

Cognitive Theory of Multimedia Learning Powered Code-Switching Interface for Vocabulary Acquisition of ESL Students

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Abstract—The purpose of the paper is to use multimedia as a method to improve proficiency in vocabulary of undergraduate students from the level B1 to B2 (CEFR). The term "code-switching" is used to describe the use of multiple languages during a single discourse. Human minds can take in so much data before they get overwhelmed. The quality of that limited space can be improved by incorporating visual attention alongside verbal attention in order to create mental representations that are utilised to digest incoming information. "People learn more deeply from words and pictures than from words alone" (Mayer, 21). This research builds on previous work in this area by making use of multimedia materials that feature both the learners' native language and English subtitles. This creates mental space for the students, which in turn guides them to a vocabulary-learning interface. CTML was employed to conduct a quantitative study between the age groups 17 and 20. Using a random sampling technique, researchers collected data from a total of 40 individuals. ANOVA (Analysis of Variance), independent t-tests, and paired t-tests were used to examine the use of Code-Switching in the experimental group and its statistical significance relative of the control group. The findings of the study suggest that utilising CTML can help non-native speakers of English improve their language through code-switching. There was a significant advancement in the vocabulary usage of the experimental samples of those who participated in the study.

Index Term—vocabulary, Code-Switching, CTML, long-term memory, mother-tongue

I. INTRODUCTION

Language is widely misunderstood as a subject to be learnt and the process of learning is made poignant and pesky as days go by. It is evident that the educational curriculum is failing the system miserably as we observe the downfall among students while expressing any language. As long as a child is in the comfort of the parents, it tends to evolve due to their immense care. When a mistake is committed, it is rectified on account of realisation. The rules in life are not embedded in a book to be followed, but it is practised. Language is a component of lifestyle, and it cannot be acquired merely from a book but through consistent practice.

Language acquisition is about "what is being said rather than how" (Krashen, 1984). It does not fall under a certain rule to be obliged. But learning, on the other hand, works on a structure. Language is being used widely everywhere and hence there are several ways to acquire it. Like learning, acquisition needs a structure to create an order and to eliminate unwanted factors that influence the process. In this paper, the researcher discovered a well-renowned practice of the language acquisition process and enhanced it according to social needs. People nowadays expect everything to be fast. They do not wait for anything longer than their anticipated time. Considering such time-conscious needs, it might be rather difficult for language teachers to follow conventional methods of teaching the language. Researchers around the world come up with new approaches and methods of teaching now and then, and among such endeavours, the researcher of this paper has opted for one of the innovative terminologies called CTML. Understanding and acquiring language via online teaching has always faced hardship when it comes to teacher-student interaction, the distance factor has affected the interaction quality and many educators are resorting to using linguistic choices that indirectly propagate distancing in the online classroom (Chintalapalli, 2021).

Cognitive Theory of Multimedia Learning (CTML) was primarily coined by Mayer. R.E. in the year 2014. A vital proposition that supports the research on multimedia learning is the fact about how the human mind works, and meaningful learning is associated with it. The three scientific principles of the Cognitive Theory of Multimedia Learning are dual-channel assumption, limited-capacity assumption, and active processing assumption. This paper entails the application of CTML in a movie with respect to its visual and auditory processing (DCT). Considering the

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broader audience with reference to the mother-tongue as a demographic variable, Code-Switching is applied to the research to ensure that the auditory process in the research is taken over by the mother-tongue.

Code-Switching is the natural conflict between two languages in course with delivery within a sentence. A terminology to give a reason for habitual expression is turned into a tool for acquiring vocabulary through movies. The course of moving back and forth between two languages is employed in association with cognition in multimedia learning. Before engaging in Code-Switched language learning, it was considered a subject of controversy. Although it is performed automatically and unconsciously, it serves a number of important purposes. "Teachers employ code-switching strategy as a means of providing students with opportunities to communicate and enhance students' understanding" (Modupeola, 2013). It also helps create a relaxed classroom setting where teachers do not have to strain their nerves to find a way to explain complex concepts in simple terms. CTML acts as an inducer of Code-Switching in this research.

