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The Flipped Classroom in Italian High School English Classes: Balancing Innovation, Equity and Inclusive Learning

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Abstract. The Flipped Classroom (FC) model inverts the traditional instructional sequence, repositioning content delivery to the home environment and dedicating class time to active, collaborative and participatory learning. By prioritising learner autonomy and deeper engagement, the approach has been proposed as a means of fostering educational equity, particularly for students facing social, cultural and economic challenges. However, empirical evidence regarding its effectiveness in mixed-ability English First Language (EFL) contexts and its impact on impaired learners is limited. This study therefore explicitly aims to examine the extent to which the FC approach can promote inclusivity and reduce educational disparities in mixed-ability EFL classes in Italian public high schools, with particular attention to student engagement, digital equity and differentiated learning. Adopting a mixed-methods approach, which included Action Research design, the teacher-researcher implemented a Flipped Learning Unit across six mixed-ability EFL classes in five different Italian public secondary schools, students aged 15-16 years, during the 2024/2025 school year. Data were collected through a mixed-methods approach combining pre- and post-questionnaires, classroom observations and student feedback, with data triangulation used to enhance reliability and trustworthiness. The findings show how the FC supports equity in diverse classrooms. Students value flexibility and peer collaboration, enhancing inclusivity. Nevertheless, challenges related to independent learning management and cognitive overload were identified, and, despite participants being described as digitally proficient, difficulties in engaging with academic technology were observed. These findings underscore the importance of scaffolding, a structured instructional support and a critically informed approach to technology integration in inclusive EFL education.

Keywords: action research; digital divide; educational equity; flipped classroom; inclusion

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1. Introduction

Contemporary educational discourse increasingly calls for pedagogical reform, as traditional direct instruction models – frequently characterised by passive knowledge transmission and rote memorisation – have been widely criticised for their limited effectiveness in developing the critical thinking skills essential for academic success and professional life (Marlowe, 2012; Prieto, 2018). In response to these shortcomings, innovative student-centred approaches have gained considerable attention, among which the FC model has emerged as a particularly promising alternative. The FC inverts the traditional instructional sequence by shifting content delivery to the home environment, thereby dedicating class time to interactive, participatory activities such as discussions, debates, role-plays, and collaborative project work (Lage et al., 2000). This restructuring provides meaningful opportunities to practise communicative skills, particularly significant in EFL learning, where speaking and listening competencies require sustained interactive engagement.

By allowing students to engage with content at their own pace, the FC model accommodates diverse learning styles and enables learners to direct attention towards areas requiring additional support (Fulton, 2012; Strayer, 2012). This approach repositions educators as facilitators of learning, integrating online resources with face-to-face interaction to create a richer and more responsive instructional environment (Moore & Gilmartin, 2010). The FC model also has significant potential to address learner diversity in mixed-ability classrooms. Through differentiated instruction, teachers can leverage the flexibility of the FC framework to maximise each student's potential and promote equitable learning opportunities (Tomlinson et al., 2003). This is particularly relevant in the Italian public high school context, where mixed-ability EFL classes frequently include students from diverse social, cultural and economic backgrounds, whose varying proficiency levels and unequal access to educational resources pose considerable pedagogical challenges (Alivernini et al., 2019).

The urgency of this pedagogical shift was further underscored by the COVID-19 pandemic, which exposed the persistence of the digital divide and revealed that students from disadvantaged backgrounds often lack equitable access to the technological resources required for effective participation in digitally enhanced learning environments (Zhao et al., 2021). Van Dijk (2020) explains that digital inequality extends beyond access to devices and the internet to include differences in digital skills and the ability to use technology effectively. This multilayered conceptualisation of the digital divide is particularly salient in the present study's context, where socioeconomic disparities among learners may significantly mediate the effectiveness of FC-based instruction. In this context, the rigid, hierarchical application of Bloom's taxonomy characteristic of traditional Learning Units (LU) (Armstrong, 2010; see Figure 1) has been increasingly reconsidered in favour of more flexible, inclusive instructional designs:

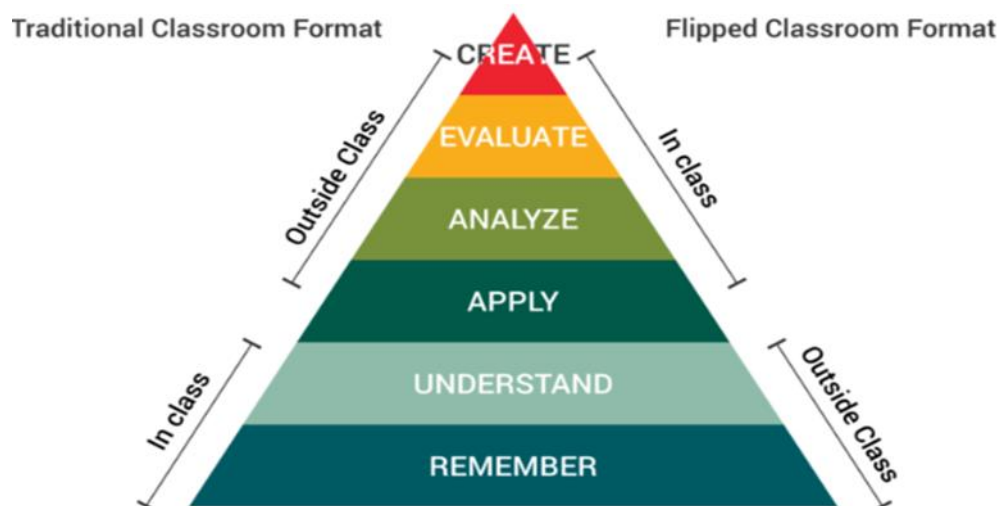


Figure 1: Revised Bloom's Taxonomy applied to FC design

Source: Armstrong (2010)

The theoretical grounding for such inclusive designs draws on a growing body of scholarship reconceptualising educational equity not as uniformity of provision, but as the deliberate removal of barriers to full participation in learning. UNESCO (2020) defines inclusive education as a process of addressing the diversity of needs of all learners, emphasising that equity requires structural transformation rather than superficial accommodation. In the EFL context specifically, Cummins (2021) positions equitable language teaching as requiring explicit acknowledgement of learners' diverse linguistic, cultural and socioeconomic resources. Collectively, these perspectives suggest that the FC model should be evaluated not only as an instructional approach but also as a means of promoting educational equity, as its impact depends on how it is implemented (Gorski, 2026).

Specifically, the study is guided by the following research question: To what extent does the FC approach promote active participation, differentiated instruction and equitable learning opportunities in mixed-ability EFL classes, particularly among students from socially, culturally and economically disadvantaged backgrounds?

2. Literature Review

2.1 The FC

The FC has evolved from early calls for active learning into a widely adopted pedagogical approach across both K-12 and higher education contexts. Although no universally applicable implementation model exists (Bull et al., 2012; Prieto, 2018), the approach is recognised for its capacity to accommodate diverse learning styles and needs. Effective implementation, however, requires more than simply converting lectures into video content; it demands careful consideration of student needs, learning objectives and the meaningful integration of active learning strategies such as discussions, collaborative tasks and group work (Milman, 2012).

