesson. She says: “So I may use audio-visual for vocabulary and grammar. But when I target listening and speaking, I may give a video to summarize, for instance, a story, a video of 10 minutes, no more. And if I want, for instance, to detect, or to put a finger on a specific detail I give a video, and I'm going to ask you a question about a specific detail”. The fourth teacher explains how she gives the students lessons and handouts before the session or sends them via email. Also, in each lesson, she gives them homework about the lesson in addition to the preparation of the next lesson depending on the lesson and the timing. The last teacher utilized YouTube videos created by her and prepared PDF documents and lecture notes. She also employed platforms like Moodle for interactive and collaborative activities.

Q11 The Flipped Classroom Environment

To describe the learning environment during a flipped classroom session, the first teacher notes that the flipped classroom created an enjoyable and motivating setting for active students. However, it was challenging for lazy or less motivated students who preferred the traditional teaching approach. He says: “There are two kinds of students, those active students who were really finding an enjoyable setting where they were involved in a collaborative work. They were really excited and concerned with the course and even involved in that course; because mainly they were bringing their own materials. But those lazy students found it even more difficult than the conventional way of learning; and even they asked me to go back to the conventional method, where they were assigned just a course and given handouts, then after that go home without doing anything”.

Teacher 2 mentions how the flipped classroom creates a different and more engaging learning environment compared to lecture-based instruction. While initially challenging, it becomes easier for teachers, especially those with experience, when motivated to adopt the model. Similarly, the third teacher expresses how in the flipped classroom there is a healthy atmosphere for oral expression classes. Students are encouraged to discuss, make errors, and take risks, which contributes to an enjoyable learning environment. Moreover, teacher 4 describes the flipped classroom environment as “very energetic, motivating, and engaging. Students are more comfortable, more at ease, they can show their real selves, they are interacting, they are a family sharing together, and they are appreciated as individuals”. The last teacher described the flipped sessions as distinct and humanly different but beneficial for fostering interaction and creativity.

Q12 Engagement and the Flipped Classroom

In this question, teachers were asked about their students' engagement while using the flipped classroom as an instructional model. Teacher 1 explained that his class was divided into three categories: Firstly, the active students who were highly engaged, with a commitment of nearly 90%. They diligently completed assignments and were readily available when needed. Secondly, there were the moderately engaged students, who were at a 50/50 level of engagement. They responded positively to content that interested them but were disengaged when it came to topics they found uninteresting. Finally, there were the passive students who preferred traditional learning methods over virtual environments. Next, teacher 2 mentions that learners in the flipped classroom are inevitably engaged due to the nature of class activities and the need to discuss, ask questions, and collaborate. The majority of class time is scheduled for activities, promoting student involvement and interaction.

Furthermore, the third teacher says that learners in the flipped classroom are generally very engaged. Introverted students and those with low self-esteem may require special attention and strategies to encourage participation. In the same vein, the fourth teacher describes her students as highly engaged and "sometimes even students ask trapped difficult questions to the teacher to show that they know very much about the topic". The last teacher describes the flipped classroom environment as mostly positive and encouraging

Q13 Learners' Differences

The interviewees were asked about learners' differences in their classes. Teacher 1 emphasized the importance of considering students' personality and learning styles. They tailored activities and assignments to match each student's characteristics and encouraged introverts to participate. Teacher 2 emphasizes how the flipped classroom model accommodates various

learning styles and individual differences. Different materials and in-class activities provide opportunities for students to work in groups, address their unique needs, and receive support from both the teacher and peers. Similarly, the third teacher says that learning styles are considered, and materials are diversified to accommodate visual, auditory, and kinesthetic learners. Group work and activities help address differences in student needs and preferences.

Additionally, teacher 4 agrees that she considers learners' differences by "trying to engage introverts who feel shy or hesitant ... so here you have to make them feel comfortable and at ease to participate, they feel invited and not make them feel forced because they will get a mental block and will not be able to engage. For learners' styles, I give handouts, they are good for the visuals. For the auditory learners, they listen and speak in class and interact. For the kinesthetic ones they get time to prepare at home and get involved in doing work". The last teacher acknowledges and addresses learners' personalities and learning styles to the best of their ability.

Q14 Personality Types and the Flipped Classroom

In this question, teachers are asked if they think the flipped classroom helps deal with different types of learners like extroverts and introverts. The first teacher mentions that the virtual environment is favorable for both extroverted and introverted individuals, with introverts benefiting especially. Extroverts adapt easily to public speaking and group activities. On the other hand, introverts thrive when given assigned roles within collaborative groups. This active participation boosts their self-confidence and encourages their engagement. However, if left to study alone, introverts may neglect the course due to their psychological traits. Moreover, the second teacher points out that introverted students benefit from online classes, as they tend to be good listeners and process information more attentively. This helps them understand the material in advance, reducing anxiety and boosting their confidence in class. They can also choose peers for

collaborative activities. In the flipped classroom setting, introverts find comfort in smaller groups, making participation less intimidating. They often prefer writing their thoughts down before speaking, which helps them feel more prepared. Also, extroverted students generally adapt well to these methods.

The third teacher discusses how introverts particularly in regular classroom settings, tend to remain introverted unless the teacher takes certain steps. In larger classes, introverts often stay introverted throughout the year, but in smaller classes, they may become more outgoing if the teacher fosters a friendly and accepting environment. To encourage introverts to open up, the teacher should implement pair work or group work. The teacher needs to guide introverts through certain steps to help them become more extroverted. Besides, the fourth teacher acknowledges that the flipped classroom helps with dealing with introverts and extroverts because “extroverts already have the opportunity of speaking in class. While introverts even if they are sure of the answer, they feel that they can’t answer the question. So, when they prepare the lessons and have the syllabus, they can be confident. In addition to that, in the classroom, they know they are welcome to speak and engage and answer or ask questions, they know what the teacher is expecting from them and the teacher makes them feel at ease to participate”.

The last teacher believes that the virtual component of flipped learning is particularly beneficial for introverted individuals. Introverts tend to gain more from this virtual aspect compared to extroverts, as extroverts often thrive in traditional, in-person classroom settings.

Q15 Introverts’ Engagement and the Flipped Classroom

This question deals with how the flipped classroom may help introverted students participate and engage more in learning. Teacher 1 mentions that the flipped classroom allowed introverted students to engage more, especially when they could work individually on technology-

related tasks, and that collaborative settings boosted their confidence and participation. Teacher 2 states that introverted students benefit from the flipped model, especially in online classes, where they can process and understand material before in-class discussions. The model reduces anxiety and increases confidence, enabling them to choose peers and work comfortably in small groups. Additionally, the third teacher acknowledges that the flipped classroom tends to help introverted students participate and engage more, but a strategic approach is necessary to gradually encourage them. The fourth teacher says that while teaching in the flipped classroom, introverts take the time to prepare their lessons independently at home, bolstered by a dependable syllabus that instills confidence. Furthermore, once in the classroom, they feel encouraged to speak up, actively engage, and pose questions without hesitation. They possess a clear understanding of the teacher's expectations and are put at ease by the teacher's support in their participation. Notably, teacher 5 says that the flipped classroom appears to help introverted students more, providing a comfortable learning environment.

Q16 Aspects of Enhancing Learners' Engagement

The first teacher states that the flipped classroom improved engagement by giving students a voice and choice in their learning and students felt motivated when they had control over their education. The second teacher emphasizes how the flipped classroom fosters learners' engagement by promoting activities such as asking questions, risk-taking, overcoming the fear of speaking, and generating interest in learning. The third teacher said class participation, asking questions, group work, risk-taking, motivation, overcoming the fear of speaking, attention, focus, and interest in learning, have been observed in her flipped classes. Furthermore, teacher 4 chose class participation, asking questions, group work, risk-taking, motivation, overcoming fear of speaking, attention and focus, interest in learning, and also critical thinking skills. The last teacher mentioned

that the flipped classroom enhanced students' risk-taking, attention, focus, question-asking, and interest in learning.

Q17 Pre-class Preparation

This question concerns the pre-class or in-home preparation that students need to do before coming to class in flipped learning. For the first teacher, he says that students were assigned tasks to prepare for the entire unit, which they completed at home and they were divided into groups to work on assignments, making in-class activities more interactive and collaborative. Teacher 2 mentions that students usually complete in-home activities one day before the classroom sessions, but the timing may vary based on scheduling and student preferences. Moreover, the third teacher states that most first-year students (approximately 95%) complete in-home activities before coming to class, with only a small percentage needing access to materials in the classroom. Similarly, teacher 4 says: “They do it always and even sometimes when I forget to ask them to do the homework, they ask what should they prepare for the next session because it became the routine of the class”. Most students of the last teacher often complete in-home activities before class.

Q18 Student Satisfaction with Flipped Classroom

Teachers were also asked about their students' satisfaction and enjoyment of the flipped classroom as an instructional model. The first one says that initially, some students were hesitant due to a lack of technology skills, but over time, the majority of students found the flipped classroom approach interesting and engaging. Likewise, teacher 2 explains how students' enjoyment of the flipped classroom varies depending on the module and students' interests, with more specialized topics, like discourse analysis, receiving positive feedback. However, the third teacher says that initially, students enjoyed the flipped classroom, but later, a return to traditional classes was preferred to change the routine and provide a lighter workload for students. The fourth

teacher states that the first time students were introduced to the flipped classroom, it was difficult for them because they did not form the habit but after they got used to it, it became part of the class's routine. Conversely, the last teacher said she distributed questionnaires for her students to ask them about their experience with the flipped classroom, and according to their answers, most students enjoyed the flipped classroom, only some students did not as they preferred traditional teaching methods that they are more accustomed to.

