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**RESEARCH ARTICLE**

## The Impact of Problem-based Learning and Reading Stories on the Development of Moroccan Middle School Students' Critical Thinking Skills

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**ABSTRACT**

This research aims to investigate the effectiveness of problem-based learning and reading stories on students' critical thinking skills in Moroccan middle high schools. This paper employed a quasi-experimental pre-test post-test study design. The sample of the study was two groups consisting of 50 students aged between 14 and 15 years old at the 9<sup>th</sup> grade Tazi middle high school in Casablanca, Morocco. The participants were divided into an experimental group (N=25) that received the treatment study using a problem-based strategy and Black Beauty story by Anna Sewell level 3 mm. publications and a control group (N=25) that took normal classes. The researcher used a critical thinking test as an instrument and a T-test for the analysis. The findings, which have been quantitatively analysed, revealed a significant difference between the experimental and the control group (sig <0.05); it showed that the experimental group participants got higher thinking skills grades. Overall, we conclude that problem-based learning and reading stories influenced critical thinking skills positively.

**KEYWORDS**

Critical thinking skills, PBL, reading stories.

**ARTICLE INFORMATION**

**ACCEPTED:** 20 April 2023

**PUBLISHED:** 23 April 2023

**DOI:** 10.32996/jeltal.2023.5.2.9

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### 1. Introduction

The strategic vision (2015-2030) of reform for education in Morocco is based on equality of education to develop an inclusive and cohesive society. This vision also emphasised the importance of students being critical thinkers, problem solvers and innovators. Those qualities are essential and in great demand in today's society because they relate students to their social realities and help them upgrade their higher order skills. Accordingly, this study examines the improvement of critical thinking skills through reading stories and problem-based learning, which was coined by Barrows and Tamblyn in the 1960s (Engle, 1981), and it is a learner centred approach that is less dominant and more indulged in personal and individual requirements (Shakouri Masouleh Nima, 2012). Moreover, critical thinking skills are "also cited as an important learning outcome in many different national contexts, and though there has been little discussion on how critical thinking is manifested in African contexts" (Giacomazzi et al., 2022)

Critical thinking skills, along with problem-based learning competences, can be used to understand and use the target language and relate personal experiences to social issues for building autonomous learning and self-reflection. Thus, students promote their consciousness to solve authentic problems surrounding them because "learning from problems is a condition of human existence. In our attempts to solve the many problems we face every day, learning occurs. In looking for offices in an unfamiliar building, or addresses in an unfamiliar town, we eventually find our way. In filling out income tax statements, learning occurs, just as in trying to find out why the car won't start." (Engle, 1981) and more importantly, students will advocate their sociological critical thinking (Simmel, 1950) and social imagination (MILLS, 1959). Accordingly, the aim of this study is to examine the impact of reading stories

and problem-based learning on the improvement of Moroccan middle school students' critical thinking skills. The article begins with a short literature review, including an introduction to critical thinking skills, problem-based learning and reading stories. However, the second part is dedicated to the description of the methodology used, and the last part will present the results and discussion of the findings.

## **2. Literature review**

Critical thinking is deeply rooted in the Greek time period. The philosophers Socrates and Plato emphasized critical thinking and its importance in that era. It was considered a prominent feature of scepticism when challenging social problems (Inch & Warnick, 2011). Then during the Renaissance period in the 17 century, most scholars focussed on the use of critical skills in scientific research. It was at this time that critical thinking became a separate discipline in the United States and England. Dewey (Dewey, 1933) emphasizes the advantages of critical thinking in educational institutions both for teachers and students and (Bloom, 1956) wrote the book *Taxonomy of Educational Objectives*, highlighting the benefits of using critical thinking. It is very important to note that the role of critical thinking in learning a foreign has become prominent in the twenty-first century. Critical thinking skills are the competence to challenge the difficulties of the twenty first century and for students to be responsible, committed, reliable and problem solvers of their daily life circumstances and therefore build up their autonomy.

### **2.1. Teaching critical thinking**

According to (Halpern, 2001), Critical thinking skills requires assessment, reflection, analysis, synthesis, and attention to context. In this regard, the problems of 21<sup>st</sup> century students in and out the classroom settings require logical decisions through the thinking process and decision- making as cited by (Peaks, 2018): "Critical thinking involves identifying a problem, determining the best solution, choosing the most effective method for reaching the solution, implementing the solution, and then reflecting on whether or not the chosen solution was effective». Thus, critical thinking skills is quoted as " as a set of skills that involves both evaluation and problem solving"(Rouijel et al., 2019)

There are various approaches to teaching critical thinking in educational organizations. According to (Paul, 1989), teaching critical thinking includes two approaches, i) the traditional practice, a "didactic theory of knowledge, learning, and literacy", and a modern method dependent on the "emerging critical theory of knowledge, and learning and literacy" (p. 200). In addition, (Bensley et al., 2010) conducted research, and the findings of this research indicated that there exists a dissimilarity between the students who focus on "explicit critical thinking skills" and those students who "received no explicit critical thinking instruction" (2010: 91).