The historical roots of the FC can be traced to Freinet's emphasis on collaborative learning and active student engagement and align theoretically with Vygotsky's (1978) constructivist perspective on the centrality of social interaction in learning (Innocenti, 2022). This constructivist foundation is further echoed in Mazur's (1997) model of peer instruction which similarly emphasises student-to-student interaction as a driver of conceptual understanding (Ağırman & Ercoşkun, 2022). The concept of the inverted classroom was formally pioneered by Lage et al. (2000) and subsequently gained widespread visibility through the Khan Academy platform (2004). Bergmann and Sams (2007) advanced the model further by developing recorded lectures designed to enrich classroom interaction, later consolidating their approach in "Flip Your Classroom" (Bergmann & Sams, 2012).

In the Italian context, Cecchinato, Maglioni and Biscaro played key roles in promoting FC adoption, notably through the association Flipnet and the Class Upside Down Facebook page. Scholars have variously conceptualised the FC as a form of blended learning (Abeysekera & Dawson, 2015) and as a viable alternative to traditional didactic instruction (Pickering & Roberts, 2018), with both perspectives focusing on the centrality of active student engagement. Nevertheless, defining the teacher's role is complex because it varies according to the teaching methods, learning materials and duration of learning (Bell, 2015; Cevikbas & Kaiser, 2020).

The integration of technology is a defining feature of the FC model (Singh et al., 2021); however, its presence in educational settings does not automatically translate into effective or transformative practice. As Pieri and Laici (2017) caution, while technologies hold considerable potential to enhance learning, their meaningful integration requires deliberate pedagogical consideration. The mere availability of digital tools – such as interactive whiteboards used to replicate traditional instructional methods on a digital platform – does not constitute genuine innovation (Rivoltella, 2014). This distinction between the presence of technology and its effective pedagogical deployment is critical to evaluating the true impact of the FC.

Research on the Flipped Classroom (FC) reveals evolving outcomes. While early reviews found FC impacts unclear due to methodological differences (Zuber, 2016), initial studies reported enhanced cognition, motivation (Reyes-Lozano et al., 2015), and satisfaction with self-paced tools (Chandra, 2015). Recent literature confirms these benefits, specifying that success in secondary education requires interactive pre-class materials (Van Alten et al., 2019) and active in-class strategies to foster critical thinking and engagement (Campillo-Ferrer & Miralles-Martínez, 2021; Strelan et al., 2020).

Conversely, significant challenges remain. Students may disengage from non-graded tasks (Singh et al., 2021) or prefer traditional, direct Q&A lectures (Avery et al., 2018; Lo et al., 2017). Furthermore, younger learners risk cognitive overload and time-management frustration without adequate scaffolding (Bond, 2020). Ultimately, FC effectiveness relies heavily on students' baseline self-regulation

and digital literacy, risking the isolation of at-risk students if targeted support is not provided (Rasheed et al., 2020).

Moreover, students with lower motivation levels pose an additional challenge, as they may struggle to engage with pre-class materials, procrastinate, and encounter difficulties similar to those in traditional classroom settings (Abeysekera & Dawson, 2015; Green et al., 2017). The suitability of the FC for certain public-school contexts has also been questioned, particularly due to concerns about homework assignments (Scheb, 2023; Sacco, 2024). Cuffari (2016) also highlights insufficient teacher training and limited empirical evidence to support its use.

Methodological limitations further complicate the evidence base. Reyna et al. (2015), as cited in Cuffari (2016, p. 2-3), note that many FC studies are conference papers or use weak research designs. Similarly, Bell (2015) argues that there is limited empirical evidence to measure the effect of the FC on learning outcomes. Given the absence of a universal implementation framework, practitioners are generally advised to begin with a simplified model that prioritises core learning principles over technological complexity, as introduced in James Madison University workshops, emphasising learning principles over technology (Driscoll, 2005):

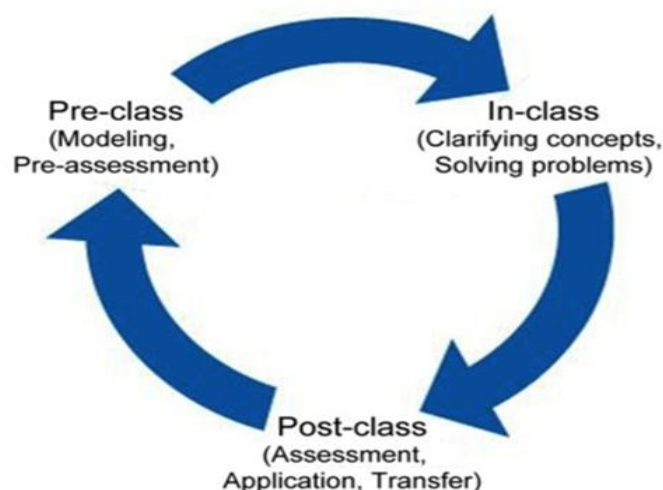


Figure 2: Start Small and Build: How to Ease into Flipping Your First Classes

Source: International Higher Education Teaching and Learning Association (2014)

2.2 Inclusive Education: Bridging socioeconomic gaps and embracing diverse learning needs

The concept of inclusive education has been the subject of sustained theoretical debate. Nilholm (2021) offers a valuable synthesis of contemporary perspectives, shifting the focus from theoretical categorisation towards the practical implementation of inclusive principles in real educational settings. This aligns with the broader definition of inclusion adopted at the Global Education Meeting held in Brussels in 2018, which views inclusive education as supporting all

marginalised learner groups and calls on educators to use responsive and inclusive teaching approaches (Florian & Murdoch, 2021).

Inclusive pedagogy, as explored by Florian and Black-Hawkins (2011), encompasses educational practices that aim to broaden curriculum access for all learners through whole-class approaches, rather than through separate or targeted interventions. Complementing this perspective, Jerrim et al. (2019) examined how socioeconomic inequality affects student achievement, highlighting the methodological challenges inherent in cross-cultural comparative research and analysing socioeconomic disparities as reflected in international assessments such as TIMSS and PISA (OECD, 2019). Together, these studies underscore the structural nature of educational disadvantage and the urgency of pedagogical responses capable of addressing it.

Within EFL contexts specifically, students from socially, culturally and economically disadvantaged backgrounds frequently encounter compounded barriers to participation, including limited English proficiency, restricted access to educational resources, and inadequate provision of technological devices or reliable internet connectivity. The lack of these resources is itself a form of educational exclusion (Sanders & Scanlon, 2021). This became especially evident during and after the COVID-19 pandemic, when the rapid shift to online learning exposed persistent digital inequalities (UNESCO, 2020). Ensuring equitable access to technology is therefore not merely a logistical concern but a fundamental dimension of inclusive education practice (Murdoch et al., 2021). The affective and relational dimensions of learning also merit attention in this context. Alivernini et al. (2019) emphasise the role of positive emotions and peer relationships in supporting student success, particularly among learners from disadvantaged backgrounds.

Furthermore, research by Salinas (2021) and the OECD (2020) reveals significant disparities in access to foreign language instruction, linked to unequal resource distribution and differing institutional priorities. Educational systems characterised by greater socioeconomic inequality tend to deprioritise foreign language learning for disadvantaged students in favour of core subjects, further compounding existing inequities. In this respect, the FC model holds meaningful potential for addressing equity in education: its flexible, self-paced structure can provide students from disadvantaged backgrounds with the additional time and support they require to engage effectively with new concepts, mitigating the impact of limited access to quality educational resources (Devlin et al., 2012).