Q19 Recommending the Flipped Classroom for Enhancing Engagement

Teachers were asked if they recommend using the flipped classroom to enhance students' engagement. The first teacher recommends using the flipped classroom but stresses the importance of teacher training and a well-developed plan. He emphasizes that teachers need to have sufficient training in the use of technology for teaching, and there should be a national plan for implementation to avoid potential failures. Teacher 2 also recommends trying the flipped classroom, especially for practical modules, writing, and analysis. However, the effectiveness may vary across different subjects and student preferences. It is suggested that teachers experiment with the model and assess its suitability for their specific modules and students' needs. Moreover, the third teacher recommends using the flipped classroom based on their experience but notes that it faces challenges. She suggests that teachers may not adopt the model due to the increased workload and students' unfamiliarity with this type of teaching. In the same vein, teacher 4 says: "Yes, I strongly recommend it because it engages the students and it is the best way to help them memorize the lessons. It is a perfect way for engagement in the classroom and more interacting than conventional teaching". Despite the challenges, the last teacher recommends the flipped classroom due to its positive impact on creativity, motivation, and student engagement; she states: "As a teacher, I really enjoyed it and I really think that its positives and advantages are way more than its

disadvantages and drawbacks... I would recommend it because it is good and beneficial for the students and their learning, and it is good for creativity and motivation”.

Conclusion

In conclusion, this chapter has conducted an analysis of the data collected through various research instruments utilized in this study. The chapter has examined the data, with a specific focus on personality types, and the noteworthy of introverted students. The results showed that, in both groups, introverted students slightly outnumbered extroverted students. Specifically, the Experimental Group had 55.56% Introverted students and 44.44% Extroverted students. Furthermore, it has scrutinized the Post-test Phase, comparing the results to the pre-test findings. The control group experienced a decline in engagement, while the experimental group, including introverts, showed improvements in various dimensions of engagement.

Additionally, the chapter has delved into the insights derived from the students' questionnaire, covering their perspectives, preferences, personality awareness, and the valuable suggestions they provided. The students' feedback on the flipped classroom instructional model was highly positive, indicating that it effectively promotes engagement, active learning, and student participation. Students also demonstrated strong support for the integration of educational technology into their learning. Moreover, this chapter has also incorporated feedback from teachers regarding their experiences with teaching via the Flipped Classroom Model. They had used the flipped classroom for varying durations and taught a wide range of English subjects. Teachers emphasized the shift from teacher-centered to learner-centered teaching, highlighting the benefits of increased engagement, motivation, and personalized learning. The model was seen as beneficial for both introverted and extroverted students, promoting engagement and participation. With a thorough understanding of these analyses and findings, this chapter sets the stage for the next

chapter which includes a discussion of the results with recommendations and limitations of the study.

CHAPTER 6:

INTERPRETATION AND DISCUSSION

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Introduction

Chapter six delves into the intricate process of interpreting various data sets gathered during the course of this study. Each subsection navigates through distinct facets of data analysis, aiming to derive meaningful insights into the effectiveness of the implementation of the flipped classroom. The chapter begins with an exploration of personality test results, followed by interpretations of pre-test and post-test engagement inventories for both the control and experimental groups. Furthermore, it scrutinizes the comparison between pre-test and post-test results, discerning changes in engagement levels among participants.

A detailed examination of students' questionnaires and teachers' interviews sheds light on nuanced perspectives and experiences within the educational setting. Subsequently, the chapter progresses to a comprehensive discussion of the findings, juxtaposing them with existing research to discern patterns, deviations, and potential implications. Moreover, it delineates research limitations encountered during the study, acknowledging constraints that may have influenced the outcomes. The chapter culminates in an exploration of pedagogical implications, wherein the implications of the findings on educational practices and methodologies are scrutinized.

6.1. Personality Test Results Interpretation

The provided results show the distribution of students in both the experimental group and the control group based on their personality types, specifically classifying them as either introverted or extroverted. The experimental group consists of 54 students, while the control group consists of 57 students. This indicates that the sample sizes in both groups are relatively balanced, which is important for conducting a meaningful comparison between the two groups.

In the experimental group, 30 students (55.56% of the total) are classified as introverted, while 24 students (44.44% of the total) are classified as extroverted. This means that there are

slightly more introverted students in the experimental group compared to extroverted ones. Similarly, in the control group, 31 students (54.39% of the total) are classified as introverted, while 26 students (45.61% of the total) are classified as extroverted. Here again, introverted students are slightly more prevalent than extroverted students. It is worth noting that the distribution of personality types is relatively similar between the experimental group and the control group. Both groups have a slightly higher percentage of introverted students compared to extroverted students. The difference in the distribution of personality types between the two groups is not substantial.

6.2. Pre-test Engagement Inventory Interpretation

For the current study, it is essential to record the engagement levels and attitudes of the participants before the intervention to compare it to their engagement and attitudes after the intervention. Therefore, we start by interpreting the results of the pre-test for both the control and experimental groups.

6.2.1. Control Group

The analysis of the control group students' academic attitudes and behaviors in the pre-test phase indicates a generally positive disposition towards learning. Students tend to pay close attention in class, follow university rules, and meet assignment deadlines. However, their engagement in asking questions and participating in debates varies. Students display moderate interest in assignments, finding the classroom interesting, and integrating knowledge into problem-solving, with some variability in these behaviors. In addition, the three-dimensional analysis shows that students exhibit the highest level of engagement in behavioral aspects, indicating active involvement in class-related activities. Emotional engagement is slightly lower, with students expressing mixed feelings about their accomplishments at the university. However, cognitive

engagement is relatively high, suggesting students are actively integrating knowledge into their general understanding.

Furthermore, the gender-based differences analysis reveals that female students demonstrated notably higher levels of attentiveness in class, greater commitment to adhering to university rules, and a stronger tendency to complete homework on time compared to their male counterparts. These differences were statistically significant. However, in other aspects such as participation in classroom debates, involvement in group assignments, feelings of accomplishment, excitement about assignments, interest in doing assignments, finding the classroom interesting, and self-questioning while reading, there were no significant gender distinctions. A marginal preference for university life among female students was observed, but it did not reach statistical significance. In various areas like talking about learned topics with people outside the university, consulting dictionaries for unfamiliar words, integrating acquired knowledge, and combining subjects from different disciplines, no significant gender-based differences were identified. These findings shed light on gender-related variations in academic behaviors and can guide efforts to create inclusive educational environments.

Moreover, the results of this study offer insights into how different personality types, namely introverts and extroverts, influence various aspects of university behavior. Introverts showed a significantly higher inclination to pay attention in class, reflecting their preference for focused and quieter learning environments. On the other hand, extroverts had a marginally significant advantage in enjoying the university atmosphere, potentially due to their enjoyment of social interactions and group activities. Interestingly, introverts were more prone to discussing class topics outside the university, possibly favoring more intimate, one-on-one conversations. In contrast, Extroverts were more likely to seek help for word meanings, which aligns with their

communicative nature. However, both personality types exhibited similar behaviors in many other aspects, including following university rules, completing homework, and engaging in classroom debates. These findings highlight the multifaceted relationship between personality and academic behaviors, emphasizing the importance of tailoring educational approaches to individual differences.

Regarding the behavior and attitudes of introverted individuals in a university setting, on average, introverted respondents exhibit a moderate level of engagement, with a notable commitment to behavioral aspects, such as class attendance, rule adherence, and timely assignment completion. However, there is a mixed emotional engagement, as while they express some enthusiasm for assignments, feelings of accomplishment and a strong enjoyment for the university are comparatively lower. In terms of cognitive engagement, they actively question and problem-solve, indicating a proactive approach to learning. Nonetheless, there is room for improvement in encouraging discussions outside the university and fostering the integration of knowledge across disciplines. These findings offer guidance for creating a more well-rounded and fulfilling university experience for introverted students, focusing on enhancing emotional engagement and expanding their academic horizons.

6.2.2. Experimental Group

According to the analysis of the pre-test results of the experimental group, students exhibit positive engagement in key aspects like paying attention in class, adhering to university rules, and completing assignments punctually, though there are notable challenges in areas like feeling accomplished at the university, finding excitement in assignments, and enjoying their university experience. These aspects received lower mean scores, suggesting room for improvement to enhance students' satisfaction. Moreover, the data reveals a robust level of cognitive engagement,

reflecting proactive learning behaviors, including questioning, knowledge integration, and discussions beyond the university. Overall, the findings point to a balanced and moderate level of engagement across various dimensions, emphasizing the need for targeted strategies to address challenges and create a more fulfilling university experience for students.

Additionally, the results of the study largely reveal no significant gender disparities in students' responses, reflecting a consistent pattern of university experiences between males and females. However, several noteworthy exceptions deserve attention. Firstly, females demonstrate lower adherence to university rules, suggesting potential compliance issues among female students. Secondly, females express a lesser fondness for their university experience compared to males, emphasizing the importance of understanding the sources of these differing levels of satisfaction and well-being. Lastly, there is a significant gender difference in the integration of knowledge from various disciplines, with females displaying a lower inclination. This finding highlights the need to investigate and address factors contributing to these variations and to promote interdisciplinary learning among all students, ensuring a more equitable and enriching educational environment for both genders.

