

Place (Personalized Learning Courseware) For ESL Teachers as a Resource to Improve Students' Grammar

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ABSTRACT

This study investigates the potential of Personalised Learning Courseware (PLaCE) as a resource to enhance grammar instruction in English as a Second Language (ESL) settings. In an increasingly interconnected world, proficiency in English grammar is paramount for ESL learners, serving as the foundation for effective communication. Traditional pedagogical approaches and standardised materials often struggle to address the diverse needs and learning styles of ESL learners. PLaCE emerges as a promising solution, leveraging technology to provide ESL teachers with dynamic and adaptable tools for personalised grammar instruction. The development of the PLaCE involved drawing upon the theoretical frameworks of Mayer's, Gagne nine events of instruction and personalised learning. The courseware was designed to provide a personalised learning experience for ESL learners, incorporating adaptive learning technologies that adjust the content and difficulty level to the learner's individual needs. The courseware also provided real-time feedback on learners' progress, allowing teachers to monitor their learners' performance and identify areas of weakness. The results showed that PLaCE had a positive impact on students' grammar learning, with experimental groups demonstrating significant improvements in grammar knowledge and application. Hence, this study evaluates the measurable impacts of PLaCE on learners' grammar proficiency, highlighting its potential to bridge gaps in conventional grammar instruction. Also, it suggests that personalised learning courseware can be a valuable addition to traditional classroom instruction. However, future research is needed to examine the long-term effects of PLaCE and to investigate the specific features of PLaCE that contribute to its effectiveness.

Keywords: Personalised Learning Courseware, English as a Second Language, Mayer's multimedia theory, Gagne nine events of instruction, learning styles

INTRODUCTION

In an era marked by globalisation and rapid advancements in technology, the English language has evolved into a global lingua franca, transcending borders and cultures. Proficiency in English has become an essential skill, and English as a Second Language (ESL) education plays a pivotal role in equipping non-native speakers with the language skills needed for academic, professional, and social success. The development of grammatical competence, which serves as the structural foundation for effective communication, is central to ESL instruction.

Traditionally, ESL teachers have relied on conventional pedagogical methods and standardized materials to teach grammar. However, the one-size-fits-all approach often falls short of addressing the diverse needs and learning styles of ESL learners (Inthanon & Wised 2024), which can lead to gaps in understanding and engagement among students. A more Personalized Learning Courseware (PLaCE) is an innovative educational resource that harnesses the power of technology to revolutionize ESL grammar instruction. PLaCE offers ESL teachers a dynamic and adaptable toolset to enhance their students' grammar skills, providing tailored content and activities to cater to individual learning preferences and proficiency levels.

This study endeavours to explore the multifaceted dimensions of PLaCE as a resource for ESL teachers, shedding light on its potential to transform the landscape of grammar instruction in ESL classrooms. Specifically, it aims

to investigate the effects of PLaCE and explore whether or not a personalized learning courseware could successfully be used to increase English competency when used as a remediation tool in a university setting. By examining the theoretical foundations, practical applications, and effectiveness of PLaCE, this study intends to provide a comprehensive understanding of how personalized learning courseware can be harnessed as a potent tool in the hands of ESL educators. Furthermore, it seeks to uncover the implications of PLaCE adoption for ESL teachers, students, and the broader field of language education.

The subsequent sections of this research will delve deeper into the conceptual underpinnings of PLaCE: its alignment with off-the-shelf vs. customised courseware, contemporary language acquisition theories, its practical implementation in ESL classrooms, and the measurable impacts it has on students' grammar proficiency. Through empirical analysis and case studies, we will explore the extent to which PLaCE can bridge the gaps in conventional grammar instruction and empower ESL teachers to cater to the unique needs of their students, ultimately facilitating more effective and personalized learning experiences.

LITERATURE REVIEW

Off-the-shelf courseware vs customised courseware

In introducing new courseware to training and learning, most designers might ponder if they should build their own courses or make provisions for off-the-shelf courseware. Inthanon and Wised (2024) define customized digital environments as those specifically engineered to meet the unique linguistic goals and diverse needs of a target learner group, contrasting with the rigid structures of OTS materials. On the other hand, off-the-shelf (OTS) courseware is a programme usually sold by a third party and comprises specific skills and programs that are set and adjusted beforehand to facilitate its usage (Inthanon & Wised, 2024). OTS courseware typically imposed limited or a lack of flexibility for the instructors to modify the program to their own targeted audience.