3. Methodology

The Research Design model proposed by Elliott et al. (1993) was used to determine the various steps involved in the research: identifying the problem and causes, stating the goals, formulating hypotheses, collecting relevant information, testing the hypotheses and interpreting the findings. To ground the research on solid basis, some categories proposed by Gall, Gall et al. (2007) were used: the approach is grounded in constructivism, emphasising the ongoing construction of social reality in specific contexts like schools, where teachers play a crucial role in

explaining causal relationships, supported by data from questionnaires and Learning Unit management. The figure shows the cyclical nature of Action Research, adapted from Gall et al. (2007):

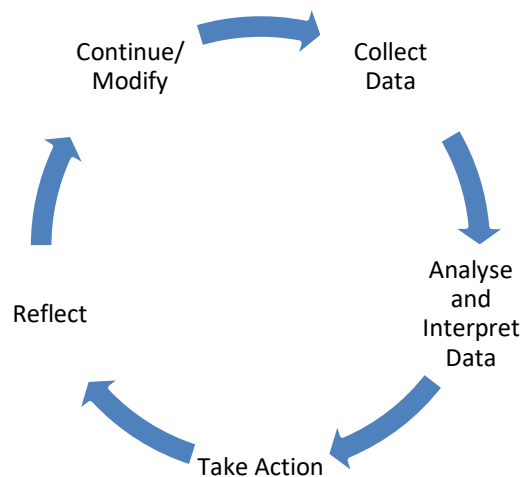


Figure 3: Cyclical nature of Action Research

Source: Gall et al. (2007)

3.1 Data Collection and Analysis

There is a growing need to address educational disparities, particularly in mixed-ability classrooms and to explore innovative teaching practices that can promote inclusivity. The FC approach, which emphasises active learning and peer interaction (Moore & Gilmartin, 2010), has been shown to engage students more deeply, potentially reducing learning gaps. Furthermore, as education increasingly relies on digital resources, it is important to examine whether the FC can help reduce the digital divide (Sanders & Scanlon, 2021), particularly in Italian public high schools where socioeconomic factors may affect access to technology.

3.2 Description of the implemented study

The study collected data from six high school classes in their third year (Italian high schools offer five-year programmes) across three courses: Scientific Lyceum, Technical School and Vocational School. They have three English lessons a week, taught by Italian teachers who graduated in EFL.

To serve the study question, each school represents a different socio-cultural area in Turin:

- An area characterised by middle-class students.
- An area characterised by migration and families with less advantaged cultural and economic backgrounds.

Table 1: Demographic of the participants

Schools involved	5
Classes involved	6
Total students	124
Teachers	6
Female/male percentage	68% Female 32% Male
SEN (Special Educational Need)	Student ratio per class 22%

Informed consent was obtained from the student families, who were briefed about the study objectives through a meeting at school. Engaging families in the educational process is important, aligning with the principles of Participatory Education (Bellido-Cala, 2021) which recognises families as partners in education since they uniquely understand their children's needs and strengths (Arce, 2019). Parents appreciated having access to the lessons and videos as well, helping them see what would be expected so they could better provide help, if necessary (Lo & Hew, 2017). This participatory approach underscores the importance of family involvement in educational settings, particularly within inclusive education, linked to social equity and justice (Stavroussi et al., 2021).

The research informants were 124 Grade 11 high school students, aged approximately 15 to 16 years, enrolled in six classes across five different schools. The schools were selected to reflect diverse institutional contexts, and the classes were chosen because they implemented the instructional approach under investigation in this study. Families were asked to sign the authorisation to allow an external teacher to conduct this study. All personal details were kept on the teacher's password laptop and protected by a password.

When the students' families were informed that FC activities would contribute to formal assessment, they expressed concerns and requested an alternative approach. Consequently, it was agreed that evaluation would be carried out through observation-based methods, including checklists, in line with Hopkins (2014). While this approach may appear to reduce the emphasis on formal assessment, assessment was embedded throughout the learning process. Such ongoing evaluation involves the continuous observation and documentation of both individual and group student outcomes, thereby offering valuable insights into students' learning processes (Cecchinato et al., 2014).

3.3 Procedure

The English teachers involved were required to have strong pedagogical skills and a deep understanding of the approach, including the ability to evaluate its suitability and effectiveness both within and outside the classroom (She, 2021). They were instructed through explanatory YouTube videos, such as Fanello (2023) and Cecchinato (2014).

Their preparation involved guided training via instructional videos, collaborative meetings within the research team, and participation in courses organised by the Italian association Flipnet. The Learning Unit (LU) was the same, with consistent

pacing and content, identical labs, projects, materials and homework assignments. It was administered at the beginning of the second term, over six classes between January and March 2025, in collaboration with the English class teachers, who were always present during the LU. Google Classroom was used to share the materials, and Google Forms to answer the questionnaires.

To ensure clarity and student understanding, at the beginning of each week, teachers provided explicit learning objectives, detailed instructions and assessment rubrics for all upcoming tasks and activities. This was intended to ensure that students remained consistently informed about expectations and could effectively organise their learning independently. Without adequate instructional guidance, learners may use their autonomy in ineffective ways, limiting the achievement of the intended learning outcomes (Kirschner & Van Merriënboer, 2013).

3.4 The Learning Unit

The flipped LU focused on sustainability and aligned with the UN 2030 Agenda for Sustainable Development, using the Smart Tools for Inclusive Teaching (STIT) tool to plan all steps. Students were instructed in Google Forms because they would be doing activities and completing questionnaires administered via this app. They were allowed to use their smartphones to work in class (only a minority owned laptops or tablets). Moreover, a survey was conducted to determine whether they had problems accessing the internet at home and in class: no one did.

The LU was structured into three 50-minute lessons each week for a total of two weeks with a balanced mix of individual and collaborative learning experiences. At the start of each week, students were assigned 10 to 20 minutes of video content to watch outside of class, explaining key points and relevant vocabulary. The videos were made accessible through links on Google Classroom; they had to fill in questionnaires to check that they had understood and retained the material, which were submitted via Google Classroom and reviewed by the teacher.

The in-class lessons started with a short Google Form with five to six items to verify that the students had understood and learned from the videos, thereby correcting any mistakes or misunderstandings. Then, they completed the practical activity, followed by an interactive group discussion to build the basic concepts necessary to proceed, in line with the scaffolding teaching technique (Bruner, 1978). They received instructions and materials about how to organise the collaborative work and the final project using the software they were most familiar with.

Emphasis was placed on organising the various groups because one of the intended outcomes of the activity was inclusivity and the breaking down of social and cultural barriers. Considering that the FC promotes student-centred activities (Bell, 2015), students were given the responsibility to make up groups of mixed-ability peers, assigning each member a role.

3.5 Data Collection

Data were collected between October 2024 and March 2025. The study adopted a mixed-methods design, drawing on both quantitative and qualitative instruments to ensure methodological breadth and analytical depth. Quantitative data analysis involved calculating percentage frequencies and identifying modal responses to determine the incidence and prevalence of satisfaction ratings across Likert-scale items.