The analysis of responses from introverted and extroverted individuals within a university context reveals some distinctions influenced by personality types. While introverts tend to pay more attention in class, showcasing their preference for focused learning, Extroverts exhibit a slightly stronger inclination to follow university rules and excel in completing homework on time. Extroverts also display more engagement in debates, asking questions, and a generally more positive emotional connection to their academic experience. They express greater feelings of accomplishment, enthusiasm for assignments, and an enjoyment for being at the university. In contrast, introverts demonstrate a penchant for self-questioning during reading and integrating

knowledge across disciplines. Interestingly, introverts excel in integrating subjects from different disciplines into their general knowledge. These findings underscore the significant impact of personality types on university behaviors and highlight the importance of accommodating diverse learning preferences to create a more inclusive and effective educational environment.

Moreover, introverts demonstrate commendable levels of attentiveness in class, a strong commitment to following university rules, and a knack for timely homework completion, reflecting their responsibility and discipline. However, there is room for improvement in classroom discussions, as students express a lower inclination to actively engage in debates when they have doubts. Their sentiments regarding university life are mixed, with moderate levels of excitement about assignments and somewhat less feeling of accomplishment. Within the dimensions of engagement, behavioral engagement stands out, signifying active participation in academic activities. Cognitive engagement is also robust, indicating proactive learning and knowledge integration. However, emotional engagement appears somewhat lower, highlighting the need to enhance emotional well-being and satisfaction levels. The overall moderate level of engagement suggests that there is potential for improvement, particularly in emotional engagement, to create a more well-rounded and positive university experience for introverted students.

6.3. Post-test Engagement Inventory Interpretation

In this section, we interpret the data collected after the intervention to see how well the flipped classroom instructional method worked in keeping students engaged. By analyzing the post-test results from both the control and experimental groups, we aim to figure out the effectiveness of this approach in boosting student engagement levels.

6.3.1. Control Group

The data analysis of the post-test regarding the control group reveals insights into the variability and central tendencies of the data, indicating varying levels of agreement or engagement among students. Cognitive engagement emerged as the strongest dimension showcasing active involvement in activities like questioning and knowledge integration. Behavioral engagement followed closely reflecting commitment to behaviors such as attentiveness and rule adherence. In contrast, emotional engagement had a lower level indicating a comparatively lower level of emotional attachment to the university environment.

Furthermore, the results of the t-test comparing responses between males and females offer insights into gender-based differences in university behavior. Notably, females demonstrate a stronger tendency to complete their homework on time, highlighting their disciplined approach to meeting assignment deadlines. Surprisingly, there are no statistically significant gender disparities in other crucial aspects, including attentiveness in class, adherence to university rules, active participation in assignments, and feelings of accomplishment at the university. These findings suggest that, within the context of the surveyed behaviors, both male and female students exhibit similar attitudes and engagement in their academic pursuits.

Moreover, the comparative analysis of introverts and extroverts in the realm of academic behaviors and attitudes unveils several noteworthy distinctions between these personality types. Extroverts stand out with a significantly higher level of enthusiasm for assignments, reflecting their more eager and motivated approach to academic tasks. Besides, extroverts exhibit a proclivity for questioning themselves during reading, showcasing a deeper engagement with the learning process. Their tendency to seek assistance when encountering unfamiliar words underscores their sociable and communicative nature. However, it is crucial to note that no significant differences emerge

between introverts and extroverts in multiple other aspects of their academic lives, including classroom attentiveness, rule adherence, homework completion, and feelings of accomplishment. These results underscore the influence of personality traits on specific academic behaviors and suggest the potential for tailored educational strategies to accommodate diverse learning styles and preferences.

6.3.2. Experimental Group

For the experimental group of this study, the provided results indicate a range of engagement levels among respondents. On average, respondents exhibit moderate to high levels of agreement or engagement, with diverse responses across the statements. Some statements, such as doing homework on time, receive higher mean scores, suggesting positive attitudes or behaviors. Conversely, statements like talking to people outside the university receive lower mean scores, suggesting lower levels of engagement. Higher standard deviations in certain statements indicate a wider range of responses and greater variability. The study further categorizes engagement into three dimensions: behavioral engagement, emotional engagement, and cognitive engagement. On average, respondents demonstrate good behavioral and cognitive engagement, while emotional engagement shows some mixed feelings.

Furthermore, the provided results highlight significant gender-based differences in students' attitudes and behaviors. Females exhibit higher engagement in specific activities, such as reading comprehension and proactive problem-solving when encountering unfamiliar words, as indicated by their significantly higher mean scores compared to males. This suggests that females are more inclined to question themselves and ensure a deep understanding of the subject matter when reading. They also appear to be more excited about having assignments and express a stronger preference for being at the university.

In contrast, males display a higher level of active engagement in asking questions and participating in debates in the classroom, indicating that they are more willing to seek clarification when they have doubts. It is important to recognize that for several inventory items, including following university rules, completing homework on time, and talking to people outside the university about class matters, there are either no significant gender differences or only marginal variations. This implies that, for the most part, gender does not appear to have a significant impact on how respondents rate various aspects of their academic experiences.

However, the t-test results reveal a notable finding in Item 13, indicating a significant gender difference in problem-solving strategies when encountering unfamiliar words. This suggests that males and females employ distinct cognitive processes and learning strategies in this specific context. Overall, these findings emphasize the importance of recognizing and considering gender-based differences in academic behaviors and attitudes, particularly in situations where these differences may influence learning outcomes and strategies.

Besides, the presented results offer an analysis of data categorized by personality type, specifically introverts and extroverts, shedding light on how these personality traits can influence academic behaviors and preferences. Notable patterns emerge, revealing distinctive tendencies among introverted and extroverted students.

In terms of "Participating actively in group assignments," extroverts consistently display a significantly higher mean score compared to introverts, indicating their greater inclination for active participation and collaboration in group work. This suggests that extroverted students are more likely to engage actively in group projects and discussions within an academic setting.

Similarly, the survey item "Liking being at the university" reflects extroverts' stronger affinity for the university environment, as demonstrated by their higher mean score. This suggests

that extroverted individuals tend to feel more at ease and engaged in the university environment, possibly due to their outgoing and social nature. Similarly, in the aspect of "Asking questions and participating in debates in the classroom," extroverts score higher, indicating their higher propensity to engage in classroom discussions. It is noteworthy that there is also higher variability among introverts in this regard, suggesting that some introverted students may actively participate in classroom debates while others may not.

The results of independent samples t-tests further highlight these distinctions between introverted and extroverted students. In several aspects, there are no statistically significant differences between the two groups, indicating that personality type does not significantly impact behaviors such as paying attention in class, following university rules, completing homework on time, and engaging in activities like questioning oneself while reading or integrating acquired knowledge into problem-solving.

However, significant differences emerge in specific areas. Extroverted students exhibit significantly higher levels of active participation in group assignments, indicating their willingness to collaborate and engage in teamwork, a skill that is often valued in educational and professional settings. Furthermore, extroverts are more likely to engage in discussions outside the university about class topics, showcasing their extroverted nature by seeking out external interactions for learning and discussion. Extroverts also express a stronger preference for being at the university, suggesting a higher degree of comfort and satisfaction with the academic environment.

These findings emphasize the nuanced differences in academic engagement between introverted and extroverted students, highlighting areas where extroverts tend to be more active, expressive, and socially oriented in their learning experiences.

Moreover, on the whole, introverted students exhibit a positive disposition towards their academic responsibilities, with notably high mean scores for behaviors such as paying attention in class, following university rules, and completing homework on time, suggesting a conscientious approach to their studies. However, the presence of standard deviations with scores ranging from 3 to 5 implies variability in individual study habits and approaches. Contrasting this diligence, students appear less inclined to actively participate in class discussions and group assignments, with a wider range of responses influenced by factors like class size and university environment. While students generally enjoy being at the university and find their classrooms interesting, there is a wide spectrum of experiences, reflecting diverse perceptions of the academic environment. Feelings of accomplishment at the university are mixed, indicating that not all students feel entirely fulfilled in their academic journey. Notably, students actively seek assistance in understanding word meanings and effectively integrate acquired knowledge into problem-solving, showing a more consistent approach in these areas. In the analysis of engagement dimensions, students exhibit a relatively high level of behavioral engagement, with a strong commitment to classroom behaviors. Emotional engagement is more varied, suggesting room for improvement in this aspect, while cognitive engagement indicates a strong commitment to intellectual pursuits, with diverse attitudes and behaviors in the academic context.

6.4. Interpreting the Comparison of Pre-test and Post-test Results

The following represents an interpretation of the comparative assessment between the post-test results and the pre-test results of both the experimental and control groups.

6.4.1. Control Group

By comparing the results of the pre- and post-test of the control group, we track the changes in engagement levels of the control group across various dimensions after a specified period

(twelve weeks). It is important to note that these changes occurred without any specific intervention, offering insights into the natural evolution of student engagement over a period of time.

The overall findings show a decrease in engagement from the pre-test to the post-test, as reflected in the lower overall post-test mean score compared to the pre-test mean. Notably, two items, "I follow the university's rules" and "I am interested in doing assignments," displayed the most substantial decrease. This suggests that there has been a substantial reduction in engagement related to adhering to the university's rules and students' interest in completing assignments. This can be attributed to a combination of factors such as potential burnout, perceived lack of relevance, personal issues, teaching methods, communication gaps, shifting priorities, and external influences.

Conversely, there was a slight improvement in engagement in "participating actively in group assignments," as indicated by a small increase in the mean score (0.04). This finding suggests that students became slightly more engaged in group assignments over the course of the study. However, other items, such as those related to asking questions, participating in debates in the classroom, and questioning oneself while reading, displayed more considerable declines in engagement. This indicates significant decreases in these specific aspects of engagement. The substantial declines in student engagement in items related to classroom questions, debates, and critical reading self-reflection may result from factors such as classroom environment, teaching styles that discourage participation, student confidence issues, cultural influences, digital distractions, perceived curriculum irrelevance, and varying levels of motivation.