Customised courseware has a huge array of benefits and significance. The biggest plus point of designing one's own courseware is that the outcome or result would go the way one wants it to be. In other words, instructors can ensure a meaningful learning experience through their customised courseware toward the goals they set, and they do not blindly follow the activities that the majority of OTS courseware has already preset (Inthanon & Wised, 2024). Furthermore, customised courseware guarantees a better fit, enabling learners to produce results that meet the expectations of designers or instructors. This courseware is tailored to its specific audience, addressing what is sufficient for their learning and identifying what is suitable or should be removed.

Research by Zakaria and Yunus (2020) showed how crucial the idea of personalized educational materials could be. They pointed out that most of the courseware available in the market is not really designed to meet the needs of Malaysian learners in particular. Their research revealed that when the instructional media were custom-developed, digital learning materials that were tailor-made were the ones to really carry out the grammar teaching and accuracy achievement aspects better. Besides that, it was the customized materials that were able to exceptionally motivate the learners and result in a lot higher level of improvement as they were able to tackle the very specific points of grammatical indulgence. Really, other aspects of the responsibility of teachers must also be taken into consideration. Lim and Kessler (2024) put forward the idea that teachers should not be content with just being instructors but also take on the role of instructional courseware designers. They reason that since teachers have the most direct and ongoing contact with learners, they are exactly the ones who can come up with the most effective ways of helping students learn a language by making or modifying courseware that will address their students' needs in the best way (Umar & Aziz, 2024). When teachers come up with ways to create courseware content, it turns the act of learning into something students can really connect with, which not only raises their level of engagement but also leads to better results, mainly with getting over the shortcomings of the interface and instructional design of OTS courseware. That means school management should definitely consider setting aside time and resources for teacher training as a first and very important step in the direction of preparing them for this significant challenge of the modern-day classroom.

Ajani et al. (2022) have highlighted that off-the-shelf (OTS) products are sometimes too inflexible and do not possess the instructional flexibility requirements that can be the norm for handling mostly the way content is arranged and presented in second language learning contexts. So, it is very likely that new learners will not enjoy

the generic materials, which will eventually hinder not only effective second language acquisition but also the learning process if the media presentation is not appropriately designed (Intiana et al. 2024). Thanks to thoughtful initiatives such as the Smart Schools Project in 1998, which aimed at supplying interactive courseware to the Malaysian schools as one of the ways to popularise computer usage in the classrooms, the country is now better equipped with electronic resources for learning. Yet, digital teaching and learning tools have always struggled to reach their fullest integration inside the classrooms. Hasumi and Chiu (2024) seem to agree that most interactive courseware that is made readily available for teaching has very poor instructional design since it fails to give adequate consideration to the end users' interests, preferences, and different levels of access to technology. Because these resources do not really focus on the learners at the local level and what their current needs and abilities are, instructors have frequently resorted to falling back on familiar or localised traditional printed textbooks for teaching and learning (Bakir & Aziz, 2022; Din & Yamat, 2020).

Therefore, customisable courseware helps learners succeed and enables colleges and universities to deliver a more personalised learning experience that engages learners in the learning process. Courseware with a mobile-friendly interface allows learners to access course materials, ensures learners are supported, achieves positive results, and provides insightful analytics on learner performance.

Personalised learning applications

The integration of personalised learning and technology has been extensively explored in various studies, consistently demonstrating positive outcomes. Research, for instance, has shown that learners within a personalised learning environment achieve superior academic results and foster social growth through personal development (Abbas & Ayaz, 2025). Building on this, Wang & Sun (2025) proposed a specific model for personalised learning leveraging mobile technologies. Their findings underscore that e-learning personalisation is critical in this domain, necessitating consideration of learning style, learning interest, and learner devices. By incorporating these elements, their new model for personalised courses successfully provided a better understanding of their learners.

Furthermore, a recent study by Jarrah et al. (2023) analysed the effectiveness of adaptive digital environments and demonstrated that AI-powered personalised learning significantly outperforms conventional methods in the ESL context. This superior performance is achieved through a dynamic learner model that facilitates a circular process involving personalised learning style analysis, performance prediction, and real-time intervention. Because this learner model is inherently iterative, students continuously improve their skills, leading to better grades and a deeper understanding of grammatical structures over time. By comparing an experimental group using these adaptive tools with a control group using traditional methods, the researchers documented that the experimental group achieved statistically significant gains in post-test scores, with data indicating that AI-driven personalized learning can lead to a 25% improvement in grammar accuracy and a 40% increase in vocabulary retention.

Collectively, these studies exemplify how personalized learning, when incorporated with technology, effectively improves and facilitates the learning process.