Research Question

RQ1: Can non-native English speakers adopt Code-switching to learn new vocabulary?

RQ2: Can Code-Switching use CTML to teach vocabulary?

RQ3: Can Code-Switched subtitles help learners acquire new vocabulary?

II. LITERARY BACKGROUND

A. *Why Code-Switching?*

English has always been immigrant in most cases in an ESL classroom. A non-native learner finds it challenging to shift completely to the English language in the process of learning. Code-Switching enables learners to relish the language learning process due to their capability to grasp their teachers' input (Modupeola, 2013). As the experiment switches between codes, the objectives of the experiment draw the learners gradually. Code-switching helps students start in a comfortable place and move confidently into uncharted territory. It helps learners to relate to the experiment content much more efficiently as the mother-tongue has a prime involvement in the method. There are some drawbacks irrespective of their profound nature. If the learners do not share the same mother-tongue, Code-Switching does not function effectively. The other students who do not share the language in the experiment would feel left out in the process (Cook, 2002). With its arguable phenomenon, Code-Switching can be viewed for its pros and cons and considering that the research has explored a new area to make the best use of Code-Switching. On a brighter note, it is supposed to tie the teaching and learning process (Üstunel, 2016). Even though English as a Foreign Language (EFL) classroom requires an English-only environment, native speakers are encouraged to use their mother-tongue in class (Paradowski, 2008). In a classroom, teachers may find the students quite confused about certain learning materials. Code-Switching allows educators to seamlessly transition between languages when presenting new content (Uys & Dulm, 2011). Code-Switching not only benefits the trainers but also the trainees in terms of comfort and emotional connectivity. Whether in conversation with teachers or co-learners, Code-Switching acts as a key to avoiding miscommunication, but clarifying their uncertainties (Moore, 2010). Allowing the use of the mother-tongue will help the learners comprehend the lesson, which will, in turn, help them gain confidence and answer any questions. This practice will help them avoid mistakes (Wilang, 2021).

Video is changing the way we learn. The use of video in the classroom has been shown to increase students' learning efficiency (Ljubojevic et al., 2014). Both spoken and written languages originate in Wernicke's region, located on the left side of the brain. But the right half is liable for the emotional expression of language. Video-based instruction engages the student's entire brain, including the rational and intuitive parts of the mind, thus leading to enhanced learning. While the potential for profound and lasting learning has always been present, traditional teaching methods have never made use of the right brain's capacity. The widespread use of instructional films has countered this trend (Clare, 2017).

B. *Dual-Coding Theory*

In 1971, Allan Paivio put forth the Dual-Coding theory to describe the significant influence of the mental imagery on cognition and memory. After initially applying Paivio's idea to the study of memory, researchers have begun to extend it to other areas of cognition (Paivio, 1987). Conferring to this principle, an individual can acquire new information by either verbal connotations or visual imagery alone, but the amalgamation of the two is more efficient (Reed, 2012). The dual-coding theory proposes that the mind stores information in a way that combines language and visual cues. However, the human mind processes this data in two separate channels, each of which results in a unique representation of the data it takes in. There are now two primary coding systems in use: the verbal system and the visual system that come under the non-verbal category. Because of the mutual influence of these two encoding schemes, memory is improved (Al Seghayer, 2001). "Logogens" are the sequential units of information that are stored in the verbal system; these can be any kind of linguistic information, from written text to spoken words to motor experience like sign language. Visual information and units, including symbols, photographs, and motion pictures, are processed and stored in the "imagens" of the non-verbal and visual systems. Both "logogen" as well as "imagen" relate to emblematic units of verbal and non-verbal data that generate mental words and images that already exist in the memory and can work automatically to enhance reasoning function. To put it another way, an imagen is a non-verbal information

representation unit, while a logogen is a spoken chunk of data (Paivio, 2014). Amid verbal and visual systems, there are three separate types of processing that can occur: representational processing, referential processing, and associative processing. Connections between the two reference systems have been made (Clark & Paivio, 1991).

