The Effect of Lean Methodology on EFL Learners' Reading Comprehension Performance

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***Abstract*—As the demands of English language learners should be satisfied, the question of various teaching techniques has become contentious in classrooms. Lean, a cutting-edge approach, provides a successful way to learn a language. Teachers must employ efficient teaching strategies to accomplish their goals and excite learners. The current study looked into how teaching English as a second language affected students' ability to read comprehension. A control group and an experimental group were utilized in a pre-post-test quasi-experimental design. Following the pre-test, the experimental group received the treatment whereas the control group did not receive the treatment. For the analysis, 40 language learners from a language school in Erbil, Iraq, were taken into consideration. Lean was also disseminated to the participants to help them determine their aims before being applied as a teaching approach to the students. Descriptive and inferential statistics were used in the statistical analysis (i.e., independent samples t-test). In terms of how the two groups performed on the pre- and post-tests. It was discovered that the scores were different in a significant manner. This brand-new lean education strategy has been demonstrated in this research conducted in the context of Iraq to improve learning outcomes (in this case, reading comprehension skills), complete the curriculum on schedule, and eliminate any specific waste.**

***Keywords*—EFL learners, English language teaching, Lean, Reading comprehension skills, Waste.**

I. Introduction

To the best of the researchers' knowledge, only a few studies have considered the implementation of lean, and at the same time, no studies have examined the impact of lean methodology on language learners' reading comprehension ability or any other language skills within the context of Iraq. The present study was an attempt to close both of these research gaps.

A. Lean

According to Ziskovsky and Ziskovsky (2011), lean is a method for advancing a task in a process by eliminating stages that are unnecessary. The core of the lean technique is "elimination," and it continually becomes better. It is a phrase used to describe a method that is added to the process of managing chores for both personal and professional purposes. It deals with the removal of practices that consumers or end users deem wasteful as well as the spending of time, money, effort, or resources other than those necessary to create value.

One of the common definitions of lean was stated by Wilson (2010). He emphasized that lean is a whole collection of methods for getting rid of and cutting back on the seven main types of waste. By implementing this approach, a business may become "leaner," which improves and increases responsiveness by cutting down on waste. According to another definition of lean in Wikipedia, it is a set of tools that aid in the detection and elimination of wastes to enhance product quality, manufacturing efficiency, and cost.

The phrase "waste" or "unnecessary effort" is used to refer to all actions that do not provide value for the client (Sonnenberg and Sehested, 2011). Various classifications of waste exist, and their reduction is an ongoing process. Although not achieving a total waste-free outcome, optimizing the process will lead to enhanced efficiency. According to Aij and Teunissen (2017), the process comprises multiple steps, but a significant proportion of them is deemed redundant. As suggested by Francis (2014), the implementation of lean methodology necessitates a significant degree of organizational learning and cultural investment for its triumph.

B. Lean thinking

Lean manufacturing, sometimes known as lean enterprise and lean thinking are both abbreviations for the same

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concept. It could be denoted as a lean methodology for the public sector or a lean approach for the health-care industry. As suggested by the research conducted by Aij and Teunissen (2017), it can be inferred that sales are dependent on the seller. According to Stenzel (2007), lean thinking can be regarded as a management approach that aims to foster a culture of continuous improvement.

There are worries that lean application may standardize education, make employment more "efficient," or turn schools into "factories." These concepts do not fit the lean application; however, they nonetheless allude to a non-thinking lean application (Dobbelaer, 2010). Doing more with less is a key component of Deming's (1993; mentioned in Patri and Suresh, 2018) "Lean Thinking" methodology. It gets rid of the process stages that are unnecessary. This program is dynamic. It assesses and inquires as to how a procedure may be carried out better with a better result. On the other hand, does the worth of the client change if a step is skipped (Ziskovsky and Ziskovsky, 2007)?