In terms of established structures, the Personalized Learning Framework based on the school curriculum in the United Kingdom, as detailed by Hopkins (2004), comprises five main components. These components include assessments for learning that account for individual strengths and weaknesses, allowing for the tailoring of educational approaches to meet diverse student needs. Next, effective teaching and learning strategies must develop competence, instil confidence, and accommodate different learner paces, which can include differentiated instruction, collaborative learning opportunities, and the use of technology to support individual learning needs. The third component is curriculum entitlement and choice, ensuring the curriculum offers a wide range of studies and flexible learning pathways. Furthermore, schools implementing personalization must adopt a learner-centred approach in their organisation. Lastly, the framework emphasizes strong partnerships beyond the school, involving parents and the community in supporting student well-being.

Complementing this, Redd's (2011) personalized learning model, specific to educational technology, highlights four essential elements central to personalized learning: learning objectives, student data, learning content, and assessment.

While these personalized learning frameworks and models utilize different terminology, they share common features—specifically flexibility, pace, learning style, learning content, student data, and assessment—which this study will incorporate into the development of PLaCE.

Application of Mayer's Multimedia Learning in Producing A Grammar Courseware

In view of the success demonstrated in numerous studies and the continuing advancement in the technology, more and more teachers are incorporating multimedia into their classroom instruction (Godsk et al., 2025; Mayer, 2024; Truss et al., 2024; and Noetel et al., 2021). Multimedia courseware is becoming an essential tool for teaching purposes. This is because it could combine and develop from a variety of media and target specific users and purposes. It has a number of potentials for both learners and teachers. For example, learners who have problems in understanding a specific unit of study or find it difficult to grasp a concept would benefit from using the courseware as an independent teaching tool. Apart from that, the courseware can also be used as a self-paced educational tool. Since learners learn and develop at different rates, the multimedia courseware allows learners with different learning styles to work at their own pace. Not only that, but multimedia courseware is also reusable, updateable, and transportable. The common format for multimedia courseware is compact discs (CDs), as they offer a structure for learning in a non-linear environment.

Mayer and Clark (2023) propose some principles for using multimedia in the design of online courses based on cognitive learning theory. They recommend using text and graphics instead of just text (multimedia principle), putting text and corresponding graphics together (continuity principle), presenting the text as audio narration instead of on-screen text (modal principle), avoiding external sounds (coherence principle), avoiding the simultaneous presentation of words in text and audio narration (redundancy principle), and using conversational and virtual coaching (personalisation principle). However, it is suggested that these suggestions may change depending on the training objectives, the prior knowledge of the trainees, the training implementation environment, and the specific learning outcomes desired for the course.

According to Mayer's generative theory, this is a cognitive psychology theory of information processing. Multimedia learning provides information to students through different modes such as visual and auditory (Mayer, 2001). Mayer's theory is based on Paivio's (1990) double encoding theory, which states that words encoded in two modes are learnt better than words encoded in only one mode. Paivio's dual coding theory is supported by research by Dong et al. (2021), who found that the learning effect is best when the input of the new language is noted both visually and verbally. In addition, the multimedia environment takes into account individual differences in learning preferences by providing students with the choice between different modes of information that are made engaging through fun activities supported by sound, vision, animation, and video, which can enhance their understanding and retention of the new language being learned.

The application of Mayer's multimedia is needed and very important in the production of courseware that can help learners in learning grammar in the best way and effectively. Multimedia learning theory aims to aid learners in learning more effectively by organising multimedia teaching methods that employ more effective cognitive methods (Heng & Said, 2020). Thus, it shows that the application of Mayer's multimedia in producing the grammar courseware will bring many benefits to the learner, and it surely can help them to increase their knowledge of English grammar.

First, the application of Mayer's multimedia learning in producing grammar courseware provides users with a greater variety of ways to learn. Baharudin, Zulkifli, and Yunus (2019) stated in an article that learners can watch a movie, read a narrative book, play an educational game, or watch and listen to instructional videos using multimedia in various ways. The words might be shown on a screen or spoken aloud as a narrative. The images might be either static or animated. Charts, graphs, diagrams, and illustrations are examples of static images. Interactive animations and videos are examples of animation images (Truss et al., 2024). These statements show the various ways of learning that Mayer's multimedia learning offers, for example, videos, pictures, games, etc.,

that can help learners to learn English grammar in a variety of strategies, approaches, or techniques. If there are various ways to learn something, there will be fewer challenges and disadvantages for learners in mastering English grammar.

Second, producing grammar courseware with the appliance of Mayer's multimedia learning will motivate learners to learn grammar by making the process of learning more enjoyable and engaging. As stated in an article by Baharudin et al. (2019), it is necessary to use multimedia in literature instruction to capture students' interest and motivate students to study and read the literature. Productive instructional multimedia pieces should include detailed graphics and narratives that contribute to the key aspects of the lesson and illustrations to draw the learner's attention to the main concepts of the lesson (Rudolph, 2017). Therefore, it is crucial to attract learners' attention and interest, thereby motivating them to engage fully in learning grammar, which is often perceived as boring.