One way that the brain works is through a process called "referential processing," in which one system triggers the activation of the other. The unique form of associative mutualism known as referential processing involves the activation of logogens in other systems, either by imagens that have been previously activated or vice versa. Referential links between imagens and logogens make naming feasible, and names can trigger images that are representations of information about the world. Reference processing occurs in many facets of life, from language acquisition to academic achievement to technological proficiency to the generation of original thought (Paivio, 2014). Initially dependent on recognizing linked relationships between language and material patterns, this occurs very early in the process of language acquirement, when toddlers initiate acquiring the appellations of objects, thereafter rapidly expand towards the erudition of grammar (Moeser, 1973).

In discussing representational processing, we refer to the stimulation of a verbal or visual demonstration by an impetus, which could be a word or a picture. More specifically, we are referring to the instigation of a verbal or visual demonstration by a word and a visual demonstration by a picture, respectively (Reed, 2022). The initial stage of information processing is the instantaneous initiation of imagens and logogens from stimulus patterns. This step can be thought of as a "template matching process involved in stimulus recognition" (Paivio, 2014).

The phrase "associative processing" denotes the commencement of new data inside referential systems. Visual and verbal codes that, respectively, correlate to these verbal and non-verbal demonstrations are employed to organise the inbound data which can be worked upon, amassed, and retrieved for further usage. These codes can be either spoken or seen. When trying to remember something, you have the option of using either visual or verbal cues (Paivio, 2014).

C. Cognitive Theory of Multimedia Learning

The Cognitive Theory of Multimedia Learning, or CTML, examines the way individuals acquire instructions when they are exposed to different types of multimedia (Mayer, 2001). The generative theory of Wittrock (1974) and the dual-coding theory of Paivio (1990) serve as the foundation for this hypothesis. Nevertheless, it surpasses these two conceptions by placing the onus of "actively selecting and connecting parts of visual and verbal knowledge" on the learner (Mayer, 1997). The theory backs up the impression that students make significant associations between images and words and efficiently assimilate them in long-term memory (Mayer, 2005). The learner participates more actively in the creation of knowledge in the CTML paradigm than in the DCT paradigm, which is the main difference between the two.

As a cognitive structure, the CTML process runs through three memory stores known as sensory memory, working memory, and long-term memory. Sensory memory recognises fresh information. Working memory endures the route by processing the newly acquired information. Finally, long-term memory stores the data as a knowledge base (Sweller, 2005). The representation of words and pictures is distinguished into five forms which occur as information processed by memory. In the three memory stores paradigm of multimedia learning, each form has a responsibility. The depiction of words and images in a multimedia presentation is the first form; sounds and images as acoustic and emblematic representations in sensory memory are the second form; and audio and pictures in working memory are the third form. The fourth form is portrayed in the working memory by verbal and graphical models. In the fifth form, schemas (previous knowledge), are retained in long-term memory (Mayer, 2005).

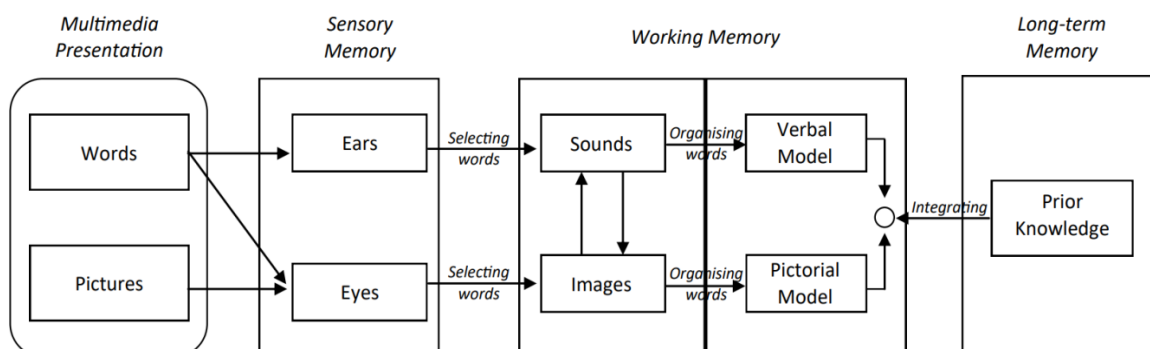


Figure 1. Mayer's Cognitive Theory of Multimedia Learning
Source: Mayer (2010)

Implementation of this process with Code-Switching to better relate the presentation with the learner to enhance the learning experience to attain improved results is the gap of the study. By doing so, the learners would be able to use their mother-tongue in CTML to obligate a better learning experience. The multimedia principle and the contiguity principle are the two cornerstone notions of CTML.