Production methods alter as a result of lean thinking. It encourages businesses that employ lean thinking to streamline information flow by setting up pull loops and a single point of production while the production is scheduled (Marchwinski et al., 2008). It made people everywhere aware of the distinctions between waste and value creation (Ries, 2011). This process requires a lot of work since a true lean process must evaluate the processes and rework them to provide value to the client (Comm and Mathaisel, 2005).

C. Lean methodology

There are several methods to describe lean technique. The "house of Lean," which was taken from Dennis (2007, cited in Francis, 2014), is one of them see Fig. 1.

The foundation of the house through the center is its methodology. "Just in time" and "Jidoka" were written on both sides of the house. Just in time means keeping inventory waste under control. Jidoka is a symbol of the efforts made by both humans and robots to reduce mistakes. The core is the flexible moment of all employees, while the roof is understanding value from the perspective of the client and minimizing waste.

The Socratic Method of questioning, establishing hypotheses, data-driven analysis in the scientific method of Henry Ford to empower people, and the process of continuous variety of objectives by Deming are the underpinnings of lean (cited in Patri and Suresh, 2018; Ziskovsky and Ziskovsky, 2007).

D. Lean in education

Although lean is not the only solution to address issues in education, its methods and philosophy are helpful in this field (Flumerfelt, 2008). Teachers agree that examinations with high stakes restrict the curriculum's substance so that teachers may concentrate on the areas covered in the examinations, which causes knowledge to be fragmented (Dobbelaer, 2010). Systems are analyzed using a variety of methods, such as CX lean, which is used to evaluate each new system. C stands

Fig. 1: House of lean model (adapted from Dennis, 2007).

for congruence, sometimes known as a "equal condition," and X denotes that the various ways congruence might emerge in a system. The Plan-Do-Check-Adjust method is used. CX emphasizes two areas: Organizational intelligence and performance management, which together make up the core notion of lean (ibid). According to Francis (2014), lean implementation cannot succeed without accommodating and comprehending the culture and subculture that they serve. A culture of innovation is a major factor in enabling lean methodologies. By promoting planning, organizational learning, and thinking, lean is infused into the current culture.

According to Houston (2008), lean methodology is a key tool for improvement in higher education, which currently places a greater emphasis on improvement than accountability. In his article "Lean higher education; enhancing the value and performance of university process," Balzer (2020) demonstrated where the process fails when there is a wastage of resources or time; to say it in other words, lean is appropriate for improvement.

According to Emiliani (1998), if lean is done properly, it causes an organization to learn. According to Bowen and Spear (1990), the Toyota Production System (TPS) is a type of system that benefits both managers and employees. They are exposed to experimentation, the foundation of a learning organization. They discovered explanations for how this company differs from the other businesses, they have researched.

According to Flumerfelt (2008), it is erroneous for educators to discard lean without comprehending it. Lean may serve as the foundation for school-business cooperation rather than being the exclusive mode of operation. The challenges faced by schools such as inadequate funding, absence of organizational learning, and ineffective remediation provide a great chance to apply lean thinking and implementation. Lean methodology suggests addressing the problems' roots rather than their symptoms. Lean is incredibly beneficial for pupils who are experiencing educational limitations.

Four universities in England were taken into consideration in Finn and Geraci's (2012) paper. Lean initiatives aimed to lessen the amount of money those senior executives were worried about. The outcome was excellent. They were able to conserve time and resources, improve dependent employee morale and satisfaction, and boost process accuracy.

Ziskovsky and Ziskovsky (2007) demonstrated in their study that 80% of the procedures used in a particular task in their environment to get the intended product were superfluous. It implies that the squandered time and resources may be saved and used for other tasks.

Tilfarlioglu and Faraj (2017) conducted a study to examine the impact of implementing a lean-centered approach on enhancing student achievement in English language teaching. Fifty-six high school students in the 11th grade who were enrolled in a coeducational preparatory school in Sulaimaniyah, Iraq, took part in this research. To determine the model's usefulness in the implementation of lean, experimental research was carried out. Both the control and the experimental groups' participants in the research received varying accomplishment scores. In both the pre-test and post-test, the learners' final scores in the experimental group were statistically significant. The outcome of the pre-post-tests between the two groups showed significantly different results.