Lastly, the most important benefit of Mayer's multimedia learning in producing grammar courseware is that it helps learners understand the material and expand their knowledge more effectively. Video may assist people in better understanding literature and maximizing their attention span. The use of video increases students' retention and comprehension of the literature they receive in class (Baharudin et al., 2019). Based on research conducted with a group of students, the results show that almost all participating students performed better and improved their test scores after using multimedia compared to when they did not use multimedia in their lessons. These have provided clear evidence that applying Mayer's multimedia learning is crucial for producing grammar courseware, enabling learners to achieve maximum understanding of English grammar and ensuring their proficiency in it.

Personalized Learning Courseware (PLaCE) Design Specifications

The instrument developed in this study is specifically designed and tailor-made for Language Enrichment/ Preparatory College English, in the form of a CD-ROM known as Personalized Learning Courseware (PLaCE). It is developed as a tool to enhance learners' understanding of grammar. According to Abhishikta et al. (2025), grammar plays a crucial role in one's reading comprehensiveness, as well as their ability to speak competently in the English language. She further asserted that the absence of knowledge and skills in grammar would interfere with the level of reading comprehension among learners. The author further pointed out that in past research, second language learners' comprehension in reading English could not only be determined and predicted through the complexity of the text the learners are reading but also through the grammar and ability to properly acquire high reading comprehension skills (Abhishikta et al. (2025).

Frederick (2015) stated that, in a professional context, grammar plays an important role as a tool of proper communication in the workplace. In primary and secondary education, educators teach learners the fundamentals of grammar. They learn how to use punctuation and conjugate verbs in sentences, as well as to think critically. However, the emphasis on grammar has now shifted to a new situational paradigm. Grammar allows a learner to communicate fully and professionally verbally and in writing. Proper usage of grammar demonstrates a level of intelligence that is essential for both speaking and writing effectively. Grammar provides a learner with organisation of words that create critical ideas and information, and without it, they would prove to be less convincing to the professional world (Dominguez Arellano, 2025).

Therefore, it is evident that grammar significantly contributes to a learner's level of knowledge and skill development. For this reason, PLaCE is developed to aid learners in improving their grammar. The general process described in this chapter can be applied to other areas of technology education. There is a certain structure one has to follow when developing multimedia courseware for academic purposes. The process can vary slightly according to the educator's style; however, the basic concepts follow the basic rules and principles of ISD. The principles behind the development of the material accord with those acknowledged by Hemard (2006), whereby he stipulated that activities must not only be useful and meet learners' needs but also be sufficiently enjoyable to be accessed outside the classroom. The material exploits authentic classroom lectures and seminars (constructivist learning theory) and adopts a communicative approach to consolidate the learners' skills in the development of using grammatically correct structures in an academic context. The PLaCE on CD-ROM is the first of its kind to enhance learners' skills in using grammatically correct structures in academic

contexts. It combines audio, video and textual information within the context of a real tutoring situation to enable learners to develop reflectivity and flexibility when mediating a miscue. The PLaCE CD-ROM` materials and design specifications used in this study are described in the following Table 1.

Table 1 Summary of the Instructional Events and The Manifestation in PLaCE

Element of Gagne's Nine Events of Instruction	Guidelines for implementation	Manifestation in PLaCE CD
Create an attention-grabbing introduction	gain the attention of every learner.	This is done by using attractive graphics, texts, visual and audio effects.
Inform learner about the objectives of the course	- state clearly the goals of the course. - Why they need to actively participate in the course. - tie it into real-world applications and benefits.	Learning outcomes are clearly stated at the main page of the PLaCE CD content. It identifies what the learners will know and be able to do by the end of the course which is Language Enrichment/Preparatory College English.
Stimulate recall of prior knowledge	Recall and apply knowledge they have previously acquired gives online learners the chance to commit it to long-term memory.	7 tenses that are covered in this course are shown in the introductory page. Explanation of the usage is given for each tense and verbal and visual explanations are provided too.
Create goal-centered content	- tie in directly to the goals and objectives of each and every e-learning activity, online exercise, and piece of e-learning content. - use a variety of media if possible, including text, graphics, audio narration, and video.	- Each unit has its objectives stated on top for learners to read and understand. - Exercises provided are authentic and similar to the examination format. The explanation of the tenses could be viewed via written context and YouTube video to cater for different learning styles.
Provide online guidance	Create support/coach to develop favourable online learning behaviours.	In providing learner guidance, hints and cues are provided using embedded links.
Offer timely feedback	give learners timely and constructive feedback - improve learning behaviors and identify their weaknesses and strengths.	Formative feedback is provided once learners have completed the entire six reading passages. It is given in the form of correct (/) and wrong (X). The learners could also view their score, which is over 30 marks.
Assess performance	Retrieve and reinforce content as a final evaluation.	Learners screenshot their scoring page and keep a copy in their profile for submission.
Enhance transfer of knowledge by tying it into	include real-world scenarios, stories, and other interactive e-learning activities that show them	Practising and completing all exercises provided in PLaCE CD.

