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SELF-DETERMINATION FACTORS IN SECONDARY FOREIGN LANGUAGE EDUCATION THROUGH PROJECT-BASED LANGUAGE LEARNING (PBL)

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ABSTRACT

The present study investigated the effect of a Project-Based Language Learning (PBL) intervention on the intrinsic motivation, extrinsic motivation, self-efficacy, engagement and perceived autonomy/self-regulation of English as a Foreign Language (EFL) students in two public General Upper Secondary Schools in Greece. The intervention was embedded in the official curriculum unit on fast fashion in the English course and integrated Information and Communication Technologies across three collaborative phases: a group text analysis, an individual poster creation and a structured debate in pairs. A total of 44 Grade 10 students completed a 20-item questionnaire, adapted from established instruments, after the intervention. The results showed that all five subscales yielded scores significantly above the midpoint, with engagement presenting the highest mean. The findings offer encouraging evidence that PBL can positively foster motivation and self-regulation in the context of secondary foreign language education

Keywords: Project-Based Language Learning (PBL), Information and Communication Technologies, English as a foreign language

1 INTRODUCTION

The integration of sustainability themes into English as a Foreign Language (EFL) education has attracted increasing attention, with the United Nations Sustainable Development Goals serving as a springboard. In addition, there is growing recognition that language classrooms constitute fertile ground for the development of critical awareness alongside language development (Cates, 2005; Hauschild et al., 2012). In Greece, the official curriculum for the English course in the General Upper Secondary School (Geniko Lykeio) incorporates thematic units on contemporary global issues, including fast fashion, consumer habits and environmental sustainability (Ministerial Decision 3950/Δ2, 2023). These thematic units can thus be incorporated into teaching characterized by innovative and experiential teaching methodologies.

2 LITERATURE REVIEW

2.1 Project-Based Language Learning in Foreign Language Education

One such methodology could be Project-Based Learning, a student-centered pedagogical approach in which students engage in extended activities that require them to investigate and respond to authentic, complex problems (Thomas, 2000). In the context of foreign language education, Project-Based Learning has been adapted as Project-Based Language Learning (PBL), in which the target language functions simultaneously as the medium and the object of instruction (Beckett, 2006). The core principles for the effective implementation of PBL are content-based learning, learner autonomy, collaborative learning and the integration of language skills into the project activities (Stoller, 2006). Indicatively, PBL appears to have significant benefits for the writing skills of secondary school students (Alotaibi, 2020). Even in cases where no significant effect on student achievement is recorded, a significant effect on student motivation is reported (Guo et al., 2025). Likewise, when PBL is applied to the teaching of English at post-secondary levels, increases in motivation, autonomy and interactive language use are observed (Grant, 2023).

Particularly when PBL is combined with ICT, improvements are also observed in oral production skills (Benlaghrissi & Ouahidi, 2024). This appears to be explained by the relationship between educational technology and self-efficacy in foreign language instruction, with Information and Communication Technologies (ICT) exerting a particularly positive influence while also strengthening students' confidence in their language abilities (Alamer, 2022). Furthermore, research on self-efficacy in relation to ICT in foreign language instruction has shown that intrinsic motivation predicts strategy use and learner satisfaction (Merhi & Meisami, 2025). More broadly, ICT applications have been shown to support teaching, learning and assessment across both general and special education, ranging from online tools for mathematics instruction and for cognitive training and assessment (Drigas & Kostas, 2014; Karyotaki & Drigas, 2015; Drigas et al., 2009) and digital simulations in STEM education (Kefalis et al., 2025) to screening tools for dyscalculia (Pappas & Drigas, 2015), the development of emotional and social skills in children with ADHD and ASD (Bakola et al., 2019) and e-learning environments for students with visual impairments (Drigas et al., 2006). These findings underline the potential of digital tools to support not only language performance but also the psychological parameters that affect the effectiveness of language learning.

The existing literature across a variety of foreign language contexts has shown that PBL enhances students' motivation, engagement and the development of language skills (Guo et al., 2025; Nassir, 2014). However, while the value of PBL has been highlighted and PBL-based studies have been conducted in secondary foreign language education worldwide (Benlaghrissi & Ouahidi, 2024; Zhong et al., 2025), alongside studies that have examined ICT-enhanced PBL interventions systematically integrating digital tools into different activities (Waly & Ashadi, 2024; Belda-Medina, 2021), no quantitative studies have been identified in the context of secondary foreign language education in Greece, beyond a small number of master's-level theses (e.g., Ntalla, 2016; Papaefthymiou, 2016).