A range of statistical procedures was employed, including T-tests, Chi-Square tests, regression analysis, ANOVA, frequency distributions, crosstabulation and standard deviations. The appropriateness and accuracy of these analyses were validated by a specialist in statistics. Qualitative data were gathered through observational methods (Hopkins, 2014), incorporating structured input from both the class teachers and the lead instructor. Data triangulation (Chowdhury, 2015) was applied across instruments and data sources to enhance the trustworthiness and validity of the findings.

The questionnaires consisted of multiple-choice and Likert-scale items, responses coded as dummy variables (yes/no and true/false), nominal categories and both open- and closed-ended questions, administered through Google Forms. Prior to the implementation of the Flipped LU, students completed three background questionnaires addressing their personal profiles, their attitudes towards English language learning, and their perceptions of the curriculum. They also responded to a survey on their use of digital applications and social media platforms, providing contextual data relevant to the study's digital dimension.

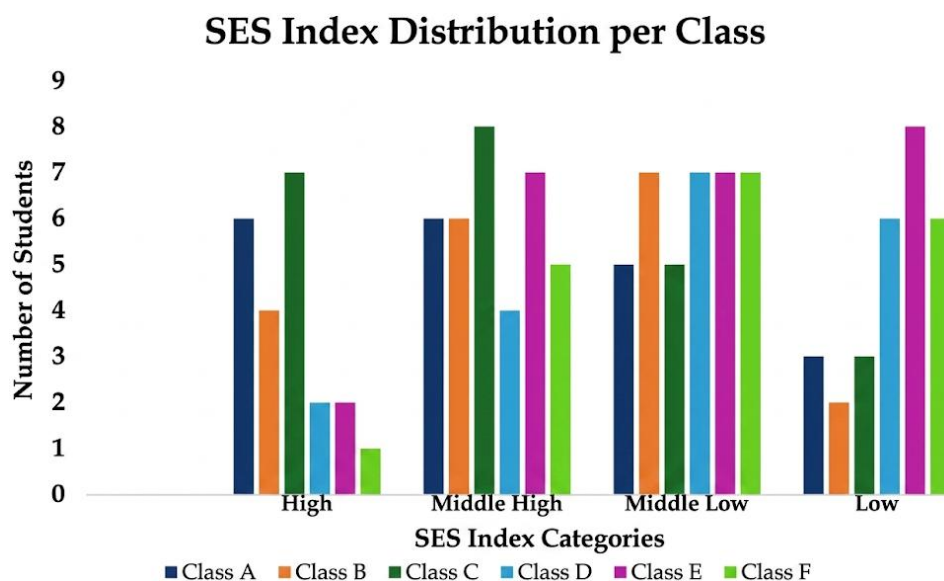
In addition, students completed the Motivational Wheel instrument (Martin, 2022), a validated tool designed to assess learner motivation across multiple dimensions. Questionnaires specifically pertaining to the FC experience included student expectations, administered prior to the unit, and their perception of the module, administered upon completion of the unit. Following the LU, semi-structured interviews were conducted with a purposive sample of three students per class to investigate any practically significant differences in students' attitudes towards the pedagogical approach experienced.

To ensure the confidentiality and anonymity of participants in accordance with ethical guidelines, individual students were assigned numerical codes, and each class was identified by a capital letter. The research adhered strictly to established ethical standards throughout the entire data collection period, ensuring the protection of students' rights, privacy and wellbeing.

4. Results and Findings

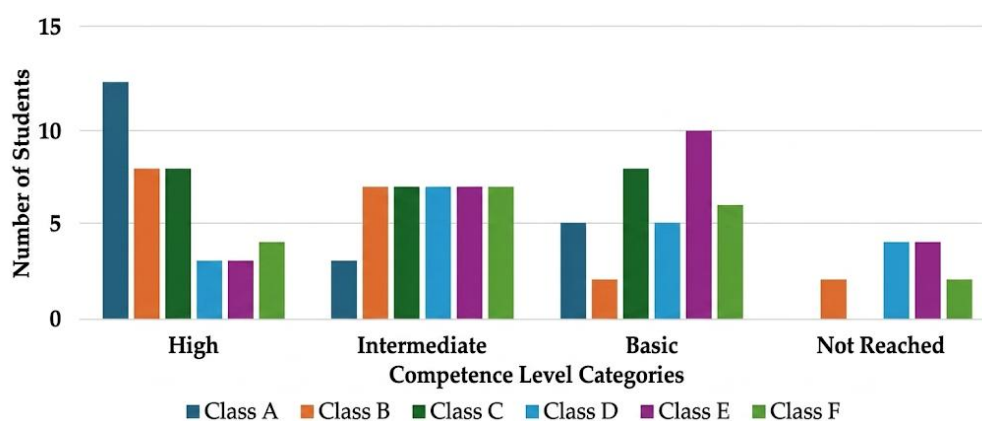
The research question aimed to investigate whether the approach could effectively promote equitable access to learning for all students, taking into account their diverse socioeconomic and cultural backgrounds, while simultaneously addressing the “digital divide” (Cuffari, 2016).

Thanks to the data collected by each school during the 2023/2024 INVALSI assessments [National Institute for the Evaluation of the Education and Training System], the class profiles considering the socioeconomic status (SES) were:



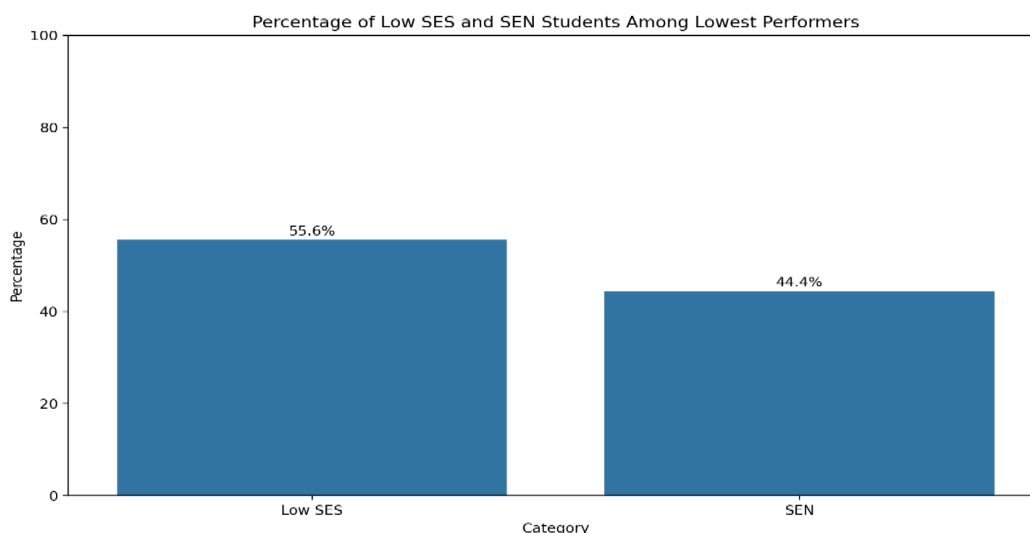
Graph 1: Socioeconomic Status of the involved students

They were used to assess whether low-SES students could benefit from the FC and to address the gap relative to higher-SES peers in the same class. INVALSI assessment regarding the English language was used, where 0 meant they did not get the B1 minimum level, and 4 was the highest for reading comprehension and listening competence.