II. Methodology

The primary research inquiry of this study aimed to determine if the implementation of lean as a novel approach has a noteworthy impact on the reading comprehension proficiency of students. Therefore, the following procedures have been implemented.

A. Participants

The participants in this research were Iraqi citizens who were intermediate language learners in Erbil. Participants from four intact courses were allocated into experimental and control groups at random. The experimental group and control group consisted of 20 students each, divided into two separate classes. The pupils, who ranged in age from 14 to 19, were all from Erbil and spoke either Kurdish or Arabic as their mother tongue.

B. Instrumentation

Preliminary English language test (PET)

Cambridge English language assessment has provided an intermediate-level PET to check out the current ability of language learners through all basic language skills.

Pre-test, treatments, and post-test

The instrument used in the study was a reading comprehension test, provided as both pre-test and post-test. The treatment continued for 2 months and the students were supposed to read about the topics which the researcher provided for them.

To investigate whether lean methodology was effective on students' overall reading comprehension performance or not, students' pre-tests and post-tests were assessed.

C. Procedure

The researchers built and organized the lean application process adequately because the research was a quasi-experimental one. The participants in the current study were subjected to the same lean procedures and methods employed in this investigation. The actions were carried out by Ziskovsky and Ziskovsky's book (2011). Only the experimental group's language learners were exposed to lean as an innovative approach and its methodologies. The control group was instructed without using any lean guidelines or making any alterations.

TABLE I
Descriptive Statistics for the Post-Test Scores

Groups	Statistic	SE
Post-test		
Control		
Mean	13.35	0.94
SD	4.54	
Experimental		
Mean	15.85	0.88
SD	3.89	

The subsequent stage of the study comprised administering reading comprehension assessments to both the experimental and control groups to gather data for the pre-test. The examination records were reviewed by the researchers.

The groups studied the lectures by the same researchers on the same day. To eliminate the nine wastes in education that Ziskovsky and Ziskovsky (2011) advocated, the researchers in the experimental group recorded the teachings. These wastes were introduced to the experimental group members to provide everyone the equal opportunity to comprehend lean. The experimental group participants and the researchers used the lean technique to prepare all of the lesson plans and materials needed before the procedure began.

There are several kinds of waste in lean education, and the model for lean education that was put out in this study was meant to apply lean principles of waste to the teaching profession. Focusing on this objective, the concept of waste and its ensuing elimination steps adapted to the aforementioned educational reality have been mentioned as "Over Processing," "Overproduction," "Inventory," "Transport," "Motion," "Waiting," "Defects," "Specifying value," "Value stream mapping," "Flowing the processes," "Pulling the processes," and "Promoting perfection."

As the aforementioned waste categories indicate, the current study made an effort to take each into account and create the ideal environment for the teaching process within the framework of the present study about reading comprehension performance. To clarify, the students initiated the process of disposing of instructional materials and classroom supplies that were deemed unnecessary. The students felt more at ease and relaxed as a result of this approach. To take into account the requirements and values of the participants, the first five minutes of each session are set aside for a meeting between the teacher and the language learners.

Lean suggests that the lesson can be hosted wherever the language learners would want (such as a café). The researchers attempted to implement the language learners' proposals like these wherever it was feasible for the current study. In lean, a student-advising scheduling procedure allows the students to select the course contents, which results in the

transition from "my plan" to "our plan." The goal was to create the ideal teaching standards; this involved co-creation with the students.

The study's final phase involved administering a post-test to both the experimental and control groups to evaluate the degree of variation between them.