real world situations and applications	the applications of the information and skills they've worked so hard to develop.	
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Research Question and Hypotheses

What is the effect of PLaCE on learners' performance in Language Enrichment and/or Preparatory College English?

In this research question, the hypotheses below were examined:

1. paired sample t-test of the control group learners comparing pretest, posttest and Test 1.
2. paired sample t-test of the experimental group learners' comparing pretest, posttest and Test 1.
3. an independent sample T-test comparing the control group learners and experimental group learners on their pretest, posttest and Test 1 scores.

METHODOLOGY

Research Design

This study adopts an experimental research design (pretest-posttest two-group design) (Shadish, Cook, & Campbell, 2002), which is intended to establish empirical evidence showing the influence of personalised instructional technology courseware on learners' success. The independent variable was the use of PLaCE and the dependent variable was the students' grammar performance.

The main study involved a total of 174 ESL learners from UiTM Shah Alam. Participants were selected using a purposive sampling method and were assigned to either the experimental group (n=94) or the control group (n=82). The demographic profile of the participants included semester 1 students with ages ranging from 18 to 20 years old from social sciences and science and technology faculties. All participants shared a similar English proficiency level, having scored a Band 3 in their Malaysian University English Test (MUET).

The development of PLaCE closely follows the principles of Mayer's multimedia theory and Instructional System Design (ISD) model, namely Gagne Nine Events of Instruction and the language contents used in PLaCE are based on the Course Syllabus of Language Enrichment/ Preparatory College English. To further validate and verify the contents and exercises used, three subject matter experts (language lecturers at APB) were consulted. A previous Test 1 examination paper was used as the pretest and posttest. All these examination papers were validated and verified by the resource person (RP) and the Testing and Evaluation Committee (TEC), Akademi Pengajian Bahasa (APB), UiTM Shah Alam. To further ensure content validity, the questionnaire used in this study was established by pilot testing the instrument with 22 people: 2 e-learning lecturers and 20 learners in UiTM Shah Alam. Reliability analysis was also used to test the reliability of the Likert scale questionnaire, as it is necessary prior to conducting any statistical analyses. The value of Cronbach's Alpha was < 0.70 , which was acceptable.

During the intervention phase, which lasted for 14 weeks, the experimental group utilised the PLaCE courseware to learn grammar, while the control group received traditional face-to-face instruction covering the same syllabus. Both groups were administered the validated pretest prior to the intervention and the posttest immediately following the completion of the syllabus.

Null Hypotheses

Ho1: There is no significant difference in the control group learners' pretest-posttest score.

Ho2: There is no significant difference in the control group learners' pretest-test 1 score.

Ho3: There is no significant difference in the control group learners' posttest-test 1 score.

Alternative Hypotheses

Ha1: There is a significant difference in the control group learners' pretest-posttest score.

Ha2: There is a significant difference in the control group learners' pretest-test 1 score.

Ha3: There is a significant difference in the control group learners' posttest-test 1 score.

The null and alternative hypotheses above were investigated. The hypotheses tested the learner's performances in the control group by using a pretest, posttest and Test 1. The alpha level of significance was set at .05. The sample size of the control group was 82. For the region of rejection, the study rejected the null hypotheses if $p < .05$.

Table 1 shows the statistical analysis of the control group. A paired sample test was conducted as the same respondents sat for the pretest, posttest and Test 1 to examine the significance of the mean. Comparisons between the mean and standard deviation of the pretest, Test 1 and posttest are presented.

Table 1 Paired Sample T-Test of the Control Group Learners Comparing Pretest, Posttest and Test 1

	Paired Differences		t	df	Sig. (2-tailed)
	Mean	Std. Deviation			
Pre_test – Post_test	3.50	4.48	7.07	82	.00
Pre_test - Test_1	.34	4.64	.67	82	.50
Post_test -Test_1	3.16	.49	6.37	82	.00

Referring to Table 1, a paired sample T-test was run on the pretest-posttest, pretest-test 1 and posttest-Test 1. The pretest and posttest mean ($\bar{x}$) is 3.5 with a standard deviation (SD) of 4.48, conditions $t(82)=7.07$, $p=0.00$. Since the p-value is 0.00, ($0.000 < \text{less than the } p\text{-value } 0.05$), the null hypothesis is therefore rejected in favour of the alternative hypothesis. Hence, there is a significant difference in the pretest and posttest scores taken by the control group.