2.2 Motivation, Engagement, Self-Efficacy and Autonomy in PBL

As mentioned above, PBL appears to have a particularly positive effect on students' motivation. Self-Determination Theory (Deci & Ryan, 1985) distinguishes between intrinsic motivation, that is, engaging in activities for their inherent enjoyment, and extrinsic motivation, that is, motivation driven by external outcomes or perceived utility. Both forms of motivation appear to predict engagement in the learning process and the achievement of students learning English as a foreign language (Dörnyei, 2007). Motivation is the energy that fuels self-determination, self-efficacy is the tool that makes it attainable, and autonomy is the precondition for its existence (Deci & Ryan, 1985).

At the same time, Chong and Reinders (2025) note that PBL environments, which require students to plan, monitor and evaluate their own activity, favor the development of learner autonomy and self-regulation. Learner autonomy, defined as the ability to take charge of one's own learning (Holec, 1981; Little, 1991), has been approached through instruments that measure metacognitive awareness, goal setting, self-monitoring and, by extension, the shaping of self-efficacy, as well as independent learning behaviors (Lin & Reinders, 2017). Metacognitive awareness and self-monitoring are, in turn, regarded as higher-order layers of self-regulation that can be deliberately cultivated in educational settings (Drigas & Karyotaki, 2019b; Mitsea et al., 2020; Kokkalia et al., 2016). Similarly, self-efficacy, defined as individuals' beliefs in their capability to carry out the behaviors required for specific performance outcomes (Bandura, 1997), has been recognized as a key mediator between engagement in learning and academic satisfaction in foreign language instruction contexts (Alamer, 2022). Finally, a higher sense of self-efficacy has been linked to greater emotional and behavioral engagement in language learning (Wang & Derakhshan, 2021).

Self-Determination Theory (Deci & Ryan, 1985) was selected as the main interpretive framework of the present study, as it appears consistent with the characteristics of PBL: its three basic dimensions (autonomy, competence, relatedness) map directly onto the structural features of PBL. Indicatively, the selection and shaping of the project is characterized by autonomy, the visible deliverables and feedback are linked to competence, and, finally, the

collaborative phases of the project offer relatedness with peers. In contrast to other motivational frameworks, such as expectancy-value theory (Eccles & Wigfield, 2002), which focuses primarily on individual expectations of success and the subjective value of the task, Self-Determination Theory emphasizes the environmental conditions that support or undermine motivation, that is, precisely the conditions that the present intervention sought to shape. This choice therefore allows the design features of PBLL to be linked to the measured self-regulation parameters within a shared theoretical foundation.

3 METHODOLOGY

3.1 Research Design and Aim

The present study adopted a quantitative, questionnaire-based research design. The quantitative approach was chosen in order to provide an empirical evaluation of the effect of a PBLL-based intervention on key self-regulation parameters that influence learning (Dörnyei, 2007).

The present study aims to extend the existing literature by evaluating the effect of an ICT-enhanced, PBLL-based intervention, used to teach the official English curriculum to Grade 10 students in Greek General Upper Secondary Schools, on five self-regulation parameters: intrinsic motivation, extrinsic motivation, self-efficacy, engagement and perceived autonomy/self-regulation. Two research questions arise from this aim:

- RQ1: To what extent does PBLL enhance students' motivation (intrinsic and extrinsic) and engagement in learning English as a foreign language?
- RQ2: To what extent does PBLL affect students' self-efficacy and perceived autonomy/self-regulation?

3.2 Participants and Context

The participants were 49 Grade 10 students from two public General Upper Secondary Schools (GEL) in Greece, 44 of whom responded to the questionnaire administered (Two intact classes within the regular course, with voluntary completion of the questionnaire). Convenience sampling was used, as the intervention was embedded in the existing course schedules. In addition, the researcher was also the course teacher for the entire school year. All required permissions were obtained before the questionnaire was administered; however, the students' demographic data were not recorded for reasons of anonymity.

4 THE PBLL INTERVENTION

The intervention was based on the sixth unit of the official English coursebook (The topic was not freely chosen but was part of the prescribed syllabus), which deals with fast fashion, consumer habits, sustainability and environmental impact. Fast fashion, as a sustainability topic, offers particularly rich possibilities for teaching English as a foreign language, as it connects economic, environmental and ethical dimensions, encourages argumentation and the critical evaluation of sources, and intersects with adolescent students' lived experience as consumers (British Council, 2023).