The multimedia principle posits that the acquisition of knowledge among children can be enhanced through the provision of both visual and textual aids, in addition to verbal communication, which is akin to the Dual Coding Theory (Mayer, 2014). In addition, the multimedia idea is superior to DCT. It refers to a broad concept that, when delivered collectively, incorporates a variety of visual and linguistic representations, and is not just limited to text and images. Multimedia instructional visual components include graphics, images, charts and graphs, portraits, and particularly movies and simulations (Butcher, 2006). Texts, words, and voices constitute the verbal components. The brain can assimilate and store additional data in working memory when words and visuals are combined (Sweller, 2005) and can be retrieved when necessary from long-term memory.

Potential multimedia information overload is explained by the temporal contiguity concept. It contends that concurrent text, audio, video, image, and animation delivery is preferable to sequential or non-sequential delivery since students can cram more from learning aids this way (Mayer & Fiorella, 2014). As per the Cognitive Theory of Multimedia Learning (CTML), it is imperative for students to have access to relevant textual and visual information concurrently in their working memory to facilitate the process of linking diverse concepts (Mayer, 2008).

III. STATEMENT OF THE PROBLEM

The objective of the study is to teach English vocabulary with regard to its storage in long-term memory and effective retrieval. CTML and Code-Switching are employed for effective results in this research. In the course of this research, the language alternation tool of code-switching functioned as a link between the mother tongue and the target language. CTML (Cognitive Theory of Multimedia Learning) contributed to this paper by easing out the science of information needed to make code-switching in multimedia. The paper aims to enhance the vocabulary competency of the undergraduate students. The objective of the study is not only to enhance their vocabulary competency but also to enrich and heighten long-term memory to utilize its potential to store the acquired vocabulary and retrieve it when necessary without a glitch. With a handful of research work scattered around us to help augmentation of vocabulary competence, this research paper would ease the method by including the usage of the mother-tongue in the process. By employing code-switching as a teaching strategy and implementing it in CTML, the researcher has developed a new way of vocabulary enrichment.

IV. METHODOLOGY

This empirical study paves its way towards enhancing the vocabulary skillset of the learners in a much more efficient and interesting manner, by means of which the primary focus of improving the learners' vocabulary level shifts from B1 level to B2 level (CEFR). The process is approached using CTML being an interface and Code-switching as an approach.

A. Participants

The present empirical investigation employed a random sampling method to select a sample of 40 individuals aged between 17 and 20 years ($M=18.5$, $SD=1.11$). Therefore, their involvement was of their own accord. The aforementioned samples pertained to English as a Second Language (ESL) classrooms, indicating that all subjects were uniformly exposed to equivalent levels of knowledge. Following the diagnostic test on B1 level vocabularies, the samples were categorised into two distinct groups: the control group and the experimental group. The primary objective of the research is to augment the lexicon of samples at the B2 level by utilising code-switching and the Cognitive Theory of Multimedia Learning.

B. Instruments

Quite a few instruments were employed in this research work. Some of the instruments are Prime Video (OTT), google forms, Microsoft Teams, and SPSS. As the research was conducted during the pandemic, the assessments were conducted and worked upon via Microsoft Teams. With reference to that, both the pilot test and the final assessment were conducted in google forms. Post assessments, the scores earned by the learners were evaluated in SPSS to find the efficacy of the idea employed in the study.

C. Intervention and Procedures

Divergent pedagogical approaches were employed for the control and the experimental cohorts. The control group was controlled by the conventional method of teaching. The classes were no different from the regular classroom sessions. The experimental group were exempted from this method of teaching. They were provided with instructions on how to learn from the techniques and instruments employed in the study. The experimental group were directed to watch a movie scene while paying attention to the subtitles. The movie was in their native language and the subtitles were in English. They were allowed to pause, rewind and watch the same scene over and over until they understood the English term for important words uttered in the movie clip.