Furthermore, items measuring students' feelings of excitement about assignments, enjoyment for being at the university, and perception of the classroom's interest all exhibited

decreases in mean scores, indicating reduced engagement in these areas that may be due to factors such as monotony, course content misalignment with their interests, ineffective teaching methods, external stressors, burnout, and social influences.

Furthermore, from a three-dimensional perspective, behavioral engagement saw a significant decrease in the post-test, signifying a reduction in students' observable engagement behaviors. This decline could be attributed to changes in teaching methods, increased distractions, or external factors affecting student commitment. Emotional engagement also experienced a substantial decline, indicating students had fewer positive emotional experiences related to their educational activities. Potential reasons for this decline include a lack of connection to the material or increased stress. In contrast, Cognitive Engagement displayed a very minor increase, suggesting students' intellectual involvement remained relatively stable.

Generally, while there were some minor improvements in engagement in group assignments, other aspects, particularly adherence to university rules and interest in assignments, saw more significant declines. These findings highlight the dynamic nature of student engagement and the need for interventions or strategies to maintain or enhance student motivation and involvement in the academic context.

Dealing with only introverted students as a focus group, the results highlight significant changes in student engagement across several dimensions, revealing various patterns. In terms of overall engagement, there was a notable drop from the pre-test mean compared to the post-test, indicating a decrease in students' engagement levels. Two specific items, "excitement about assignments" and "interest in doing assignments," exhibited substantial declines, with mean scores dropping significantly. These declines suggest a marked decrease in students' enthusiasm for and

interest in assignments, possibly due to factors like monotonous course content or changes in their academic experience.

Furthermore, in the view of the three key dimensions of engagement, behavioral engagement displayed a significant reduction, signifying a decrease in observable engagement behaviors, which may be attributed to changes in teaching methods or student motivation. Emotional engagement exhibited a substantial drop, indicating a decline in students' emotional engagement. This could be due to increased stress or lack of connection to the material or method of teaching. Conversely, cognitive engagement saw a minor increase, suggesting that students' intellectual involvement remained relatively stable.

6.4.2. Experimental Group

The results reveal a dynamic landscape of changes in student engagement within the experimental group after the implementation of the flipped classroom instructional model. Various items exhibited noteworthy shifts, suggesting the influence of this innovative approach. The overall increase in the mean engagement score from the pre-test to the post-test underscores the positive impact of the flipped classroom intervention on students' overall engagement levels. Several factors can be attributed to these results. The enhanced attentiveness (Item 1) and the stronger commitment to following university rules (Item 2) may indicate that the flipped classroom structure promoted a more engaging and structured learning environment. The increased engagement in completing homework on time (Item 3) and the heightened excitement about assignments (Item 7) are likely reflective of the intervention's success in providing more relevant and motivating academic tasks. However, some minor decreases in engagement, such as students' participation in asking questions and debates (Item 4) or group assignments (Item 5), may result from individual variations or adjustments to teaching methods within the flipped classroom

framework. The increased affinity for the university environment (Item 8) and heightened interest in assignments (Item 9) likely stem from the intervention's positive influence on the overall campus experience. Enhanced engagement during reading (Item 11) and proactive efforts in understanding word meanings (Item 13) indicate improved learning strategies within the flipped classroom model. While there were minor declines in certain aspects, such as engaging with external individuals (Item 12) and applying acquired knowledge (Item 14), these changes may be attributed to various external factors or the specific content covered during the intervention. Overall, the data underscores the multi-dimensional nature of student engagement and highlights the potential benefits of the flipped classroom instructional model in positively impacting various facets of students' involvement and enthusiasm in the educational process.

In the same vein, across the three dimensions of engagement, notable improvements were observed after the intervention. Behavioral engagement displayed an increase, reflecting a higher level of active participation and conduct among students. Emotional engagement saw notable growth, indicating that students became more enthusiastic and emotionally connected to their educational experience. Additionally, cognitive engagement improved, with students demonstrating enhanced critical thinking and a deeper understanding of the material. The success of the flipped classroom model may be attributed to its interactive and student-centered nature, allowing for more active involvement, personalized learning, and a deeper emotional connection to the content. These findings suggest that the flipped classroom can effectively enhance various facets of student engagement and create a more engaging and interactive learning environment.

Considering gender differences, the t-test analysis conducted on various aspects of academic experiences among respondents suggests that, for the majority of items, there are no significant differences in mean scores between males and females. This indicates that gender does

not play a significant role in how individuals rate their academic experiences across several dimensions, such as class participation, adherence to rules, and completion of assignments. However, a noteworthy finding emerges in Item 13, revealing a significant gender difference in problem-solving strategies related to unfamiliar words. This underscores the importance of considering gender-based differences in specific cognitive processes and learning strategies. Overall, while most aspects of academic experiences appear gender-neutral, understanding gender differences in certain cognitive functions can inform more inclusive educational practices.

Moreover, focusing on introverted students, the results following the implementation of the flipped classroom instructional model show significant changes in introverted students' engagement levels. Several items displayed increased post-test mean scores, indicating improvements in various aspects of engagement. Notably, students exhibited increased attentiveness (Item 1) and a stronger commitment to following university rules (Item 2), suggesting that the flipped classroom structure may have encouraged a more focused and rule-abiding learning environment. Substantial improvements in on-time completion of homework (Item 3) and increased excitement about assignments (Item 7) may be attributed to the intervention's ability to make homework more manageable and assignments more stimulating. Some items experienced minor declines in engagement, which could be due to individual variations or adjustments within the flipped classroom. Moreover, proactive efforts in understanding word meanings (Item 13) and applying acquired knowledge (Item 14) increased, indicating a more active approach to learning. These findings suggest that the flipped classroom instructional model positively impacts various facets of student engagement, creating a more interactive and dynamic learning environment. Additionally, the three dimensions of engagement, including behavioral, emotional, and cognitive

engagement, all demonstrated growth, further emphasizing the model's effectiveness in enhancing overall student involvement and commitment to the learning process.

6.5. Students' Questionnaire Interpretation

According to the students' questionnaire that was administered post-experiment to the experimental group, the results reveal several noteworthy findings about the experimental group's responses to the flipped classroom instructional model. The majority of students, constituting about 75.9%, are female, while males make up approximately 24.1% of the group. Regarding their perceptions of the model, students highly agree on the effectiveness of course materials, indicating that they find them beneficial for their learning journey. A substantial percentage also reports having a substantial learning experience, emphasizing the positive impact of the flipped classroom approach. Students acknowledge the importance of effort in the course and strong communication with both peers and the instructor, highlighting the collaborative and interactive nature of the model. The fact that out-of-class experiences are applied to practical applications suggests that students see the relevance of what they learn. The availability of technical support and resources is seen as advantageous, while a significant portion of students expressed interest in taking a similar course in the future, underlining their positive experience. However, some students indicated the need for technical assistance and improved access to online course materials; this highlights the importance of ensuring that students have easy access to the necessary resources.

Additionally, on a positive note, enhanced communication tools like Facebook, email, and online discussions are valued by students, emphasizing the role of technology in promoting interaction and collaboration. Moreover, in-class group discussions are highly favored by the majority of students, underscoring the importance of interactive and collaborative learning experiences. Students' responses also indicate a strong preference for mobile devices for their

educational needs, highlighting the significance of mobile-friendly resources and platforms. Overall, these results suggest that the flipped classroom model has had a positive impact on communication and collaboration but also underscores the importance of ensuring easy access to online materials for all students. The results also reflect the students' adaptability to various technology tools, emphasizing the importance of creating a technology-rich learning environment that caters to their preferences and needs.

Furthermore, it is evident that the flipped classroom approach has garnered significant support from the students, with an overwhelming 96.3% expressing a positive perception of its impact on their participation and engagement in learning. This consensus suggests that the flipped classroom is effective in fostering student engagement, regardless of their introverted or extroverted tendencies. The method's pre-preparation component appears to empower students, boost their confidence, and facilitate active participation in class discussions and activities. Introverted students, in particular, highlight a transformation in their willingness to participate, indicating that the flipped classroom can create a more inclusive and engaging learning environment.

In terms of enjoyment, nearly 94.4% of students reported either high enjoyment or moderate enjoyment of the flipped classroom approach. Only a small fraction (5.6%) indicated limited enjoyment. This suggests that the majority of students find the flipped classroom enjoyable, highlighting its appeal as a teaching method. The positive feedback on enjoyment aligns with the student's perception of increased engagement and participation, indicating that the approach not only enhances learning outcomes but also contributes to a more satisfying and enjoyable learning experience.

The impact of the flipped classroom on various aspects of student learning is also noteworthy. A significant majority of respondents reported improvements in class participation, group work, risk-taking, attention, focus, and interest in learning. These findings indicate that the flipped classroom model positively affects a wide range of student behaviors and attitudes. It encourages active participation, collaboration, and a willingness to take risks, ultimately leading to enhanced engagement and motivation. Moreover, the approach's impact on active learning, student-centered learning, critical thinking, and reflective practice underlines its effectiveness in promoting higher-order thinking skills and self-directed learning. However, the smaller percentages of students noting improvements in knowledge retention and grasping learning materials suggest that there may be variations in how individual students respond to the flipped classroom's pedagogical approach. Overall, the data reinforces the effectiveness of the flipped classroom in improving both student engagement and the quality of their learning experiences.