As for pretest-Test 1, the mean ($\bar{x}$) is 3.5 with a standard deviation (SD) of 4.64, conditions $t(82)=0.67$, $p=0.50$. Since the p-value is 0.50, ($0.000 > \text{more than } p\text{-value } 0.05$), the null hypothesis is failed to reject. Therefore, there is no significant difference in the pretest and Test 1 scores taken by the control group.

In the posttest-test 1, the mean ($\bar{x}$) is 3.16 with a standard deviation (SD) of 0.49, conditions $t(82)=6.37$, $p=0.00$. Since the p-value is 0.00, ($0.000 < \text{less than the } p\text{-value of } 0.05$), the null hypothesis is therefore rejected in favour of the alternative hypothesis. Hence, there is a significant difference in the pretest and posttest scores taken by the control group.

The next section exhibits the null hypotheses and alternative hypotheses for the paired sample t-test of the experimental group learners' comparing pretest, posttest and Test 1.

Null Hypotheses

Ho1: There is no significant difference in the experimental group learners' pretest-posttest score.

Ho2: There is no significant difference in the experimental group learners' pretest-test 1 score.

Ho3: There is no significant difference in the experimental group learners' posttest-test 1 score.

Alternative Hypotheses

Ha1: There is a significant difference in the experimental group learners' pretest-posttest score.

Ha2: There is a significant difference in the experimental group learners' pretest-test 1 score.

Ha3: There is a significant difference in the experimental group learners' posttest-test 1 score.

The null and alternative hypotheses above were investigated. The hypotheses tested the learner's performances in the experimental group by using a pretest, posttest and Test 1. The alpha level of significance was set at .05. The sample size of the experimental group was 94. For the region of rejection, the study rejected the null hypotheses if $p < .05$.

Table 2 shows the statistical analysis of the experimental group. A paired sample test was conducted on the experimental group learners who sat for the pretest, posttest and Test 1 to examine the significance of the mean. Comparisons between the mean and standard deviation of the pretest, posttest and Test 1 are presented.

Table 2 Paired Sample T-Test of the Experimental Group Learners' Comparing Pretest, Posttest and Test 1

Experimental group	Paired Differences		T	df	Sig. (2-tailed)
	Mean	Std. Deviation			
Pre_test - Post_test	4.45	4.74	9.10	94	.00
Pre_test - Test_1	4.21	4.18	9.78	94	.00
Post_test - Test_1	.23	4.39	.52	94	.61

In Table 2, a paired sample T-test was run on the pretest-posttest, pretest-test 1 and posttest-test 1 of the experimental group. The pretest and posttest mean ($\bar{x}$) is 4.45 with a standard deviation (SD) of 4.74, conditions; $t(94)=9.10$, $p=0.00$. Since the p-value is 0.00, ($0.000 < \text{less than the p-value of } 0.05$), the null hypothesis is therefore rejected in favour of the alternative hypothesis. There is a significant difference in the pretest and posttest scores taken by the experimental group.

In the pretest-test 1, the mean ($\bar{x}$) is 4.21 with a standard deviation (SD) of 4.18, conditions; $t(94)=9.78$, $p=0.00$. Since the p-value is 0.00, ($0.000 < \text{less than the p-value of } 0.05$), the null hypothesis is therefore rejected in favour of the alternative hypothesis. Hence, there is a significant difference in the pretest and posttest scores taken by the experimental group.

As for posttest-test 1, the mean ($\bar{x}$) is 0.23 with a standard deviation (SD) of 4.39, conditions; $t(94)=0.52$, $p=0.61$. Since the p-value is 0.61, ($0.000 > \text{more than the p-value of } 0.05$), the null hypothesis is failed to reject. There is no significant difference in the posttest and Test 1 scores taken by the experimental group.

The following null hypotheses and alternative hypotheses investigate an independent sample T-test comparing the control group learners and experimental group learners on their pretest, posttest and Test 1 scores.

Null Hypotheses

Ho1: There is no significant difference between the control group and experimental group learners in their pretest score.

Ho2: There is no significant difference between the control group and experimental group learners in their posttest score.

Ho3: There is no significant difference between the control group and experimental group learners in their Test 1 score.

Alternative Hypotheses

Ha1: There is a significant difference between the control group and experimental group learners in their pretest score.

Ha2: There is a significant difference between the control group and experimental group learners in their posttest score.