Graph 2: Level of competence obtained in English at the end of the first term 2024 [High, Intermediate, Basic, Not Reached]

Data analysis shows that higher-SES classes (A, C, E) generally perform better, while lower-SES groups (B, D, F) have more students who do not reach the expected level of competence. This underlines the link between SES and performance, especially for students with SEN, as shown in Graph 3, which shows the percentage of low-SES students among lower performers.



Graph 3: Percentage of low SEN among lower performers in all the classes

An interesting article by Bier (2018, p. 235) reports that:

“The two parties in the teacher-student relationship have their responsibilities and contributions to the learning process. [...]. Both the teacher and the students contribute to a positive learning environment by respecting each other and being committed to doing their best”.

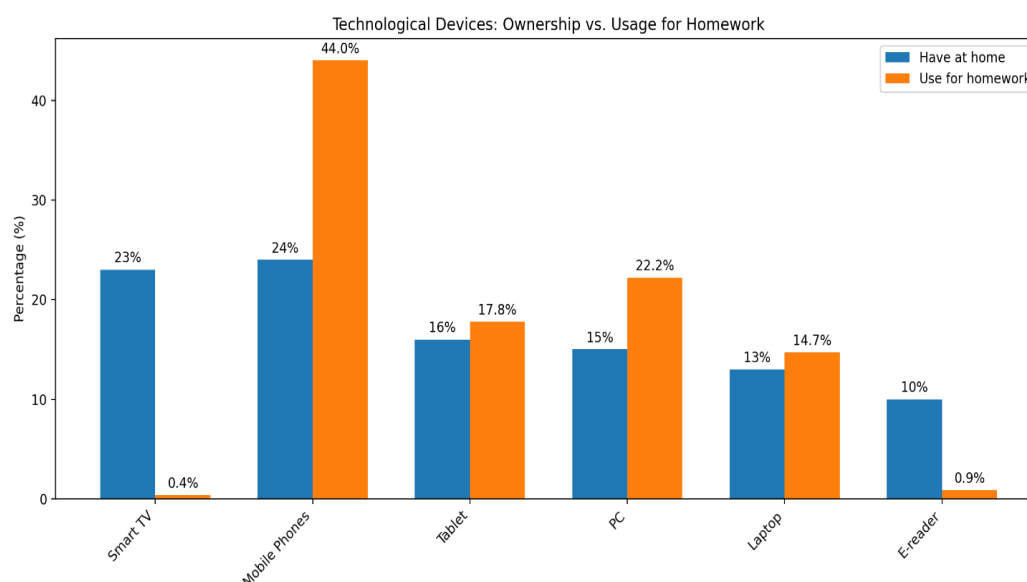
The assumption is also present in Brophy (1986), who dealt with the importance of teacher-student relationships. He argues that the idea that teachers do not make a difference in student learning has been disproven, emphasising the strong link between “teacher relationships” and the quality of instruction. Questionnaire A, “Student Engagement with English Learning Activities”, aimed to gather insights into how students felt about their English class and their teacher before administering the flipped LU to create warm social-emotional relationships with the students. The answers, considering the mean, mode, and standard deviation (SD), showed that all the students had a good level of satisfaction, considering that the mean is above 2 and the SD is less than 1:

Table 2: Questionnaire A. Student Engagement with English Learning Activities: Mean, Mode and Standard Deviation Analysis

QUESTIONS	MEAN	MODE	STANDARD DEVIATION
Listening using the materials in your textbook	2,54	3	0,76
Using the Internet to improve your listening competence	3,18	3	0,76
Watching videos in class	3,13	3	0,77
Watching videos at home, as recommended by your English teacher	2,45	3	0,85
Working in pairs at school	3,42	4	0,75
Using your PC/laptop at school	3,31	4	0,71
Using your mobile phone for projects and work during the lessons	3,13	4	0,82

QUESTIONS	MEAN	MODE	STANDARD DEVIATION
Practising English grammar in class	2,9	3	0,75
Practising English grammar at home	2,15	2	0,87
The teacher explains every part of the lesson in class	3,11	4	0,87

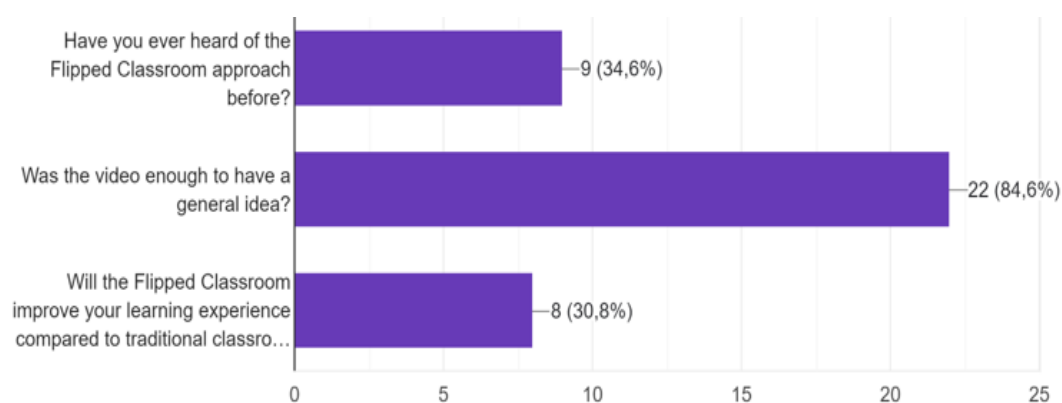
Student Questionnaire C was about the use of technology in their everyday life. The bar chart (Graph 4) shows the percentage of each device owned at home versus the percentage used for homework and studying. The use of diverse study materials reflects students' adjustment to a hybrid learning environment:



Graph 4: Questionnaire C, devices possessed and their use for homework

To get informed about the new approach, they watched a video on YouTube and answered the following questions:

- Watch the video on YouTube: <https://youtu.be/ojiebVw8O0g?si=42J9oGpzra199Dht> and answer the questions”.