The intervention consisted of three interconnected phases implemented over approximately two weeks and six teaching periods (45 minutes each). Students' completed work was digitized using the free software Canva and uploaded to a virtual bulletin board (Padlet) for peer review and feedback, thus creating an asynchronous collaborative space. During the first phase (Group Text Analysis), students formed groups of 4–5 members and worked collaboratively on an excerpt from the coursebook about fast fashion. Each group undertook to identify and define unfamiliar vocabulary, to write headings summarizing the content of the text and to create a concept map that visually organized the main ideas, supporting details and cause-and-effect relationships appearing in the text. In the second phase (Individual Poster Creation), each student designed an individual poster on fast fashion incorporating key issues, relevant visual elements and vocabulary from the unit. In the third phase (Structured Debate), students worked in pairs to prepare and carry out a role-play debate. One student took on the role of a fast fashion company executive defending the industry, while the other played an environmentalist pointing out its drawbacks. Students drew on evidence from the previous phases, the coursebook and independent online research. Throughout the project, students were explicitly instructed to critically evaluate sources for reliability, bias and relevance.

5 INSTRUMENT

A 20-item questionnaire on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was administered after the intervention. The items were adapted from four existing instruments: the Scale of Language Learner Autonomy (SLLA; Lin & Reinders, 2017), the Student Engagement in the Classroom Scale (Reeve, 2013), the Learning Motivation Questionnaire (Han & Xu, 2010) and the Motivation and Anxiety in Collaborative Learning Scale (Pintrich & De Groot,

1990). The original items were translated, their content was reviewed by a second teacher, and an informal pilot reading was then conducted with a small number of students to ensure that the content was comprehensible to them. The questionnaire was subsequently adapted and administered in Greek to ensure comprehension, and was organized into five subscales of four items each: Intrinsic Motivation (Items 1–4), Extrinsic Motivation (Items 5–8), Self-Efficacy (Items 9–12), Engagement (Items 13–16) and Perceived Autonomy/Self-Regulation (Items 17–20). The instrument was distributed electronically via Google Forms.

5.1 Data Analysis

Given the ordinal nature of Likert-scale data and the relatively small sample size ($N = 44$), priority was given to non-parametric analyses, conducted in SPSS (IBM SPSS Statistics Version 21). Shapiro–Wilk tests confirmed non-normal distributions for all subscales ($p < 0.05$).

6 RESULTS

Internal consistency was excellent across all five subscales and the instrument as a whole. Cronbach's α coefficients ranged from 0.821 (Intrinsic Motivation) to 0.902 (Autonomy/Self-Regulation), values that exceed the acceptable threshold of 0.70 (Nunnally, 1978). The overall scale yielded $\alpha = 0.965$ for the instrument as a whole. Table 1 presents the reliability coefficients for each subscale.

Table 1: Cronbach's α coefficients for the five subscales

Subscale	Items	α
Intrinsic Motivation	4	0.82
Extrinsic Motivation	4	0.87
Self-Efficacy	4	0.86
Engagement	4	0.87
Autonomy/Self-Regulation	4	0.90
Total Scale	20	0.97

Furthermore, the grand mean across all 20 items was 3.62 ($SD = 1.06$), indicating that participants' responses lay, on average, between the neutral midpoint and agreement (see Table 2). Engagement received the highest mean score ($M = 3.86$, $SD = 1.07$), while Extrinsic Motivation received the lowest ($M = 3.42$, $SD = 1.06$). All subscale medians ranged from 3.50 to 3.88.

Table 2: Means and standard deviations for the five subscales

Subscale	M	SD	Mdn	Skewness	Kurtosis
Intrinsic Motivation	3.67	0.95	3.50	-0.17	-0.50
Extrinsic Motivation	3.42	1.06	3.50	-0.29	-0.13
Self-Efficacy	3.51	1.10	3.62	-0.66	0.01
Engagement	3.86	1.07	3.88	-0.92	0.40
Autonomy/Self-Regulation	3.62	1.10	3.75	-0.57	-0.29

In order to answer the research questions, Wilcoxon signed-rank tests were conducted to determine whether each subscale differed significantly from the neutral midpoint of 3.0. As shown in Table 3, all five subscales were significantly higher than the midpoint ($p < 0.01$), indicating that students reported positive levels of intrinsic motivation, extrinsic motivation, self-efficacy, engagement and autonomy after the PBL intervention. Correspondingly, the one-sample t-tests conducted confirmed these findings, with effect sizes (Cohen's d) ranging from 0.40 (for extrinsic motivation) to 0.80 (for engagement).