This difference in the teaching procedure was employed to find the effectiveness of the proposed study. While the sessions were conducted online, the experimental students had the liberty to watch the movie clip with subtitles on their

own devices with an amazon prime subscription for a certain amount of time allotted for the practice session. This accessibility towards the study material brings ease and makes the learners independent.

The doubts were clarified immediately for both the sample groups as Microsoft Teams was used. The comment section was truly useful to give corrective feedback and help the learners with efficient learning. At the end of the practice sessions, questions were given to both groups via Google form for the final assessment of the study. Throughout the study, emphasis was placed on providing both the control and experimental groups with the necessary tools to effectively implement the guidelines outlined at the onset of the research, thereby enabling them to successfully navigate the intervention.

In summation, 2 sets of tests were conducted after the diagnostic tests. The weightage of each test was 20 marks. Prior to the teaching sessions, a pre-test was administered to both the control and experimental groups, utilising B1 level (CEFR) vocabularies. Following the teaching sessions, the control and experimental groups underwent multimedia sessions, respectively. Subsequently, a post-test assessment was conducted, utilising B2 level (CEFR) vocabularies. The post-tests of both groups underwent a scale reliability test with a Cronbach's value of $p > 0.764$ to determine their reliability. The data were examined, using SPSS for further analysis and results.

D. Subtitles as a Vocabulary Learning Tool

The acquisition and consistent retrieval of an extensive lexicon are fundamental components in the process of acquiring proficiency in a non-native language, as the utilisation of unfamiliar lexical items is not viable in oral communication (Hulstijn, 2007). Following the seminal research conducted by Karen Price in 1983, several studies have confirmed that watching movies with subtitles does make it easier to learn new words. These investigations have uncovered a number of other benefits of utilising subtitles (Sadiku, 2018). Films are among the most notable examples of multimedia resources that can be used in a classroom setting to teach a foreign language, particularly when subtitles or captions are added to the film. The encoding process of written and spoken language occurs only once, whereas the encoding process of word images takes place twice, first visually and then vocally. As a result, images leave our brains with twice as many and, thus, stronger imprints. This is due to the fact that words' images are twice encoded: visually and verbally (Kirschner & Neelen, 2017). When a learner makes use of captions or subtitles, they can utilise more of their working memory capacity (Baddeley, 2002). Furthermore, the captions, subtitles, and audio text show virtually simultaneously, and there is a decreased possibility of the learners' cognitive capacity becoming swamped (Mayer, 2014). As a result, the use of captions or subtitles is anticipated to contribute significantly more to improved word memory as well as incidental vocabulary development (Mayer, 1994).

Furthermore, multimedia in the curriculum can be helpful even to students who are not academically strong. The reason for this is that while videos may present a difficulty for the average student, their speech can be understood with the aid of subtitles. These subtitles may be generated automatically by the viewer or composed manually, and are displayed on the screen (Talavan, 2010). Scholars have noted that films, being audiovisual materials, offer unique contexts that involve action, as opposed to static images. This distinct quality of video has been identified as a potent medium for learning (Bates, 1985). Multimedia, being authentic audiovisual resources, prioritise natural language usage at a conversational pace and encompass diverse accents from individuals of different ages, genders, and sociocultural backgrounds, without emphasising the form (Lertola, 2012). Price conducted one of the initial investigations into the efficacy of subtitling and discovered that its implementation resulted in heightened comprehension of various cultural nuances, linguistic characteristics, and societal conduct (Price, 1983).

Research in the realm of second language acquisition suggests that utilising subtitled films as a form of comprehensible input can enhance the efficacy of vocabulary acquisition (Gorjian, 2014). Whether it was unintentional or deliberate; in addition to taking into account other aspects such as the number of times the multimedia content can be viewed (Etemadi, 2012). In this research, it is prominent that with the help of subtitles, even students in the ESL classroom who have little knowledge about the language were able to implement this method efficiently as the process involved their mother-tongue. In a conventional learning environment, the implementation of the mother-tongue is not encouraged but in this method, the researcher made sure that the audio in the mother-tongue made it easier for the learner to match the visual content in English to the auditory content in mother-tongue. This influenced the learning curve predominantly for the welfare of the learner. The understanding they gained over the learning content was exceptional.