III. Results and Discussion

As the current study was quantitative, the data obtained by means of the reading comprehension tasks were analyzed quantitatively to find any possible effect of lean on language learners' reading comprehension enhancement. The Statistical Package for the Social Science version 25 (SPSS25) was used to analyze the data. An independent sample t-test was employed to examine the pre-test and the post-test results. Descriptive statistics such as mean, minimum, maximum, and standard deviation were also provided before the inferential statistics.

Table 1 shows that as in the post-test, the experimental group members had a better performance in the post-test. The mean and standard deviation of the experimental and the control group members were 15.85 and 3.89, and 13.35 and 4.54, respectively. As stated above, the descriptive statistics are not good indicators of the significance level of the differences between the groups, and thus, inferential statistics were needed. For the purpose of the present study, independent samples t-test was run. See Table II.

According to the t-test results, the significance level was found to be below 0.05, indicating that there was a statistically significant difference between the two mean scores. It can be inferred with a 95% confidence level that the intervention was effective. This suggests that lean, as a novel approach, has a notable impact on the reading comprehension abilities of language learners.

IV. Discussion

Similar to the findings of the current study, Finn and Geraci (2012) and Tilfarlioglu and Faraj (2017) concluded that the lean approach was an ideal technique for decreasing waste and improving the environment. Through the former, participants were able to save time and money, improve dependent employee relations and satisfaction levels, and ultimately raise process accuracy. On the other hand, in the latter, the students played their respective duties since the lean culture encourages them to contribute effectively to the process. The lean-centric paradigm led to the elimination of every phase that was included in the program but offered nothing to the students' final product, which subsequently improved the learning process. It can thus be advantageous to examine lean and its waste-free nature to create a lot more desired classroom where group work is the dominant policy, since the findings of the research all acknowledged the usefulness of using lean methodology and eliminating wastes.

V. Conclusion

The results of the current study shed light on the usefulness of implementing lean as a cutting-edge technique in the field of teaching English. The results highlight the significance of applying this strategy and its benefits for raising reading comprehension performance levels. It was statistically significant that the experimental group differed from the control group. The results are intended to inspire educators to be adaptable in using various tactics and procedures in their classrooms to fulfill the requirements of their students. Since it is impossible to completely teach a language, course designers and instructors should make choices. By selection, the teachers know what the language is and what is important in language learning (Basturkmen, 2014).

Lean was used in this experimental study to improve learners' reading comprehension performance. The requirement for instructors to create their own curriculum has increased in recent years. They are supposed to develop, implement, and assess the curriculum they utilize. The instructors believe that they are in charge of the majority of the process's duties. As their duties are increased, some teachers feel extremely at ease, which is consistent with what lean values highly among the participants and staff. Some instructors feel that they are being asked to accomplish things for which they are not qualified since they are required to build the curriculum based on their area of expertise.

When EFL students' lessons were taught using lean, which promoted a variety of interests and learning opportunities, their reading comprehension skills improved. Following lean, which came from the TPS, will provide instructors the opportunity to understand many teaching and learning ideas and methodologies. This has been utilized in English language instruction to improve pupils' language proficiency. The lean-centered concept was created to improve the

TABLE 2
Independent Samples T-Test for the Post-Test Scores

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	SE Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Post-test									
Equal variances assumed	0.015	0.815	−2.32	38	0.045	−3.00	2.33	−4.54	−0.36
Equal variances not assumed			−2.32	37.83	0.045	−3.00	2.33	−4.54	−0.36

performance of all program institutions. The curriculum built according to the lean-centered model focuses on training students from any institution or stakeholder group to improve their accomplishments and satisfy their demands, as well as to grasp the course contents. In this research, a heavy emphasis was placed on the development of reading comprehension skills for students to be successful participants in the whole process. In addition, the model is intended to reduce any non-value-adding wastes inside the program. Pienemann and Johnston (1987) say that in language acquisition, the application should precede learning. Lean never ceases to improve the productivity and accomplishment of learners. If the final result is successful, it attempts to enhance the application of the program for the next run. If it fails, it searches for solutions to the issues (Borbye, 2010).