Table 3: Wilcoxon signed-rank tests and one-sample t-tests

Subscale	W	p	t(43)	p	Cohen's d
Intrinsic Motivation	101	0.0001	4.66	< 0.001	0.70
Extrinsic Motivation	216	0.005	2.63	0.012	0.40
Self-Efficacy	188	0.005	3.06	0.004	0.46
Engagement	123	< 0.001	5.32	< 0.001	0.80
Autonomy/Self-Regulation	163.5	0.001	3.76	0.001	0.57

Note. The tests compared scores against the midpoint value of 3.0.

Spearman correlations revealed positive relationships among all five subscales. Coefficients ranged from 0.67 (Self-Efficacy and Engagement) to 0.86 (Intrinsic and Extrinsic Motivation), with all correlations statistically significant at $p < 0.001$. These results indicate that the subscales, although conceptually distinct, share substantial variance.

Mann–Whitney U tests revealed no statistically significant differences between the two schools (School 1: $n = 18$; School 2: $n = 26$) on any of the five subscales ($p > 0.05$). The largest effect was observed for Extrinsic Motivation ($U = 307.0$, $p = 0.081$, $r = 0.31$), which approached significance, with students from School 1 ($Mdn = 3.62$) scoring somewhat higher than students from School 2 ($Mdn = 3.12$). The absence of school-level differences suggests that the effects of the intervention were consistent across the two educational settings.

Finally, a Friedman test was conducted to determine whether students' responses varied significantly across the five subscales. The results were statistically significant, $\chi^2(4) = 20.46$, $p < 0.001$, indicating that the five parameters were not rated equally. Post hoc pairwise Wilcoxon signed-rank comparisons with Bonferroni correction (adjusted for 10 comparisons) identified three significant differences: Engagement was rated significantly higher than Extrinsic Motivation (adjusted $p = 0.002$) and Self-Efficacy (adjusted $p = 0.038$), and Intrinsic Motivation was rated significantly higher than Extrinsic Motivation (adjusted $p = 0.025$).

7 DISCUSSION

The present study examined the effects of an ICT-enhanced, PBL-based intervention on the motivation, self-efficacy, engagement and perceived autonomy of students learning English as a foreign language in two public General Upper Secondary Schools. The results provide converging evidence that the PBL approach, embedded in a sustainability-focused curriculum unit on fast fashion, produced positive affective and self-regulatory outcomes across all measured parameters. This contribution is of particular importance in the Greek context, where the empirical investigation of PBL in secondary foreign language education remains limited and is found mainly in master's theses of a qualitative or descriptive nature (Ntalla, 2016; Papaefthymiou, 2016). The present study extends this existing domestic body of work by adding quantitative data on the effect of an ICT-enhanced PBL intervention on self-regulation parameters.

Regarding RQ1, both intrinsic and extrinsic motivation yielded scores significantly higher than the neutral midpoint, with medium and small-to-medium effect sizes, respectively. The finding that intrinsic motivation was rated significantly higher than extrinsic motivation aligns with the prediction of Self-Determination Theory that autonomy-supportive learning environments, in which students exercise choice, engage in personally meaningful tasks and experience competence, tend to foster internalized forms of motivation (Deci & Ryan, 1985). The multi-phase structure of the intervention, which offered creative freedom (Canva posters), authentic collaborative tasks (group text analysis) and performance-based activities (debates), likely satisfied students' basic psychological needs for autonomy, competence and relatedness. These results are consistent with previous PBL research in foreign language contexts, which has consistently reported motivational benefits following project-based interventions (Guo et al., 2025; Grant, 2023).

Engagement emerged as the most highly rated parameter, significantly exceeding both extrinsic motivation and self-efficacy. This finding is consistent with Reeve's (2013) multidimensional conceptualization of engagement, which encompasses behavioral, emotional and cognitive dimensions. The design of the intervention incorporated all three: behavioral engagement through active participation and preparation, emotional engagement through positive group interactions and creative tasks, and cognitive engagement through the deep processing of cause-and-effect relationships. The emotional and cognitive components of engagement are, in turn, closely tied to learners' capacity to recognize and regulate emotions and to direct and sustain their attention (Drigas et al., 2020; Drigas & Papoutsis, 2021; Drigas & Karyotaki, 2019a), both of which were continuously called upon by the collaborative tasks.

The interactive and multimodal nature of the tasks, supported by ICT, likely strengthened students' sense of involvement and commitment to the learning process. This finding is in line with previous studies that have combined PBL with digital tools in secondary EFL contexts (Benlaghrissi & Ouahidi, 2024), which found that mobile-assisted PBL significantly enhanced the engagement and productive skills of students learning English as a foreign language. It also agrees with other studies reporting corresponding benefits for motivational parameters and oral performance through a video-enhanced PBL approach (Zhong et al., 2025). The convergence of the present findings with these studies reinforces the interpretation that integrating ICT into the phases of a project acts as a catalyst for engagement, beyond the benefits of PBL per se.