Finally, the feedback provided by the experimental group following the intervention of using the flipped classroom as an instructional model indicates a highly positive response to this pedagogical approach. Students' comments highlight the benefits of increased engagement, motivation, and improved confidence in their class participation and presentations. They appreciate the clarity, enjoyability, and structure of the flipped classroom, as well as its positive impact on skills like critical thinking and collaboration. Importantly, the method is credited with promoting equal opportunities for all students to participate and reducing the fear of making mistakes, creating an inclusive and supportive learning environment. The fact that students, whether introverted or extroverted, find the approach suitable underscores its adaptability and effectiveness for a diverse range of learners. Additionally, the suggestion to integrate theater elements for added fun and motivation reflects a creative approach to further enhance the flipped classroom experience. The

feedback strongly affirms the flipped classroom's efficacy in fostering active participation, encouraging question-asking and debates, and providing a comfortable and motivating atmosphere for learning.

6.6. Teachers' Interview Interpretation

The results of the teachers' interviews regarding the use of the flipped classroom as an instructional model highlight several key insights. Firstly, the teachers' diverse educational qualifications and areas of expertise demonstrate a rich pool of knowledge and experience among them. This diversity could contribute to a more comprehensive and adaptable use of the flipped classroom, catering to various subjects and learners in the EFL context. Secondly, the duration for which these teachers have implemented the flipped classroom is notable. Some teachers have been using it for several years, even before fully understanding the concept, highlighting their dedication to this approach. This extensive experience likely plays a role in their ability to effectively implement and adapt to the model. Regarding the modules taught using the flipped classroom, it is evident that teachers have applied this approach to various subjects, indicating its versatility and adaptability to different learning areas. This adaptability is crucial in making the flipped classroom a viable instructional model for a wide range of courses.

In terms of differences between conventional teaching and the flipped classroom, the teachers note the initial challenges of transitioning to the flipped model, primarily related to the use of technology. However, they emphasize that the flipped classroom fosters learner-centered teaching, encourages increased class interaction, and offers students the flexibility to work at their own pace. This shift from passive learning to active engagement is seen as a fundamental benefit. The advantages of the flipped classroom identified by the teachers align with its pedagogical principles. They highlight that it allows students to access a wide range of materials, promotes

independent learning, and offers a more engaging and interactive learning experience. The flexibility and individualization it provides can cater to various learning styles. The consideration of learners' differences, particularly for introverted and extroverted students, is evident. The flipped classroom is perceived as a valuable tool for accommodating both personality types, offering a comfortable and supportive learning environment for all students. It empowers introverts to participate more actively and extroverts to engage with the content at their own pace.

Pre-class preparation, a crucial aspect of the flipped classroom, is found to be generally successful, with students completing assignments before class, indicating their readiness and engagement. This pre-class preparation contributes to the active and participatory nature of in-class activities. The students' satisfaction with the flipped classroom seems generally positive. While there may be initial hesitations or preferences for traditional teaching methods, students tend to enjoy the flipped model once they become accustomed to it. However, there are considerations for the implementation, and some students may prefer traditional teaching methods they are more familiar with. Lastly, the teachers recommend the use of the flipped classroom to enhance students' engagement, but they also emphasize the importance of teacher training and a well-structured plan for successful implementation. Despite the challenges, they see the flipped classroom as a valuable approach for promoting student engagement and learning. In conclusion, the teachers' interview provides valuable insights into the use of the flipped classroom as an instructional model. Their experiences and perspectives emphasize the adaptability, benefits, and challenges of this approach, ultimately pointing to its potential as an effective means of enhancing student engagement and learning.

6.7. Discussion of the Findings

In order to answer the research questions of this study it is necessary to corroborate the quantitative data obtained from the USEI and the students' questionnaire with the qualitative data gathered from the semi-structured interviews conducted with teachers.

a) What kind of relationship exists between the engagement of third-year introverted EFL students at the English Department of Guelma University and the flipped classroom model?

To answer the first research question, we observe the results that indicate that the flipped classroom model positively impacts introverted EFL students' engagement across multiple dimensions (behavioral, emotional, and cognitive). Specific aspects of engagement, such as attentiveness, commitment to following rules, completing assignments punctually, and demonstrating excitement about learning tasks, showed considerable improvements post-flipped classroom implementation. These enhancements suggest that the flipped classroom structure creates an environment that aligns well with introverted students' learning preferences. The structured and stimulating nature of the flipped classroom might resonate with introverted personalities, fostering a more focused and participatory atmosphere.

In addition, introverted students might feel hesitant in traditional classroom settings due to their inclination towards solitary activities or a preference for processing information internally. The pre-preparation aspect of the flipped classroom empowers introverted students by allowing them to engage with the material beforehand, which could reduce their anxiety about participating in class discussions or group activities. This sense of preparation might lead to increased participation and confidence among introverted students, contributing to their overall engagement.

b) To what extent can elements of the flipped classroom model help enhance introverted EFL students' engagement through the case study of third-year students at the English Department of Guelma University?

For the second research question, the results convey that flipping the classroom seems to significantly enhance engagement levels among introverted EFL students. The model provides a more inclusive and comfortable learning environment, allowing introverted students to engage actively and comfortably in classroom interactions. The opportunity for pre-class preparation enables them to absorb content at their own pace, potentially leading to a deeper understanding and confidence when participating in discussions or collaborative activities during class sessions.

The flipped classroom also encourages proactive learning strategies, such as understanding word meanings, applying acquired knowledge, and engaging in independent study. For introverted students who might prefer self-paced and solitary learning, this approach appears to cater to their learning style, promoting active participation and deeper involvement in the learning process. Moreover, improvements were evident in all three dimensions of engagement following the intervention. There was a rise in behavioral engagement, showcasing increased active involvement and behavior among students. Emotional engagement displayed considerable growth, suggesting heightened enthusiasm and stronger emotional attachment to their learning. Additionally, cognitive engagement showed enhancement, as students exhibited improved critical thinking skills and a deeper grasp of the subject matter.

c) How do third-year introverted EFL students at the English Department of Guelma University experience and perceive inverted classes?

For the sake of answering the last research question, the interpretation of the results asserts that introverted EFL students experience a supportive and inclusive learning environment in the

flipped classroom. The structure of the model, with its emphasis on pre-class preparation, seems to reduce the pressure of immediate participation, allowing introverted students to contribute meaningfully during in-class activities. This reduced anxiety leads to a more positive perception of their learning experience.

Furthermore, the flipped classroom's emphasis on active learning and pre-preparation fosters an environment where introverted students feel more comfortable participating in discussions or group activities. By having time to process information beforehand, introverted students may find themselves more prepared and confident in contributing to class activities, leading to a positive perception of their ability to engage with the material and their peers.

6.7.1. Comparing the Study Findings with Previous Studies

In analyzing and comparing the findings of the studies related to the flipped classroom, EFL students' engagement, and introversion and extroversion personality types, several common themes and insights emerge. The research findings suggest a consistent and favorable correlation between the flipped classroom approach and heightened engagement among students.

Noprianto's (2017) study about learning strategy differences supports the findings that introverted students tend to use memory strategies, which might align with the pre-preparation aspect of the flipped classroom, benefiting their engagement. In addition, Chew and Ng's (2021) study on word contributions in different settings revealed that introverts tend to contribute more in online environments, a finding that mirrors the increased participation and comfort observed in the flipped classroom, where students have the opportunity for pre-class preparation and asynchronous interaction. Furthermore, Almusharraf and Almusharraf (2021) explore in their study about online writing and social presence how instructors can control the learning environment to suit introverts' and extroverts' needs, echoing the importance of classroom design and facilitation in enhancing

engagement. In the same vein, flipped classroom instruction fits these criteria catering to introverts' and extroverts' needs.

Moreover, while studying the effect of implementing the mind mapping technique on EFL learners' speaking skills in both conventional and flipped classes, Khodabandeh (2021) discovered that flipped classes benefit introverted students more than extroverted students in speaking skills, echoing the positive impact observed in the current flipped classroom studies on enhancing introverted EFL students' engagement. Similarly, Li and Li's (2022) mixed-methods approach study aligns with the findings that flipped classes improve cognitive and behavioral engagement but also highlights the importance of addressing the challenging aspects of implementing the flipped classroom. Notably, Ibrahim and Alahmed's (2023) quasi-experimental study affirms the positive impact of flipped classrooms on engagement among EFL students, supporting the results of the current research.

Furthermore, studies by Yan and Lv (2024) and Majed and Alwadi (2024) also explore engagement dimensions in the context of the flipped classroom. Yan and Lv develop a comprehensive engagement scale covering cognitive, emotional (both peer and teacher relationships), and behavioral aspects. Majed and Alwadi focus on student engagement in mathematics classrooms, observing improvements resulting from flipped classroom pre-class assignments.

Across the studies, there is a consensus on the positive impact of the flipped classroom model on student engagement. The flipped model fosters active learning, personalized experiences, and pre-class preparation, which contribute to enhanced engagement levels. Khatoon et al. (2024) discuss the positive impact of technology integration on student engagement and language

acquisition, reinforcing the notion that innovative teaching methods, including the flipped classroom, can positively influence engagement.

Various methodological approaches are employed across the studies to investigate the impact of the flipped classroom model on student engagement. These include mixed-method designs, surveys, interviews, and pre/post-test assessments. While some studies focus on specific subject areas like mathematics (Majed & Alwadi, 2024) and English language teaching (Khatoun et al., 2024), others explore broader aspects of student engagement and learning outcomes.