E. Hypotheses

To determine whether the assumed statement of this study is true or not, the null hypothesis (H_0) was developed to examine the experimental data gathered for this investigation.

H_{01} : Non-native English speakers cannot acquire new vocabulary by using CTML that enabled Code-switched learning phenomenon.

H_{02} : There is no significant difference between the conventional teaching method and the CTML-induced teaching method.

H_{03} : Parents' education does not impact vocabulary acquisition in English using CTML induced Code-switching phenomenon for the students.

V. RESULTS

A. Paired Sample Statistics

TABLE 1
PAIRED SAMPLE T-TEST

Pair 1	N	Mean	SD	MD	t	df	Sig. (2-tailed)
Pre-Test	40	9.75	2.227	-3.675	-7.981	39	0.00
Post-test	40	13.43	3.029				

Table 1 displays the outcomes of the paired sample t-test. The larger and smaller size trial differences of the variable are stated in this test based on participant data. The pre-test mean ($M = 9.75$, $SD = 2.227$) is lower than the post-test mean ($M = 13.43$, $SD = 3.029$). The influence of the intervention and the mean differences between the dependent samples were both statistically significant, in accordance with the outcome, $t(39) = -7.981$, $p = 0.00$. The statistical significance level, as determined by the p-value, is below the predetermined threshold of 0.05. As a result, the alternative hypothesis has been embraced while the null hypothesis has been discarded. The phenomenon of Code-switched learning augmented with CTML has the potential to aid individuals who are not native speakers of English in acquiring new vocabulary.

B. Independent Sample Statistics

TABLE 2
INDEPENDENT SAMPLE T-TEST BETWEEN THE POST-TESTS OF THE CONTROL AND THE EXPERIMENTAL GROUPS

Groups		N	Mean	SD	MD	t	df	Sig. (2-tailed)
Post-test	Control Group	20	11	2.103	-4.85	-8.54	38	0.00
	Experimental Group	20	15.85	1.424				

The statistical analysis of the independent sample t-test indicates that there is a significant difference between the post-test outcomes of the control group and the experimental group. The descriptive statistics evaluated the average effect size of both categories. The experimental group's post-test results ($M = 15.85$, $SD = 1.42$) were comparatively higher than those of the control group ($M = 11$, $SD = 2.1$). A statistical analysis was conducted to determine the mean difference between the control and experimental groups. A two-tailed t-test for independent samples was utilised, with the assumption of equal variance. The resulting post-test outcome was found to be statistically significant, with a t-value of -8.54 and a p-value of 0.00, based on a sample size of 38. The adoption of the alternative hypothesis is thus favoured, whereas the null hypothesis is dismissed. The present study concludes that there exists a significant difference in the instructional strategies employed by the control and experimental groups.

C. ANOVA (Analysis of Variance)

TABLE 3
ANOVA FOR PARENTS' EDUCATION

	N	Mean	Std. Deviation	F	Sig.
School Edu	20	11.15	2.277	27.365	0.000
College Edu	14	16.07	1.817		
Higher Edu	6	14.83	0.753		
Total	40	13.43	3.029		

Table 3 illustrates how one of the demographic factors influences vocabulary growth through code-switching. The table divides the education of the parents into three categories: high school, college, and additional education. The results of the examination suggest that there exists a significant disparity among the three tiers of education in the outcomes of the post-test. Based on the ANOVA findings, it can be inferred that parents possessing a college education ($M = 16.07$, $SD = 1.8$) exhibit a comparatively greater score among the three groups. Following them, are the parents with higher education ($M = 14.8$, $SD = 0.7$). Then comes the parents with school education with a lower value ($M = 11.15$, $SD = 2.27$). Consequently, parents' educational levels have a significant influence on their children's capacity to learn vocabulary through the CTML-induced Code-Switching phenomena. The alternative hypothesis has been accepted, and the null hypothesis has been rejected based on this conclusion.