Regarding RQ2, self-efficacy scores were significantly higher than the neutral midpoint, with a medium effect size ($d = 0.46$). Although this represents a positive outcome, self-efficacy was among the lowest-rated parameters. As Bandura (1997) observed, efficacy beliefs develop gradually through mastery experiences, vicarious learning and social persuasion. As a relatively brief intervention, the PBL project may have provided initial experiences of success in English (e.g., successfully creating posters and conducting debates in English) without, however, sufficient repetition for a deeper development of self-efficacy. This interpretation aligns with the findings of Alamer (2022), who noted that sustained instruction was necessary to produce robust changes in self-efficacy beliefs in foreign language instruction.

Perceived autonomy and self-regulation yielded scores significantly higher than the neutral midpoint, with a medium effect size ($d = 0.57$). The use of digital tools may have contributed to students' sense of control over their learning process, which is in line with the existing literature (Rashid et al., 2019). The structure of the intervention, which required students to set goals, manage their contributions to group work, reflect on their progress and conduct independent research, naturally supported self-regulatory behaviors aligned with the cyclical model of self-regulated learning (Zimmerman, 2000).

The correlations among the subscales ($r_s = 0.666$ – 0.859) support the theoretical interconnectedness of these parameters. Autonomy/Self-Regulation functioned as a particularly central parameter, correlating with all other subscales ($r_s = 0.775$ – 0.819). This pattern is consistent with the existing literature: self-regulated learners who exercise autonomy are more likely to maintain intrinsic motivation, to develop self-efficacy through self-monitoring and to sustain high engagement through the strategic allocation of their effort (Pintrich & De Groot, 1990; Lin & Reinders, 2017).

The absence of significant school-level differences is noteworthy and suggests that the PBL intervention is equally effective across different settings. This makes it a matter of considerable practical importance, as it constitutes an encouraging indication that the approach can be implemented effectively in diverse school contexts.

7.1 Limitations and Future Directions

Several limitations should be acknowledged. First, the absence of a control group and a pre-test, as well as the absence of a follow-up measurement to assess the retention of responses, precludes any causal inference, as the positive ratings observed may reflect pre-existing dispositions rather than effects of the intervention. Future research should adopt quasi-experimental designs with a pre-test and post-test. Second, the sample size ($N = 44$) limits statistical power and generalizability. Studies with larger samples are therefore needed, possibly conducted in different secondary education settings (general and vocational upper secondary schools, GEL-EPAL), in order to establish whether the results hold across student populations with different characteristics and educational priorities. A further limitation of the present study is that no data were collected on students' gender. Moreover, the exclusive reliance on self-report data introduces potential social desirability bias, while the dual researcher–teacher role may have led to researcher bias and to pressure on students to conform by giving positive responses. Triangulation with observational data, quantitative learning outcome data and teacher assessments would strengthen validity. In addition, the cross-sectional design cannot capture the trajectory of motivational and self-regulatory development over time. Furthermore, the questionnaire was administered in Greek, and although the items were adapted from validated instruments, no formal validation of the Greek adaptation (e.g., confirmatory factor analysis) was carried out; this should be addressed in future work. Finally, the implementation of the intervention may have produced a novelty effect, which may have influenced some of the students' responses.

8 CONCLUSIONS

The present study provides some evidence that ICT-enhanced PBL, embedded in a curriculum unit for the teaching of English, can foster positive outcomes in motivation, self-efficacy, engagement and self-regulation among Grade 10 General Upper Secondary School students. The multi-phase structure of the intervention, which combines collaborative text analysis, individual digital poster creation and structured debate, was designed to address multiple dimensions of student engagement and autonomy, supported by digital tools that facilitated creativity, collaboration and authentic communication. The findings contribute to the growing literature on PBL in English as a foreign language education.

At a practical level, the intervention offers a realistically implementable framework for teachers who wish to integrate PBL into the teaching of English. The design was implemented in six teaching periods within the regular timetable and made use exclusively of free digital tools (Canva for creating the posters and Padlet for the asynchronous collaborative feedback space) on the interactive whiteboard available in the classroom, which makes the approach accessible at no additional cost. The minimum logistical requirement is students' access to digital devices and the internet, inside or outside school. In addition, the structure of the intervention lends itself to differentiation according to students' language proficiency level; that is, the difficulty of the textual material, the range of vocabulary required and the complexity of the roles in the structured debate can be adjusted so that the same sequence of phases remains functional across different classes and levels.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The Authors proclaim no conflict of interest.

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