Ha3: There is a significant difference between the control group and experimental group learners in their Test 1 score.

The null and alternative hypotheses above were investigated. The hypotheses tested the learner's performances in the experimental group by using a pretest, posttest and Test 1. The alpha level of significance was set at .05. The sample size of the control group was 82, while the experimental group was 94. For the region of rejection, the study rejected the null hypotheses if $p < .05$.

In the current research study, the variable of learning performance was measured by a pretest, a posttest and Test 1. Table 3 shows the statistical analysis for the control and experimental groups. Comparisons between the means of the control and experimental groups are presented. An independent sample t-test was run to examine the significance of the mean differences between the control and experimental group learners.

Table 3 An Independent Sample T-Test Comparing the Control Group and Experimental Group Learners on Pretest, Posttest and Test 1

	Group	N	Mean	Std. Deviation	t	df	Sig. (2-tailed)
Pretest	Control	82	15.46	4.81	-1.01	176	.32
	Experimental	94	16.17	4.52			
Posttest	Control	82	18.96	4.43	-2.57	176	.01
	Experimental	94	20.62	4.10			
Test 1	Control	82	15.80	3.99	-8.53	148.40	.00
	Experimental	94	20.38	2.98			

In the pretest between control and experimental groups, the control group mean ($\bar{x}$) is 15.46, standard deviation (SD) of 4.81, conditions; $t(176) = -1.01$, $p = 0.32$. The experimental group mean ($\bar{x}$) is 16.17, and the standard deviation (SD) of 4.52, conditions; $t(176) = -1.01$, $p = 0.32$. Since the p-value is 0.32, ($0.000 > \text{more than the p-value of } 0.05$), the null hypothesis is failed to reject, as there is no significant difference in the pretest between the control and the experimental group learners.

As for the posttest score between control and experimental group learners, the control group mean ($\bar{x}$) is 18.96, standard deviation (SD) of 4.43, conditions; $t(176) = -2.57$, $p = 0.01$. The experimental group mean ($\bar{x}$), however, is 20.62, with a standard deviation (SD) of 4.10, conditions; $t(176) = -2.57$, $p = 0.01$. Since the p-value is 0.01, ($0.000 < \text{less than p-value } 0.05$), the null hypothesis is therefore rejected in favour of the alternative hypothesis. There is a significant difference in the posttest between the control and the experimental group learners.

Next, in Test 1, the control group mean ($\bar{x}$) is 15.80, standard deviation (SD) is 3.99, conditions; $t(148.40) = -8.53$, $p = 0.00$. The experimental group mean ($\bar{x}$) is 20.38, and standard deviation (SD) of 2.98, conditions;

$t(148.40) = -8.53, p = 0.00$. Since the p -value is 0.00, ($0.000 < \text{less than } p\text{-value } 0.05$), the null hypothesis is therefore rejected in favour of the alternative hypothesis. Hence, there is a significant difference in Test 1 between the control and the experimental group learners.

DISCUSSION AND CONCLUSION

In the above research question, learners' academic performances were measured using pretest, posttest and Test 1. Findings in Table 1 reported when a paired sample t -test of the control group learners' pretest-posttest was run, there was a significant difference between the two tests' mean ($\bar{x}$) of 3.5. This indicates that learning does take place via traditional classroom learning, i.e., face-to-face. However, in the pretest – Test 1, there was no significant result, which means although learning takes place in a traditional setting, it did not show or reveal better performance by the control group learners. Again, in the posttest – Test 1, there was a significant difference shown in the result with the mean ($\bar{x}$) of 3.16. This disparity is due to the fact that the learners were exposed to the same question set used by the researcher. This is supported by Price, Jhangiani, and Chiang (2015), who claim that learners have matured between the pretest and posttest as they are growing and learning; hence, learners could memorise and remember the same given question.

However, in Table 2, a significant difference was observed for the experimental group learners. In other words, the results indicate a significant improvement in the learners' achievement from their pre-test and post-test scores after using the drill and practice courseware. This means that the learners have improved their knowledge after using the intervention. Thus, it proves that the PLaCE given to the experimental learners helps them do well in their tests.