Similar to our study, Ramadoni (2023) delves into the influence of extroverted and introverted personalities on conceptual understanding in the flipped classroom, highlighting the importance of considering individual differences in teaching methodologies. Whereas, Birova et al. (2023) focus on the implementation of the flipped classroom model in EFL instruction with pre-service teachers, providing insights into grammar accuracy and listening skills. The study emphasizes the contextual relevance of instructional methods in different educational settings.

While there are variations in the methodologies and contexts across the studies, they collectively highlight the efficacy of the flipped classroom model in enhancing student engagement and learning outcomes. Collectively, these studies and the primary research resonate in indicating that the flipped classroom's structured and preparatory nature creates an environment that suits introverted learners' inclinations. It diminishes anxiety, encourages active participation, and aligns with their learning preferences, contributing positively to their overall engagement and academic performance. The evidence from various studies also strengthens the understanding that the flipped classroom model significantly benefits not only introverted but also extroverted EFL learners, providing a supportive and inclusive environment conducive to their enhanced engagement and learning experience.

6.8. Research Limitations

During the study, certain unavoidable difficulties arose, notably the division of the research sample into introverted and extroverted individuals, resulting in a smaller focus group (introverts). To address this challenge, the researcher implemented strategies to involve four distinct administrative-set groups in the research, aiming to maximize participant recruitment.

Finding a sample of EFL teachers who have implemented the flipped classroom instructional model in Algeria proved challenging due to the limited prevalence of teachers utilizing this instructional model within the country. Therefore, EFL teachers should receive more professional development workshops and training focusing on the use of different methods of teaching and educational technology in higher education.

Further research can be implemented to study engagement levels over longer durations of intervention after prolonged exposure to the flipped classroom model. In addition, further research can also cover other dimensions or factors influencing students' engagement (e.g., social interaction, motivation, learning environment).

6.9. Pedagogical Implications

The pedagogical implications drawn from the study's findings on the relationship between the flipped classroom model and introverted EFL students' engagement can influence teaching practices in the following ways.

Educators could consider incorporating elements of the flipped classroom model into their teaching strategies to better accommodate introverted students. By providing materials for pre-class preparation and fostering an environment that allows students to engage at their own pace, instructors can support introverted learners who prefer solitary learning and internal information processing.

Moreover, emphasis should be placed on creating inclusive learning environments that cater to various learning preferences. The findings suggest that the flipped classroom model promotes a more inclusive atmosphere for both introverted and extroverted students, enabling them to participate comfortably in discussions and collaborative activities without the immediate pressure to engage.

Furthermore, encouraging proactive learning strategies for introverted EFL students involves fostering independent study opportunities, reinforcing word meanings through engaging exercises, promoting the application of acquired knowledge in practical contexts, and providing self-paced learning resources. Educators can support these strategies by facilitating reflective practices, offering varied learning materials, and creating comfortable spaces for introverted learners to engage in discussions at their own pace. Integrating these approaches into lesson plans aims to empower introverted students, allowing them to delve deeper into subjects, build confidence, and actively participate in their learning process while respecting their preferred learning styles and pace.

Additionally, educators should consider reducing anxiety and fostering confidence among introverted EFL students by creating a supportive learning environment through pre-class preparation opportunities. Offering materials or resources for students to review before class mitigates the pressure of immediate participation, granting introverted learners time to familiarize themselves with the content. This approach helps alleviate anxiety about contributing on the spot and enables introverted students to enter class discussions or activities feeling more prepared and self-assured. As a result, they are more likely to engage actively, share their thoughts, and participate meaningfully in classroom interactions, thereby gradually building their confidence in expressing ideas and contributing to the academic discourse. Such preparation time not only eases

the stress associated with immediate participation but also empowers introverted learners to engage more comfortably and confidently in the learning process.

The implementation of the flipped classroom model demonstrates significant potential in elevating engagement levels across diverse dimensions for introverted EFL students. By adopting elements of this model, educators can potentially foster comprehensive and enriched student engagement across multiple dimensions beyond conventional teaching approaches. This suggests that integrating aspects of the flipped classroom methodology into teaching practices holds promise in nurturing a more committed, enthusiastic, and cognitively involved learning experience for both introverted and extroverted students. Such an approach acknowledges and accommodates diverse learning preferences, providing opportunities for enhanced participation, deeper emotional connection to learning, and improved critical thinking skills, thereby contributing to more effective and inclusive educational practices.

Besides, understanding the learning preferences of introverted students, such as their inclination toward structured and self-paced learning, can inform lesson planning. Incorporating activities that accommodate these preferences can enhance their learning experience and overall engagement. Hence, adopting elements of the flipped classroom model in educational settings could play a pivotal role in transforming introverted learners' attitudes toward their academic experiences. By implementing this approach, educators have the potential to create a more favorable and supportive learning environment for introverted students, fostering a shift towards a more positive outlook on engaging with course material and collaborating with peers. It can also contribute significantly to building students' confidence, interest, and sense of belonging in the learning process, particularly benefiting introverted learners.

The positive impact observed in introverted EFL students' perception of learning through the flipped classroom model presents a pivotal pedagogical implication. This outcome signifies the potential of this approach to transform the attitudes and viewpoints of introverted learners in their educational journey. By fostering a supportive and inclusive atmosphere, the flipped classroom method appears to mitigate anxieties and cultivate a more optimistic perspective among introverted students concerning their involvement with course material and peer interactions. This favorable change in perception could result in bolstered self-assurance, a deeper interest in learning, and a heightened sense of belonging within the academic realm. Thus, embracing the flipped classroom methodology stands as a pedagogical tool that not only augments academic engagement but also cultivates students' overall contentment and eagerness in their educational experiences, especially benefiting introverted learners.

In summary, the findings of this study suggest that the flipped classroom model has several advantages for engaging introverted EFL students. Educators can leverage these insights to create more inclusive, supportive, and engaging learning environments that accommodate the diverse needs and preferences of all students, including introverted learners.

Conclusion

In conclusion, the study presents valuable insights into the nuanced dynamics between the flipped classroom model and the engagement levels exhibited by introverted EFL students. Through an examination of the data, the analysis reveals multifaceted dimensions where the flipped classroom positively influences engagement, spanning behavioral, emotional, and cognitive domains. Of particular significance is the discernible advantage observed among introverted students who thrive within the structured and preparatory framework of the flipped classroom environment, leading to notable reductions in anxiety levels and heightened participation in

learning activities. This finding underscores the potential of the flipped classroom model to cater to the unique needs of introverted learners, thus facilitating their active engagement and fostering a conducive learning atmosphere. Furthermore, the juxtaposition of these findings with existing literature underscores the consistent and favorable association between the flipped classroom approach and elevated levels of engagement among EFL learners. This collective body of evidence not only reaffirms the pedagogical efficacy of the flipped classroom but also highlights its capacity to create an inclusive learning environment that accommodates the diverse learning styles and preferences of both introverted and extroverted students. In essence, the flipped classroom emerges as a promising educational strategy poised to enhance the overall engagement and learning outcomes of EFL students, thereby contributing to the continuous evolution of pedagogical practices in language education.

GENERAL CONCLUSION

The journey undertaken in this thesis has traversed the evolving landscape of contemporary education, engaging with the transformative potential inherent within the flipped classroom instructional model. This exploration has delved into the fundamental shifts occurring within educational paradigms, particularly emphasizing the role of innovative pedagogical approaches in reshaping traditional learning environments. Through a focused analysis of the flipped classroom model, the thesis has illuminated its capacity to foster student-centered learning experiences and promote active engagement with course content. By examining its historical evolution and practical application approaches, the thesis has emphasized the factors involved in embracing innovative methodologies.

In addition to exploring the flipped classroom model, the thesis has undertaken an examination of introversion and extroversion personality types within the context of language learning. Through an investigation of theoretical frameworks and empirical evidence, it has dissected the intricate interplay between these personality traits and language acquisition processes. By scrutinizing the different challenges and preferences of introverted and extroverted learners, this study has provided valuable insights into the design and implementation of tailored instructional strategies that cater to diverse learner profiles. Furthermore, our research has explored the implications of introversion and extroversion on classroom dynamics, highlighting the importance of fostering inclusive learning environments that accommodate the diverse needs of all

students. This exploration has contributed to a deeper understanding of the complex interactions between personality traits and educational outcomes, enriching the discourse surrounding effective teaching and learning practices.

At the heart of this exploration lies the flipped classroom model, a pedagogical innovation that represents a departure from traditional instructional paradigms. By overturning the conventional classroom dynamic, the flipped classroom empowers students to take an active role in their learning journey by engaging with course content outside of traditional class hours. This approach aims to deepen students' understanding of the material and foster critical thinking skills through self-directed learning experiences. The flipped classroom model has been shown to facilitate deeper learning experiences and promote student autonomy by providing opportunities for students to explore concepts at their own pace. Moreover, the flipped classroom's origins can be traced back to pioneering efforts at institutions such as the Massachusetts Institute of Technology, where early experiments in online learning paved the way for its widespread adoption in contemporary educational contexts.

Despite its potential benefits, the implementation of the flipped classroom is not without its challenges, as highlighted by the chapters in this thesis. Logistical, pedagogical, and technological considerations must be carefully addressed to ensure its effectiveness in diverse learning environments. Educators must navigate issues such as access to technology, student readiness for self-directed learning, and the design of engaging and interactive online materials. Moreover, the flipped classroom requires a fundamental shift in instructional practices, necessitating ongoing professional development and support for educators as they adapt to new teaching methodologies. Despite these challenges, the flipped classroom has emerged as a catalyst for pedagogical

innovation and student-centered learning, offering educators new opportunities to engage and inspire students in the pursuit of knowledge.