TABLE 4
TUKEY HSD MULTIPLE COMPARISON OF PARENTS' EDUCATION

(I) Parental Education		Mean Difference (I-J)	Std. Error	Sig.
School Edu	College Edu	-4.921*	0.688	0
School Edu	Higher Edu	-3.683*	0.919	0.001
College Edu	Higher Edu	1.238	0.964	0.413

Notes: *. The mean difference is significant at the 0.05 level.

The post hoc analysis in Table 4 compares all three levels of parents' education. Firstly, the results of parents with school education are compared with the results of parents with college education. There is a significant difference found in the output ($MD = -4.9, p = 0.00$), which is lesser than the standard value of 0.05. Secondly, the results of parents with school education are compared with the results of parents with higher education ($MD = -3.6, p = 0.001$). The obtained p-value is below the conventional threshold of 0.05, indicating statistical significance and implying the presence of a notable difference in the results. Finally, the results of parents with a college education are compared with the results of parents with higher education. There is no significant difference found in the results ($MD = 1.2, p = 0.41$), which is higher than the standard value of 0.05.

TABLE 5
TUKEY HSD OF GROUP COMPARISON ON PARENTS' EDUCATION

Tukey HSDa,b

Parental Education	N	Subset for alpha = 0.05	
		1	2
School Edu	20	11.15	
Higher Edu	6		14.83
College Edu	14		16.07
Sig.		1	0.336

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 10.413.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 5 shows which level of parents' education has a different mean in the post-test results. The parents with school-level education are in subset 1 and the parents with higher education and college education are in subset 2. The Tukey HSD shows that there is no significance within the subsets for the p-value of subset 1 = 1 and subset 2 = 0.33. The subsets when stood individually are significant.

VI. DISCUSSION

With reference to the above confirmed statistical outcomes, the researcher shows that using subtitles-induced multimedia content can be used to enhance code-switching and enhance learning and acquiring new vocabulary. Before the intervention, the samples secured low scores in B1 vocabulary tests. However, after implementing the intervention, the students were more indulged in the process of learning, as the process included a part of relaxation and recreation. The post-test on B2 vocabulary showed a massive difference in terms of understanding and rationalizing the options before answering. Table 2 indicates a significant disparity in the post-test outcomes of the experimental and the control groups, indicating that the integration of the CTML-based learning approach leads to more substantial advancements in student learning. As the code-switching element was used as an influencing factor, the students with less interest in the learning process were able to deliver better results. On conducting a comparative analysis between the control group and the experimental group, it was observed that the progress of the experimental group samples was significantly higher. Based on the data presented in Table 2, it can be observed that the outcomes of the post-test conducted for the experimental group exhibit a noteworthy contrast in comparison to those of the control group. Although the results of the control groups' post-test show a substantial difference from their pre-test, the advancement shown by the experimental group samples had a better leap in vocabulary acquisition.

The students whose parents had higher education performed better than the students with school-educated parents. Even as a small difference, this makes a huge impact on the progress of the students. The rationale behind learning subconsciously is found common among graduates and postgraduates. In Table 3, the impact of parents on the student's ability to acquire vocabulary using this technique is explored through their educational qualifications. The parents with

higher education and college education came under the same subset serving the best when compared to the parents with school education. The students who belonged to the former were able to progress well when compared to the students who belonged to the latter. To dive deeper into the influence of parentage, multiple comparisons on the parents' education were conducted through Tukey HSD: multiple comparisons. In Table 4, when parents with a school education were contrasted with others with a college education and higher education respectively, both analyses had a significant difference. Whereas when parents with higher education were contrasted with the ones with college education, there was no significant difference found. Therefore, it is evident that the impact of parents' education is obvious over vocabulary acquisition of the students using the CTML induced code-switching phenomenon. Even with some limitations and barriers the intervention proved to be better than the traditional teaching methods for vocabulary acquisition.