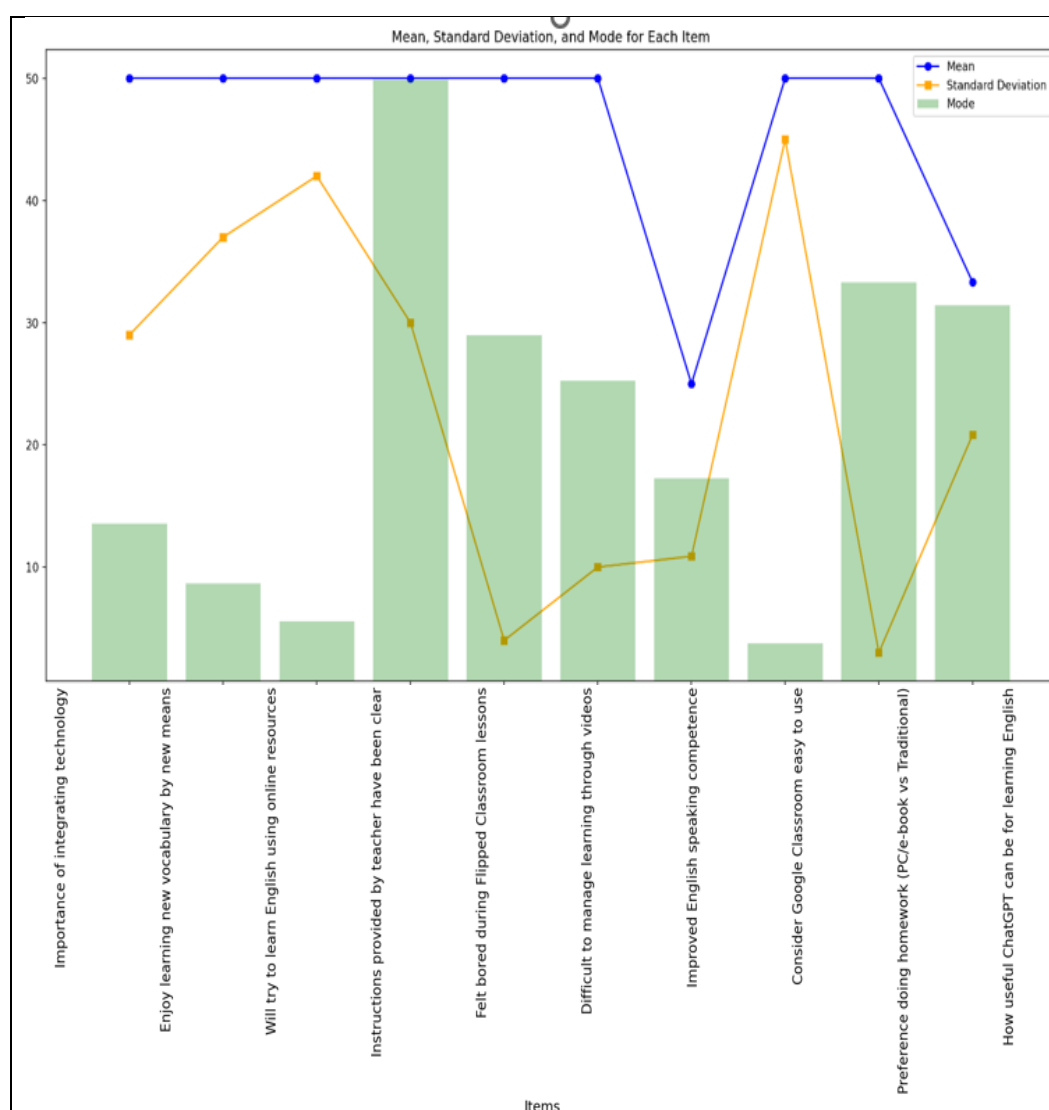


Graph 5: Feedback on YouTube FC video

After watching the video, 84.6% of students understood the concept of the FC approach. Only 34.6% had heard of it before, and enthusiasm was present but modest. 30.8% expressed confidence that it would enhance the learning experience compared to traditional classrooms.

4.1 Findings

The data from the FC Feedback Questionnaire were used to understand student perceptions of technology-based learning and identify areas for improvement in educational practices. The questions and the statistical analysis are summarised in the Graph 6:

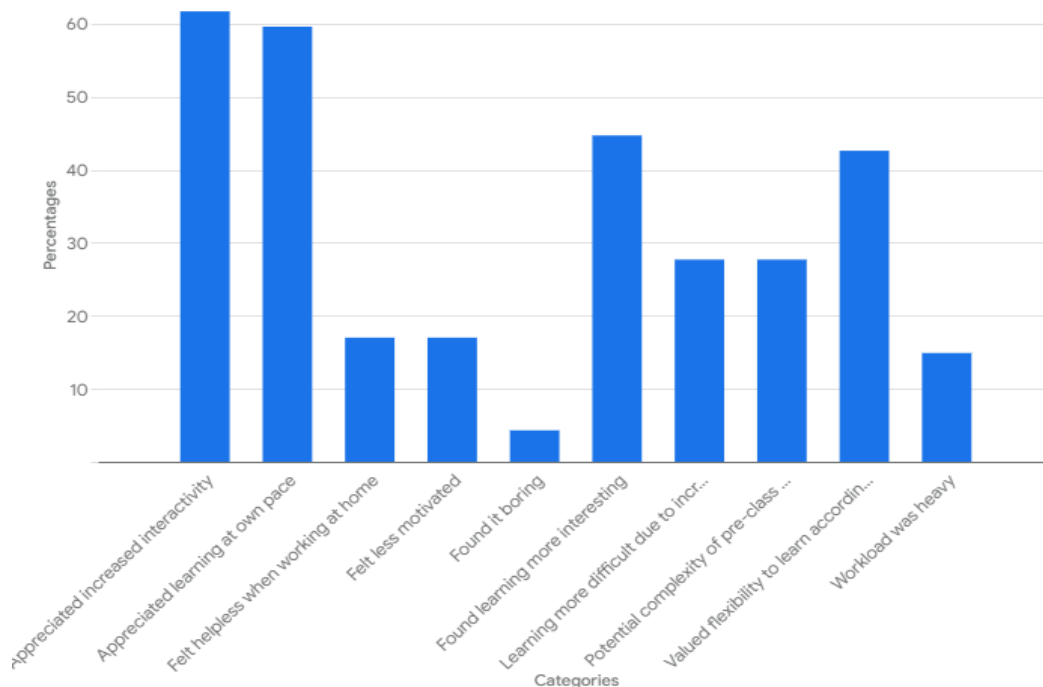


Graph 6: Flipped Classroom Feedback Questionnaire

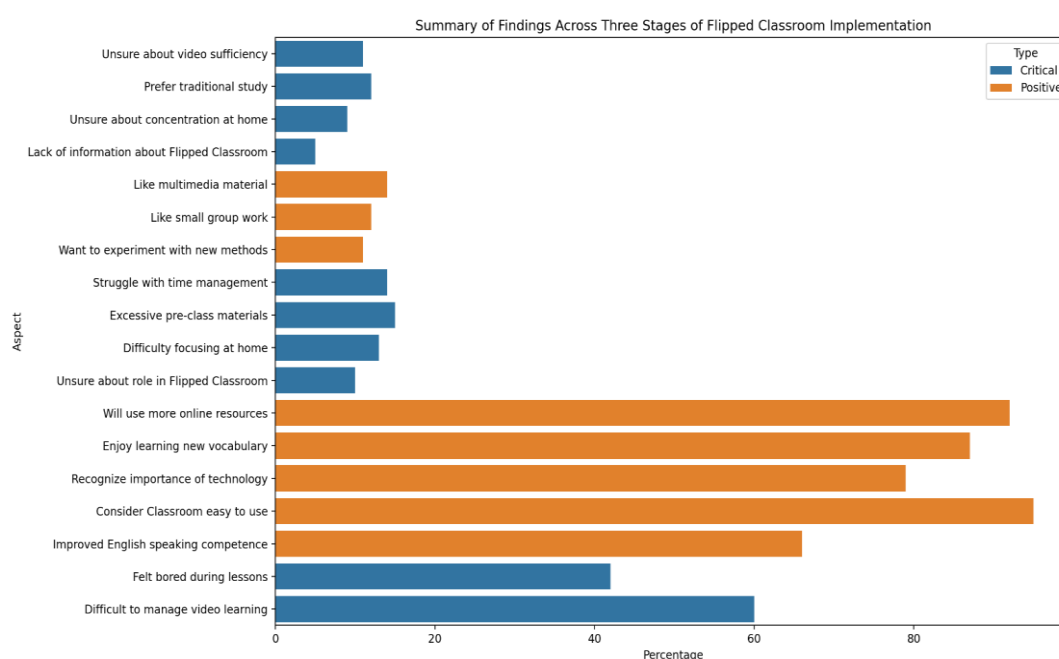
The mean for most questions is 50.0, expected for binary questions where the percentages sum to 100%. The Mode varies significantly across questions, reflecting different response patterns, while the SDs indicate the spread of responses. Higher SDs indicate more varied responses.