References

Aij, K.H., & Teunissen, M. (2017), Lean leadership attributes: A systematic review of the literature. *Journal of Health Organization and Management*, 31(7/8), 713-729.

Balzer, W.K. (2020), *Lean Higher Education*: *Increasing the Value and Performance of University Processes.* United States: CRC Press.

Basturkmen, H. (2014). *Ideas and Options in English for Specific Purposes*. 1st ed. Mahwah: Taylor and Francis.

Borbye, L. (2010). Out of the comfort zone: New ways to teach, learn, and assess essential professional skills--an advancement in educational innovation. *Synthesis Lectures on Technology, Management, and Entrepreneurship*, 2(1), 1-79.

Bowen, H.K., & Spear, S.J. (1990), Decoding the DNA of the Toyota production system. *Harvard Business Review*, 77(5), 97-106.

Comm, C., & Mathaisel, D. (2005). A case study in applying lean sustainability concepts to universities. *International Journal of Sustainability in Higher Education*, 6(2), 134-146.

Dobbelaer, S.G. (2010). Do High-stakes assessments improve learning?. In: S. Flumerfelt (ed.) *White Papers. The Pawley Lean Institute*. Available from: http://www.oakland.edu [Last accessed on 2023 Jan 10].

Emiliani, M.L. (1998). Lean behaviors. *Management Decision*, 36(9), 615-631.

Finn, L., & Geraci, L. (2012). *Implementing Lean for Process Improvement: Strategies and Recommendations for Process Improvement in Financial Affairs.* United States: Education Advisory Board, University Business Executive Roundtable.

Flumerfelt, S. (2008), *Lean Thinking for Schools: Learning to Identify Value and Eliminate Waste*, Education Reports. Available from: https://www.educationreport.org/pubs/mer/article.aspx? [Last accessed on 2021 Jan 20].

Francis, D. (2014). Lean and the learning organization ın higher education. *Canadian Journal of Educational Administration and Policy*, 5(10), 23-45.

Houston, D. (2008). Rethinking quality and improvement in higher education. *Quality Assurance in Education*, 16(1), 61-79.

Marchwinski, C., Shook, J., & Alexis, S. (2008). *Lean Lexicon*. 1st ed. Cambridge, MA: USA (One Cambridge Center, Lean Enterprise Institute.

Patri, R., & Suresh, M. (2018), Factors influencing lean implementation in healthcare organizations: An ISM approach. *International Journal of Healthcare Management*, 11(1), 25-37.

Pienemann, M., & Johnston, M. (1987). *Factors Influencing the Development of Language Proficiency*. 1st ed. Australia: National Curriculum Research Centre, Adult Migrant Education Program.

Ries, E. (2011). *The Lean Startup.* 1st ed. The United States: Crown Business.

Sonnenberg, H., & Sehested, C. (2011). *Lean Innovation-A Fast Path from Knowledge to Value*, Berlin: Springer.

Stenzel, J. (2007). *Lean Accounting*. 1st ed. Hoboken, NJ: John Wiley and Sons.

Tilfarlioglu, F., & Faraj, H. M. (2017). The impact of using lean-centered model to increase the achievement of the learners in English language teaching. *International Journal on Recent and Innovation Trends in Computing and Communication*, 5(11), 230-237.

Wilson, L. (2010). *How to Implement Lean Manufacturing*. 1st ed. New York: McGraw-Hill.

Ziskovsky, B., & Ziskovsky, J. (2007). *Doing more with Less-going Lean in Education.* Lean Education Enterprises Inc. White Paper. p1-18. Available from: https://www.leaneducation.com/whitepaper-doingmorewithless.pdf

Ziskovsky, B., & Ziskovsky, J. (2011). *Optimizing Student Learning*. 1st ed. Milwaukee, Wis: ASQ Quality Press.