According to scholars, multimedia is typically defined as a fusion of textual and visual elements. According to their argument, the process of multimedia learning occurs when individuals generate cognitive representations based on the words and images presented to them (Mayer, 2005a). Teachers use PowerPoint presentations to share their ideas and provide textual input to the students. But nowadays, PowerPoint is a challenging tool itself with overcrowding information that is available to the students through other channels (Chintalapalli, 2021).

The visual content has various accompaniments like the social setting where the word is used, the scenario when the word is used and the scripted mental stability of how the word is used. The very setting brings life to the application of a word used in the context. When projected in perfection, it is more than what could be comprehended in a classroom environment. A word with life in a scripted setting is way better than a word printed in a notebook. The visual elements may comprise a variety of graphical depictions, including but not limited to photographs or videos, while the accompanying textual content may be presented through oral or written means (Sorden, 2012). The purpose of this research is accomplished using a video clip. Clippings from movies in mother-tongue are used to learn new vocabulary. CEFR verified B1 and B2 level vocabularies were used in this research. Clipping which has such vocabulary was played for the experimental group. As per the CTML model, the auditory (verbal) and visual (English subtitles) stimuli underwent processing in the working memory prior to being encoded in the long-term memory, thereby rendering them accessible for retrieval as and when required. Due to the effects of cognition underlying this process, the learners were able to relate better when the audio was played in their mother-tongue (code-switching). This helped the researcher to get better results.

Student 1 "When I watched the movie in Tamil (Mother-tongue) and saw the subtitles in English I was able to understand the word without any dictionary or Google's help. And the word was played in the movie, so it is easy for me to register it in my mind. It is almost a month since the assessment and still, I can recall the words. This is new and I will follow this and put it into practice".

Through the feedback obtained from the experimental group after a significant amount of time to observe the validity of the research, the researcher finds the method used for assessment to be valued and unconventional, yet successful.

Student 2 "I was afraid of English. I am inferior to attending classes to improve my English. This learning through subtitles technique has helped me to improve myself without anyone's help. Reading English subtitles in Tamil movies is helping me not only learn the word but also learn its meaning. Slowly I am learning to use the words in sentences".

The technique used in the assessment has strengthened the students' confidence level according to Student 2's feedback. The code-switching involved in the study has encouraged Student 2 that language acquisition can be done without the need for a classroom.

Student 3 "The session was useful. I was able to learn new words from the subtitles. It was very interesting, and still, I remember the new words from the class. It was easy to learn also I got to learn many new words from the subtitle It was very easy and understandable. This class was very useful to me and I got to learn new words from this class".

From the experience of Student 3, it is apparent that even after a month, the words used in the assessments can be remembered. Through the process, it is evident that the long-term memory worked flawlessly in the storage and retrieval of the words acquired through CTML and Code-switching assessments. With the technique acquired through this assessment, students can further use this method to learn new words with their meanings and their application in sentences. By just the knowledge of how to develop oneself in the elements of language learning, one can easily develop himself/herself. But consistent practice is the key. The Gen Alphas are seldom interested in the good old teaching methods. They need something effortless and fast. They have understood the difference between English as a subject and English as a language. Hence, they are ready to acquire the language efficiently enough to express themselves to the world proficiently. Books for language learning are outdated as they will only guide and serve them to clear the examination conducted to check their knowledge that they claim to have possessed. Lessons taught in the classroom are expected to be applied in a learning environment, thus enabling students to make the most of their experience that pertains to the application.

VII. CONCLUSION

A positive approach to teaching English as a language involves adopting a “humanistic approach, negotiating learning goals and assessments, being sensitive to learner needs, allowing learners’ mistakes, providing real-world tasks, reducing corrective (negative) feedback, creating a relaxing learning environment, and allowing the use of L1 in the classroom” (Wilang, 2021). Everything around us has been updated and automated. Enhancing the learning process is the need of the hour. With classrooms on your palm, conventional learning methods must not be left to be obliterated but heightened using technology. As Gen Alphas are independent, the teachers and facilitators of the previous generation must understand the importance of bringing the learning curve to sophistication. This is possible if the learning is connected to the reasoning involved in a learner’s activity. In recent days, the classroom has shifted to livelihood, people learn from things around them. And this is just the beginning.

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