Students also assessed the self-paced learning experience (Graph 7) and their perceptions throughout the FC implementation, three stages (before, mid, end) (Graph 8). Preferences for technology-based learning, YouTube and online tools remained strong.

Percentages of Student Feedback on Self-Paced Learning in Flipped Classroom



Graph 7: Student self-paced learning experience with the Flipped Classroom



Graph 8: Summary of Findings Across Three Stages of FC Implementation

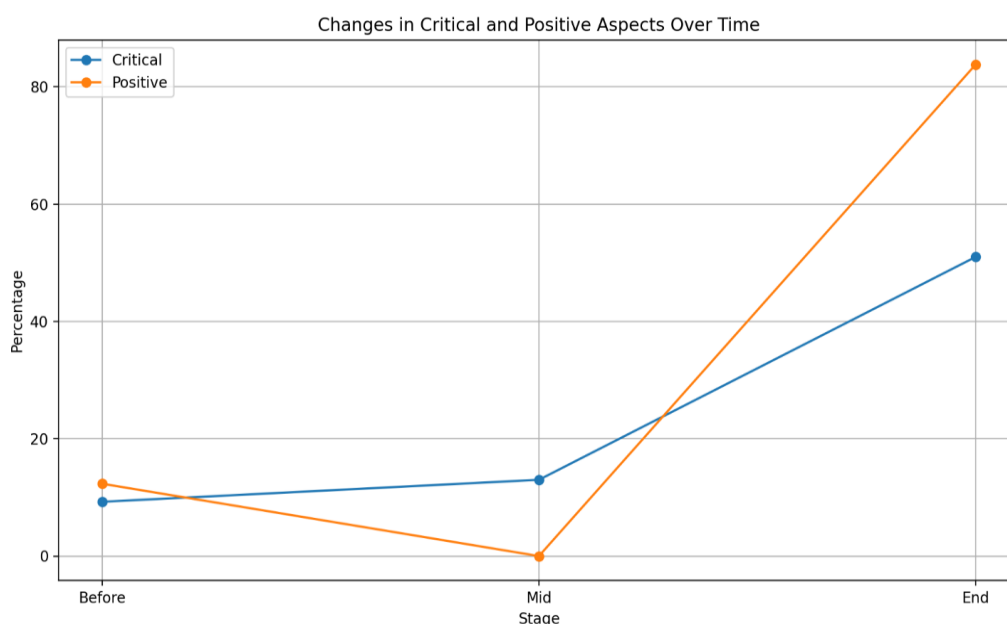
Table 3 provides the numerical data for the three stages (before, end, and mid) across two categories (critical and positive):

Table 3: Numerical data for three stages (before, end, mid) across two categories, critical and positive

FLIPPED CLASSROOM	CRITICAL EXPERIENCE	POSITIVE EXPERIENCE
Before	9.25	12.33
Mid	13	0
End	51	83.8

The table quantifies critical vs. positive perceptions across the FC implementation phases. While initial and final phases showing more positive aspects, mid-phase feedback was mostly critical.

The line graph illustrates the changes regarding critical and positive aspects over time. It depicts this trend, highlighting how initial struggles were eventually addressed:



Graph 9: Findings Across Three Stages of Flipped Classroom Implementation

Table 4 summarises the responses to “motivation and engagement” in the FC experiment, with an average motivation/engagement score of 65.50% and a Median of 62.0%. The SD is 20.55%, indicating some variability, with a variance of 090942.3%. According to the Shapiro-Wilk Test, a p-value of 0.65 indicates that the data are normally distributed ($p > 0.05$). The t-test compares the student mean motivation and engagement scores to a hypothetical mean value (50%).

Table 4: Key components of a t-test

T-TEST KEY COMPONENTS	Null Hypothesis (H_0)	The mean motivation and engagement score is equal to 50%.
	Alternative Hypothesis (H_1)	The mean motivation and engagement score is not equal to 50% (<i>two-tailed test</i>).
	Test Statistic	The t-test statistic measures the difference between the sample mean and the hypothesised mean, scaled by the standard error of the mean.
	p-value	The probability of observing a result at least as extreme as the one obtained, assuming H_0 is true. A p-value less than 0.05 is typically interpreted as evidence against H_0 and therefore as statistically significant.

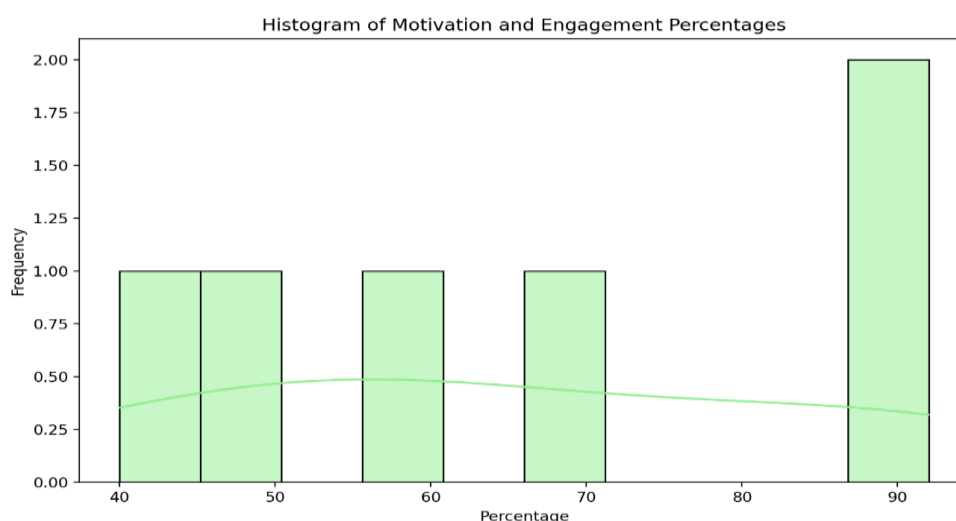
To perform the one-sample t-test, the t-test statistic was calculated using the formula:

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}}$$

where:

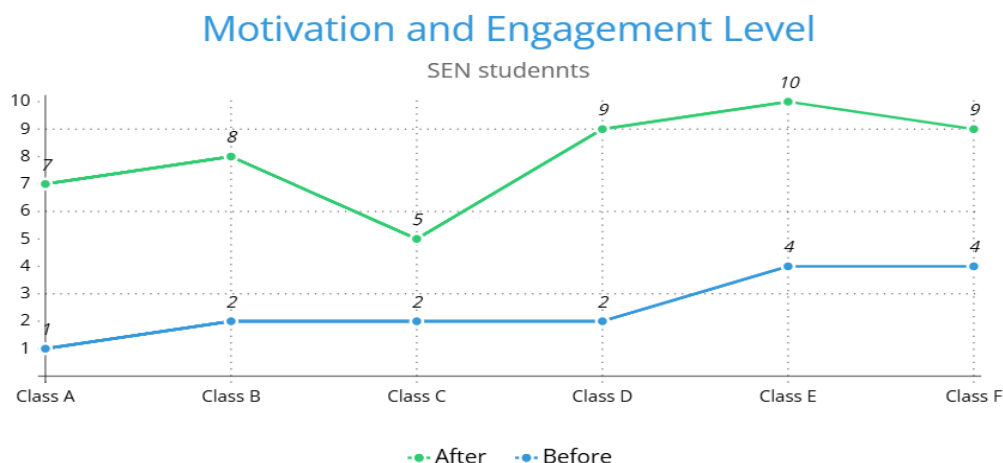
- $\bar{x}$ is the sample mean, equal to 65.5%;
- μ_0 is the hypothesized population mean, equal to 50%;
- s is the sample standard deviation, equal to 20.55 percentage points;
- n is the sample size.
-

The t-test statistic shown in the graph below is $t = 1.85$, with a p-value of $p = 0.12$, suggesting that the mean percentage is not significantly different from 50% ($p > 0.05$).