Complementing the exploration of instructional methodologies, this research delves into a detailed examination of introversion and extroversion personality types within EFL learning environments. Through a synthesis of theoretical analyses, empirical investigations, and pedagogical insights, the thesis offers an understanding of the profound influence of these personality traits on various aspects of language acquisition. Likewise, introversion and extroversion play a significant role in shaping not only individual learning preferences but also classroom dynamics and teaching strategies. By unraveling the complexities surrounding the interplay between personality traits and language learning processes, this study contributes to a deeper understanding of the multifaceted nature of EFL education.

Moreover, the thesis highlights the crucial significance of recognizing and accommodating the diverse learning preferences and communication styles exhibited by both introverted and extroverted learners within EFL contexts. This study emphasizes the imperative for educators to cultivate inclusive and supportive learning environments that optimize language acquisition outcomes for all students. This necessitates the adoption of a student-centered pedagogical approach that not only acknowledges but also respects the unique characteristics of each learner. By embracing such an approach, educators can cultivate an atmosphere of mutual respect and understanding wherein all students feel valued and empowered to actively participate in the language learning process. Through its thorough exploration of introversion and extroversion dynamics within EFL learning environments, this research furnishes important insights that intend to contribute to guiding the development of more effective and inclusive pedagogical practices within the realm of language education.

Furthermore, the thesis underscores the intrinsic value of fostering an environment wherein students' diverse learning preferences and communication styles are not only acknowledged but also accommodated with close attention paid to the pivotal role of educators in creating inclusive and supportive learning environments that cater to the needs of introverted and extroverted learners alike. By embracing a student-centered pedagogical ethos, educators can create a classroom atmosphere characterized by mutual respect and appreciation for the unique attributes of each learner. Such an environment empowers students to engage actively in the language learning process, thereby enhancing their overall learning outcomes.

Central to the discourse on effective teaching and learning lies the concept of student engagement, which serves as a cornerstone of educational theory and practice. This thesis adopts a comprehensive approach to conceptualizing engagement, recognizing it as a multifaceted construct that encompasses behavioral, emotional, and cognitive dimensions. Besides, the study explores the intricate interplay between student engagement and various instructional methodologies. Through a combination of empirical investigations and theoretical analyses, this research sheds light on the pathways to enhancing student engagement within educational contexts. By advocating for the integration of innovative instructional approaches and technological tools, we emphasize the importance of fostering active participation and intrinsic motivation among learners. Moreover, by synthesizing findings from empirical studies and theoretical frameworks, the thesis tends to contribute to a deeper understanding of the factors that influence student engagement and offers insights into strategies for promoting meaningful learning experiences.

Furthermore, our study underscores the importance of recognizing the dynamic nature of student engagement and its implications for instructional practice. By highlighting the role of technology in facilitating engagement and promoting learner autonomy, this study asserts the

significance of intrinsic motivation in driving student engagement. Through its exploration of innovative instructional approaches, this research elucidates the potential of technology-enhanced learning environments to foster student engagement across diverse educational settings. Integrating insights from empirical research and theoretical perspectives contributes to guiding educators seeking to enhance student engagement and promote meaningful learning experiences. Through its comprehensive analysis of the complex interplay between student engagement and instructional methodologies, the thesis contributes to the ongoing discourse surrounding effective teaching and learning practices, offering practical recommendations for educators and stakeholders in the field of education.

As the journey draws to a close, it becomes increasingly apparent that effective teaching and learning are far from static constructs but rather dynamic processes that continually evolve in response to changing pedagogical paradigms, technological advancements, and socio-cultural contexts. Embracing pedagogical innovations such as the flipped classroom model, educators are better equipped to adapt to the shifting educational landscape and meet the diverse needs of twenty-first-century learners. By flipping the traditional classroom dynamic, educators empower students to take ownership of their learning experiences, encouraging active engagement and critical thinking skills development both inside and outside the classroom environment.

Furthermore, the journey underscores the importance of recognizing the diverse needs and preferences of learners, particularly with regard to introverted and extroverted tendencies with close attention to introverted learners; as their personality types require further consideration to accommodate their needs and preferences in learning. Educators play a pivotal role in creating inclusive learning environments that honor and accommodate the unique characteristics of each learner to empower them to thrive and succeed in the modern knowledge economy. Moreover, by

fostering meaningful engagement among students, educators cultivate a culture of curiosity, collaboration, and lifelong learning, laying the foundation for academic excellence and personal growth.

In the final analysis, this thesis encapsulates a scholarly inquiry into contemporary educational practices embodying a call to action for educators, policymakers, and stakeholders to embrace innovation, promote inclusivity, and nurture a culture of lifelong learning within our progressively interconnected global society. Through the examination of pedagogical innovations, such as the flipped classroom model, and a nuanced exploration of diverse learning needs, this study underscores the imperative of fostering environments that are conducive to learning and growth for all learners, regardless of background or ability.

Moreover, by championing innovative teaching methodologies and embracing emerging technologies, educators can empower learners to navigate the complexities of the modern world with confidence and competence. Through a commitment to lifelong learning, educators can instill in students a passion for discovery, a thirst for knowledge, and a commitment to continual self-improvement. In conclusion, the journey highlights the transformative potential of pedagogical innovation, learner-centered approaches, and meaningful engagement in shaping the future of education and preparing learners for success in an ever-changing world. In this spirit of collective endeavor, may the findings and recommendations put forth in this thesis inspire meaningful dialogue, inform evidence-based practice, and catalyze transformative change within educational communities worldwide.

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APPENDICES

Appendix 1: University Student Engagement Inventory

General Information

Name:

Group:

Gender: Male Female

Personality type: Introvert Extrovert

Instructions: Using the response scale, indicate how often the following statements apply to you:

1 - I pay attention in class.

Never A few times Sometimes Most of the time Always

2 - I follow the school's rules.

Never A few times Sometimes Most of the time Always

3 - I usually do my homework on time.

Never A few times Sometimes Most of the time Always

4 - When I have doubts, I ask questions and participate in debates in the classroom.

Never A few times Sometimes Most of the time Always

5 - I usually participate actively in group assignments.

Never A few times Sometimes Most of the time Always

6 - I don't feel very accomplished at this school.

Never A few times Sometimes Most of the time Always

7 - I feel excited about the school work.

Never A few times Sometimes Most of the time Always

8 - I like being at school.

Never A few times Sometimes Most of the time Always

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9 - I am interested in school work.

Never A few times Sometimes Most of the time Always

10 - My classroom is an interesting place to be.

Never A few times Sometimes Most of the time Always

11 - When I read a book, I question myself to make sure I understand the subject I'm reading about.

Never A few times Sometimes Most of the time Always

12 - I talk to people outside the school on matters that I learned in class.

Never A few times Sometimes Most of the time Always

13 - If I do not understand the meaning of a word, I try to solve the problem, for example, by consulting a dictionary or asking someone else.

Never A few times Sometimes Most of the time Always

14 - I try to integrate the acquired knowledge in solving new problems.

Never A few times Sometimes Most of the time Always

15 - I try to integrate subjects from different disciplines into my general knowledge.

Never A few times Sometimes Most of the time Always

Appendix 2: Students' Perception of Instruction Questionnaire

Dear student,

This questionnaire is part of a study that aims at examining EFL learners' perception of the flipped classroom model³. Case study of third-year EFL students at the Department of English – 8 Mai 1945 University, Guelma.

You are kindly requested to answer the questions either by using a tick (√) in the appropriate box or making a full statement(s) whenever necessary. Responses will be kept confidential.

May I thank you in advance for your collaboration.

Amani BOUCHARB

Section One: General Information

1- Name:

Group:

2- Gender

Male

Female

3- Personality type

Introvert

Extrovert

³ A flipped classroom is a type of blended learning where students are introduced to content at home and practice working through it at school. This is the reverse of the more common practice of introducing new content at school, then assigning homework and projects to be completed at home.

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Section Two: Students' Perception

4- Indicate your level of (dis)agreement on the following statements by putting a (√) in the right column

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. During the oral session, I communicated a lot with other students.					
2. During the oral session, I talked with Ms. Bouchareb					
3. I had to work hard in this course.					
4. I learned a lot in this course.					
5. The assignments and projects I have worked on in this course deal with real life applications and information.					
6. The availability of course materials, communication, and assessment tools helped me improve my learning.					
7. I have applied my out-of-class experiences and learned from practical applications.					
8. I explored my own strategies for learning.					
9. I needed technical assistance for this class.					
10. Availability and access to technical support and resources helped me improve my learning.					
11. I would choose to take another course like this one.					
12. I like the routine in this class.					
13. I like the materials (videos, articles) provided in this course.					
14. The materials provided helped maintain my interest in the course					

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15. The use of videos enabled me to learn more effectively than lecture alone					
16. Watching the videos increased my in-class participation					

Section Three: Students' Preferences

5- Which of the following have helped you improve your learning experience? (you may pick more than one)

- a. Availability and access to online content and course materials
- b. Enhanced communication using Facebook, email, and online discussion
- c. Evaluation, feedback, and grading tools
- d. Ease of use of the Web environment
- e. In-class group discussion
- f. Group collaboration
- g. Working on the assignments and class work by myself

6- What other aspects of this course have helped improve your learning?

.....

.....

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7- What did you like most about the flipped classroom experience?