Further analysis was made between the control group and the experimental group. Based on the independent sample t -test, there was a significant difference in the learners' performance as an overall score in Test 1 between the control group ($M=15.80, SD=3.99$) and the experimental group ($M=20.38, SD=2.98; t(148.40) = -8.53, p = .00 < .05$). Hence, the null hypothesis, H_0 , was therefore rejected in favour of the alternative hypothesis, H_a , as mean posttest and Test 1 scores were significantly different between the results of the control group using only traditional instruction and the experimental group using both traditional classroom instruction and PLaCE CD continuously throughout the duration of the research study. The mean for the control group was 15.80 while the mean for the experimental group was 20.38. Thus, the learners in the experimental group outperformed those in the control group by an average of 4.58 points. This finding also indicates that the learners in the experimental group improved their learning by utilising the interactive courseware, which is PLaCE. They could repeatedly do the exercises in PLaCE until they have mastered the grammar. The post-test result indicated a significant difference because the control group were drilled by their class lecturers/instructors using the previous test papers. Thus, the chances of the learners getting the same test paper as the researcher used for the pre-test and posttest are very high. On the other hand, the control group did not do well in Test 1, revealing that traditional teaching without the use of "other" technologies in the learning process would not yield effective results. The findings align with recent research studies like Shadiev and Yang (2020), Lim and Aryadoust (2021), Goksu et al. (2022), and Zhang and Zou (2022), among others, who have thoroughly confirmed the effectiveness of using computer-assisted and technology-enhanced tools in language learning.

The above findings indicate that personalised learning courseware, i.e., PLaCE, has a potential role to boost and stimulate learners' accomplishments in enhancing the learners' performance. It increments learners' interest in instructional activities more than the normal conventional classroom (Wu, 2014), leading to improved engagement and better academic outcomes as learners become more actively involved in their education. In English language lessons, interaction is a fundamental element in learning outcomes. In any case, interaction in the conventional classroom was limited to one direction, from the educator to the learners. By and large, in this sort of lesson setting, learners wait for the educator to involve them in discussing questions and answers (Schwienhorst, 2008). Including a component of instructional innovation in the conventional classroom environment, it can give the opportunity for learners to get instruction utilising different strategies to engage numerous senses for learning to be meaningful (Mayer, 2019). Moreover, research conducted about the ways American Indian learners learn (Bergstrom, Cleary, and Peacock, 2003) claims that learners thrived when

instructors utilised numerous approaches. Likewise, utilising instructional methodologies has a significant impact on the learners' engagement and determination (Pletka, 2007).

According to Ajani et al. (2022), OTS solutions are often too rigid and lack the necessary instructional flexibility to handle specific learning content. PLaCE offers content that is specifically meant for English Enhancement and/or College Preparatory English (BEL403 /BEL411). The way the content is presented with media components, such as animations, videos, and graphic animations, enables it to communicate the information to the target audience. Using media engages learners, aids their retention of knowledge, motivates their interest in the subject matter, and illustrates the relevance of many concepts. Thus, it can be used to enrich learners' learning process by making the educational experience more interactive and enjoyable, ultimately leading to better learning outcomes. Kahu, Nelson, and Picton (2017) posit that for learners to have a positive learning experience, it matters not only how much they learn but also how interesting, enjoyable, and easy they find the process of learning.

Hence, the courseware PLaCE gives many benefits to the learners. It provides a real-life situation for the learners to utilise language structure rules in a natural, real-world setting. The PLaCE engaged the learners interactively since they could listen, compose, and coordinate them with pictures, and at that point, a review of exercises made a difference for them to memorise in long-term memory. Tentatively, learners who utilised the language courseware were able to manipulate the answers and arrange to understand the content. Immediate feedback from the courseware gives them an opportunity to interact more viably based on the lesson goals. The courseware displayed the learners' mistakes, helping them correct these by considering the time spent on them. Such feedback is an important element because every individual is capable of constructing his/her own knowledge by interacting with the tasks without spending too much time and fearing failure (Greany, 2007). By observation during the experiment, the learners in the experimental group were more independent from their teacher, and they were more centred in interacting with the learning environment. Learners in this group seem to focus on practising using the multimedia language courseware by integrating words, sounds, and pictures for meaningful learning. In fact, they were able to further practise achieving authentic learning based on their needs, interests, and opportunities to choose different types of activities. The language courseware changes the process of learning and shifts it to be less boring and more attractive compared with a conventional textbook, thereby enhancing engagement and motivation among learners. This is in line with Inthanon & Wised (2024) and Coley's (2016) notions on the importance of customised courseware for learners.

The study concludes from the literature review that personalised learning courseware has the potential of making strides in the learners' performance in distinctive language abilities and plays a part as a catalyst in language learning. By learning the English language using personalised interactive courseware, a two-way interaction between learners and the courseware would make learning end up more reciprocal, interesting, and significant. Learners would be active since they are required to respond to the exercises given, which encourages engagement and reinforces their understanding of the material. In other words, the PLaCE CD has been utilised as a vehicle for conveying instructional materials to learners adequately (Alisoy, 2025). In addition, the PLaCE CD allowed learners to review materials as often as necessary and at their pace, and this likely enhanced learning performance.

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