Graph 10: Flipped Classroom Questionnaires, Motivation and Engagement

Collecting the same data about the SEN students, this was the situation:



Graph 11: Motivation and Engagement Level among SEN students

SEN students' results indicate higher motivation during the FC experiment, suggesting greater inclusivity for these learners. However, variability in motivation levels suggests that the FC approach's effectiveness may depend on school type and pedagogical adjustments.

5. Discussion

The findings of this study suggest that the FC holds considerable promise for enhancing student engagement and motivation, particularly by offering a flexible learning environment capable of accommodating diverse learning needs. Students appreciated the opportunity to learn at their own pace, with 59.6% acknowledging this as a significant benefit (Graph 1), a datum consistent with the emphasis on learner autonomy in FC models highlighted by Zainuddin and Halili (2016).

Additionally, 42.6% valued the learning flexibility afforded by the approach, reporting that it allowed them to manage their schedules more effectively (Graph 2), thereby demonstrating the FC model's alignment with learner-centred pedagogy and self-regulation frameworks. The increase in classroom interactivity was a further key finding, with 61.7% of students recognising its value (Graph 3), lending support to Moore and Gilmartin's (2010) assertion that active learning and peer collaboration contribute to a more inclusive and engaging educational environment.

However, the FC approach was not without challenges. While the self-paced nature of learning offers notable flexibility, it simultaneously places considerable responsibility on students to manage their own learning processes. This tension is evident in Graph 7, where 27.7% of students reported difficulty with the increased autonomy required, particularly in relation to engaging with pre-class materials independently. This finding echoes concerns raised by Lo and Hew (2017) who observed that students frequently encounter difficulties with time management and sustaining attention during screen-based learning, both of which can hinder

knowledge retention. These results point to a critical need for structured support systems to facilitate students' successful transition to independent learning formats.

Related challenges are reflected in Graph 8, where 17% of students reported feeling disoriented, and 14.9% perceived the overall workload as excessive. These responses suggest that while the FC approach encourages learner autonomy, it also demands careful instructional design to prevent cognitive overload and ensure students are not overwhelmed. The results reinforce the importance of scaffolding strategies and time-management support, particularly when students are expected to engage with content independently before class sessions. Without adequate in-class reinforcement, pre-class learning may remain superficial. Constructivist theory and Khanova et al. (2015) emphasise that linking pre-class materials with in-class activities is essential for deep and meaningful learning.

The qualitative feedback further confirmed that many students experienced difficulty in transitioning to a self-paced learning model. Without guided reinforcement during in-class time, students struggled to make meaningful connections between pre-class content and subsequent activities, which, in some cases, led to frustration and disengagement (Graph 8). These findings align with constructivist perspectives, which emphasise the central role of instructor-mediated scaffolding in consolidating independently acquired knowledge and fostering higher-order thinking.

The feedback from students with SEN was particularly noteworthy. As indicated in Graph 11, motivation levels among SEN students showed a marked increase, underscoring the potential of the FC approach to engage learners who frequently struggle within traditional instructional frameworks. This trend is especially significant within inclusive education contexts, where differentiated instruction is recognised as a foundational principle. The flexible, self-paced nature of the FC model appeared to provide SEN students with the degree of autonomy that is often necessary for their effective engagement. Nevertheless, the data also indicate that the success of the FC approach among SEN students varied by school type and by the adaptability of the teaching practices employed. These findings highlight the importance of integrating Universal Design for Learning principles and flexible content delivery methods to meet the diverse needs of this learner population effectively.

The analysis of motivation and engagement data (Graph 11) revealed an average score of 65.5%, indicating a moderate level of engagement across the sample. However, the relatively high standard deviation points to considerable variability in student responses, suggesting that while a substantial proportion of students benefited from the approach, others responded less favourably. This variation was further corroborated by the t-test results ($p = 0.12$), which indicated no statistically significant difference between the observed engagement levels and a baseline mean of 50%. While a general trend towards improved engagement is apparent, it cannot be conclusively attributed solely to the FC model. These results are consistent with the observations of Bishop and Verleger (2013) who note that

the effectiveness of the FC approach varies widely depending on contextual factors and implementation quality.

Taken together, the findings of this study suggest that the FC approach, while presenting certain implementation challenges, demonstrates meaningful potential as an inclusive pedagogical model, particularly for mixed-ability and SEN learners. Its effectiveness, however, is contingent upon the quality of instructional design, the availability of appropriate scaffolding, and the adaptability of teaching practices to the diverse needs of the student population.

6. Conclusion

The findings showed that the FC supports equity: 67% of students valued group work and class discussion, indicating a strong preference for collaborative learning. Nevertheless, 17% of participants experienced embarrassment or challenges due to unfamiliarity with the new approach; engagement with specific technology-based tools was infrequent, at 17%, suggesting an area for further integration. At the same time, the data also expose important limitations. A substantial minority of students reported difficulties with independent learning, disorientation and excessive workload. These findings suggest that the model does not automatically promote inclusion and may increase the challenges faced by learners who need clearer guidance and greater support.

The SEN findings are particularly significant because they indicate that the approach may have inclusive potential, but not uniformly across all contexts. Although motivation increased among learners with impairments and special educational needs (SEN), differences across school types indicate that the effectiveness of the FC depends on how it is implemented, including the quality of scaffolding, the accessibility of learning materials and consistent teacher support. This is the principal contribution of the present study: it extends the literature on FC beyond general achievement outcomes by examining its value in inclusive EFL classrooms in Italian public high schools. Rather than confirming that the FC is inherently effective, the study suggests that its educational value depends on careful adaptation to learner heterogeneity, especially where SEN and socio-cultural diversity intersect.

This study was subject to certain limitations that should be acknowledged. The relatively short duration of the implementation – confined to a single LU administered over approximately one month – restricts the depth and longitudinal scope of the findings. Furthermore, the limited number of participating schools, a constraint stemming from the difficulty of securing institutional collaboration, affects the breadth of the dataset. As a result, the findings cannot be generalised beyond the specific context of this study. Further research of longer duration and with a larger, more diverse sample is needed to provide more robust evidence of the FC model's capacity to transform educational practice, particularly regarding its benefits for low-achieving students and those with limited self-regulatory skills.

Conflict

There is no conflict of interest.

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