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.....

.....

8- Do you support the integration of educational technology in learning?

Yes No

9- Please explain your answer:

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.....

10- What technological device/s did you use during your learning?

Mobile

Tablet

Laptop

Desktop computer

Section Four: Students' Personality Awareness

11- As an introvert/extrovert, do you think the flipped classroom contributed to your participation and engagement in learning?

Yes

No

12- Please explain your answer:

.....
.....
.....

13- To what extent was the flipped classroom enjoyable to you?

To a great extent

To some extent

To a limited extent

Not at all

14- In which way do you think the flipped classroom improved your learning engagement?

a. Class participation

b. Asking questions

c. Group wok

d. Motivation

e. Risk taking

f. Overcoming fear of speaking

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g. Attention and focus

h. Interest in learning

Other:

15- As an introvert/extrovert which aspect do you think the flipped classroom improved for you most?

Active learning

Retention of knowledge

Critical thinking

Reflective practice

Grasping learning materials

Student-centered learning

Autonomy and life-long learning

Other:

Section five: Suggestions

16- If you have further information or suggestion you would like to add concerning the flipped classroom experience, or any other general comments about the course feel free to add it in the section below:

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Thank you!

Appendix 3: Teachers' Semi-Structured Interview

This interview is part of my PhD research that attempts to examine the effect of using the flipped classroom instructional model⁴ on EFL learners.

Part One: Background Information

- 1- What degree do you hold?
- 2- For how many years have you been teaching English at University?
- 3- What is your field of study?
- 4- Are you a full time-teacher or a part-time teacher?
- 5- How long have you been using the flipped classroom as an instructional model?
- 6- What modules have you been teaching using the flipped classroom?

Part Two: Teaching via the Flipped Classroom Model

- 7- What are the main differences you noticed between teaching with a conventional method and teaching via a flipped classroom?
- 8- What are the flipped classroom's main benefits compared to conventional teaching?
- 9- Do you develop your own flipped lessons or use ready-made flipped lessons?
- 10- What kind of activities and materials do you use in your flipped lessons?
- 11- How do you describe the learning environment while teaching via the flipped classroom?
- 12- How do you describe your learners' engagement when using the flipped classroom?
- 13- Do you consider learners' differences in your classroom? (personalities, learning styles, etc.)

⁴ A flipped classroom is a type of blended learning where students are introduced to content at home and practice working through it at school. This is the reverse of the more common practice of introducing new content at school, then assigning homework and projects to be completed at home.

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14- Do you think the flipped classroom helps deal with different types of learners, like extroverts and introverts?

15- Did the flipped classroom help introverted students participate and engage more in learning?

16- Which way do you think the flipped classroom improved your learners' engagement?

- a) Class participation
- b) Asking questions
- c) Group work
- d) Risk-taking
- e) Motivation
- f) Overcoming fear of speaking
- g) Attention and focus
- h) Interest in learning

17- How often do your students do the in-home activities before coming to class?

18- Did your students enjoy learning via the flipped classroom?

19- Do you recommend using the flipped classroom to enhance students' engagement? And why?

Thank you!

Appendix 4: Request for Permission to Conduct Research

Request for Permission to Conduct Research

Head of the English Department
Faculty of Letters and Languages
8 Mai 1945 University of Guelma

Dear Sir,

I am writing to request permission to conduct research for my Ph.D. studies within the department under your supervision. I am a doctorate student specializing in Didactics in the English Department of Amar Telidji University of Laghouat.

The aim of this research is to obtain knowledge about using the flipped classroom as an instructional model for EFL students taking into account their personality type being an introvert or extrovert. I am confident that this research will provide valuable insights into EFL research in general and into promoting EFL students' engagement and learners' differences in particular.

The research will be conducted in accordance with ethical principles and will comply with all relevant regulations and policies including confidentiality. The data collected will be used for research purposes only and the names of participants will not be mentioned.

I am requesting permission to conduct this research within the English Department and would appreciate your assistance in the successful completion of this project.

Thank you for considering my request. I look forward to discussing this matter further with you and obtaining your permission to proceed with the research.

Sincerely,
Amani Bouchareb

Signature

جامعة 8 ماي
قسم اللغتين الإنجليزية والفرنسية
الأستاذة الدكتورة: لياخنة عبد الكريم
1101

Résumé

La quête de méthodes pédagogiques efficaces pour améliorer l'engagement parmi les différents types de personnalité des apprenants de la langue étrangère anglaise est cruciale dans le paysage éducatif actuel. Les environnements de classe traditionnels échouent souvent à répondre aux besoins spécifiques des apprenants introvertis, qui peuvent éprouver des niveaux plus élevés d'anxiété et une participation moindre. Cette étude examine le potentiel du modèle pédagogique de la classe inversée pour améliorer les niveaux d'engagement académique parmi les étudiants EFL introvertis en s'alignant sur leurs préférences cognitives et leurs besoins éducatifs. L'étude de cas de cette recherche concerne les étudiants de troisième année du département d'anglais de l'Université de Guelma. Adoptant un design de recherche véritablement expérimental et à méthodes mixtes, l'étude a impliqué des outils quantitatifs et qualitatifs. Les données quantitatives ont été collectées à l'aide de l'Inventaire d'Engagement des Étudiants Universitaires (USEI) et d'un questionnaire destiné aux étudiants, tandis que des perspectives qualitatives ont été recueillies grâce à l'Indicatif de Type Myers–Briggs (MBTI), un test de personnalité, et des entretiens avec des enseignants. Les participants ont été divisés en groupes expérimental et de contrôle pour comparer le modèle de la classe inversée avec les méthodes d'enseignement traditionnelles. Le groupe expérimental composé de 54 étudiants a été enseigné en utilisant la méthode de la classe inversée tandis que le groupe de contrôle, impliquant 57 étudiants, a reçu un enseignement traditionnel. Les résultats mettent en évidence plusieurs dimensions dans lesquelles la classe inversée impacte positivement l'engagement académique, à savoir, comportemental, émotionnel et cognitif. La nature structurée et préparatoire de la classe inversée réduit significativement l'anxiété et augmente la participation parmi les étudiants introvertis. De plus, le modèle profite également aux apprenants extravertis, favorisant un environnement d'apprentissage actif et interactif. Par conséquent, la classe

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inversée apparaît comme une stratégie éducative prometteuse, améliorant l'engagement et les résultats d'apprentissage pour les étudiants EFL et contribuant à l'avancement de la pédagogie de l'enseignement des langues

Mots clés: Engagement; Classe inversée; Apprenants introvertis de l'anglais comme langue étrangère; Apprenants extravertis de l'anglais comme langue étrangère.

ملخص

لقد اصبح اليوم السعي إلى إيجاد طرق تدريس فعالة لتعزيز التفاعل بين أنواع الشخصيات المختلفة من متعلمي اللغة الإنجليزية كلغة أجنبية (EFL) أمر بالغ الأهمية في مجال التعليم. غالبًا ما تفشل الأوساط الدراسية التقليدية في تلبية الاحتياجات الخاصة للمتعلمين الانطوائيين، الذين قد يعانون من مستويات أعلى من القلق ومشاركة أقل. تبحث هذه الدراسة في إمكانية نموذج الفصل الدراسي المقلوب في تعزيز مستويات التفاعل الأكاديمي بين الطلاب الانطوائيين من متعلمي اللغة الإنجليزية كلغة أجنبية من خلال التوافق مع تفضيلاتهم الإدراكية واحتياجاتهم التعليمية. تتناول دراسة الحالة لهذا البحث طلاب السنة الثالثة من قسم اللغة الإنجليزية بجامعة قالمه. باعتماد تصميم بحثي تجريبي ومختلط الأساليب، تضمنت الدراسة أدوات كمية ونوعية. تم جمع البيانات الكمية باستخدام مقياس انخراط الطلاب الجامعيين (USEI) واستبيان الطلاب، بينما تم جمع البيانات النوعية من خلال اختبار الشخصية مايرز-بريغز (MBTI)، ومقابلات مع الأساتذة. تم تقسيم عينة المشاركين إلى مجموعتين تجريبية وضابطة لمقارنة نموذج الفصل الدراسي المقلوب مع طرق التدريس التقليدية. تم تدريس المجموعة التجريبية المكونة من 54 طالبًا باستخدام نموذج الفصل الدراسي المقلوب بينما تلقت المجموعة الضابطة التي تضم 57 طالبًا التدريس التقليدي. تسلط النتائج الضوء على عدة أبعاد يؤثر فيها نموذج الفصل الدراسي المقلوب إيجابيًا على التفاعل الأكاديمي؛ وهي السلوكية، والعاطفية، والإدراكية. يقلل الهيكل التحضيري والمنظم لنموذج الفصل الدراسي المقلوب بشكل كبير من القلق ويزيد من المشاركة بين الطلاب الانطوائيين. بالإضافة إلى ذلك، يفيد النموذج أيضًا المتعلمين المنفتحين، مما يعزز بيئة تعلم نشطة وتفاعلية. وبناءً على ذلك، يظهر نموذج الفصل الدراسي المقلوب كاستراتيجية تعليمية واعدة، حيث يحسن التفاعل والنتائج التعليمية لمتعلمي اللغة الإنجليزية كلغة أجنبية ويساهم في تطوير بيداغوجيا تعليم اللغة.

الكلمات المفتاحية: الانخراط؛ الفصل المقلوب؛ متعلمو اللغة الإنجليزية كلغة أجنبية الانطوائيين؛ متعلمو اللغة الإنجليزية كلغة أجنبية المنفتحين.