### **2.2. Critical thinking and reading stories**

It is worth mentioning that reading stories enables students to think critically and read what is behind the lines through assessing, questioning, analysing and introducing reasoned arguments. In doing so, students could acquire these qualities and upgrade them to develop their higher order skills. It is crucial to say that through immersion in stories, students will enhance their imagination and live in the events of the story (become part of it as a character). It is a teacher's job to introduce specific themes to the students and help them generate them by encouraging students to read and analyse them. Thus, readers (students) will develop and maintain the quality of building up personal perspectives and attitudes by hypothesising, theorizing and analysing the plots of the story. Importantly, reading short stories helps learners develop analytical thinking, synthesis of knowledge and problem solving.

### **2.3. Critical thinking and problem-based learning**

In 1969 PBL was introduced in Canada by Howard S. Barrows at McMaster Medical University (Engle, 1981), and it was applied effectively to other domains. It enables students to think critically towards their learning and everyday situations, and this is a part of Dewey's work which considered learning as an experiential process, "learning by doing" (Dewey, 1933), in addition (Servant-Miklos et al., 2019) mentioned that: "the learner should use what he already knew about the world from his everyday experience to seek out a solution". Thus, students use the problem case as prompts to portray their educational aims and promote their knowledge, understanding and independent learning (Wood, 2003).

Problem based learning is a set of strategies used as a "trigger" to develop students higher order skills, educational aims and thinking outside the box. It helps them predict the challenges and find pre-emptive clues to resolve the anticipated problems. For example, when students construct a solid critical thinking process, they will be able to identify the problem, collect-review information, examine and make a decision by using straightforward thought processes.

### **2.4. Previous studies**

A lot of research has been conducted on problem based learning and critical thinking skills [(Fadilla et al., 2021) (Suparman & Tamur, 2021) (Suparman & Tamur, 2021) (Liu & Pásztor, 2022) (Rashidov, 2022) (Razak et al., 2022) (Asokawati et al., 2023) (Schaller et al., 2023) (Radiansyah et al., 2023)]. They pointed out the signifiacnce of PBL in developing students' critical thinking. Another study was conducted about "Improving EFL Learners' Critical Thinking Skills in Argumentative Writing" "(Nejmaoui, 2018) "It aims

to explore the effect, if any, of integrating critical thinking on learners' use of critical thinking skills in argumentative writing, it used ". The researcher used 36 Moroccan EFL learners from the department of English and divided them into an experimental group and a control group, the study concluded that "the experimental group significantly outperformed the control group. The students' ability to use more credible evidence, address alternative arguments, support conclusions, and maintain the logical flow of ideas in their essays did not reach a mastery level in the post test, yet the average level they reached is reassuring in view of the short time of the training they had"(Nejmaoui, 2018) . However, the main aim of this study is to examine the effectiveness of using problem-based learning as a strategy and reading English stories to boost students' critical thinking in Moroccan middle schools.

### **2.5. Research questions**

To meet such objectives, the present research addresses and tries to answer the following research questions:

**Q1.** To what extent does problem-based learning impact the critical thinking skills of EFL (English as Foreign Language) learners?

**Q2.** To what extent does reading stories enhance students' critical thinking skills in the EFL classroom?

### **2.6. Variables of the study**

**1- Independent Variables:** In this study, critical thinking skills were taken as an independent variable.

**2- Dependent Variables:** Problem based learning and reading stories.

### **2.7. Expected findings (Hypothesis)**

The main research hypothesis underlying the present research assumes that:

• ***Problem based learning affects the development of EFL middle school students' critical thinking skills.***

• ***Students' critical thinking skills have been improved through reading stories in the EFL classroom***

### **2.8. Significance of the study**

This study is notable because it provides both theoretical and practical significance in the education system.

#### **i) For students:**

This research will enable the students not to be a container where the teacher has to put the knowledge but be creative and engage themselves in different activities that will enhance their critical thinking skills. It will also capacitate the students to move out of the myth that 'the teacher knows everything' and motivate them to freely give their opinions in the classroom and have discussions with their peers and the teacher. Thus, it will help them to use their creativity and imagination as well as be critical thinkers.

#### **ii) For readers:**

This study will provide readers with information about problem-based learning and how this approach can be implemented in the EFL classroom, and how students' critical thinking skills can be enhanced by using this approach along with reading EFL short stories.

#### **iii) For researchers:**

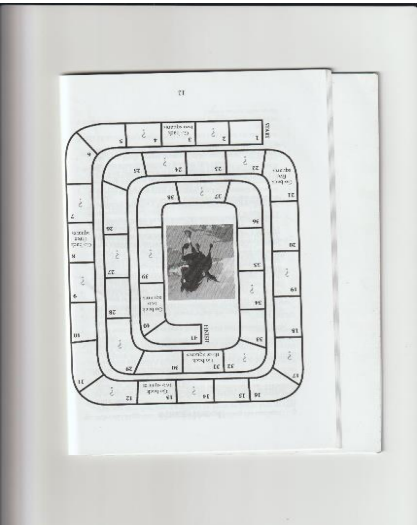
This research will be helpful for future researchers and enable them to do further research, like implementing problem-based learning to improve the students' critical thinking in other subjects in Moroccan middle or primary schools. It will allow the students to become conscious of the social issues or study the impact of critical thinking skills in ELT (English Language Teaching). The findings of this researcher can also be used as a reference for future research.

## **3. Methodology**

### **3.1. Research settings and participants**

This research was conducted at TAZI Middle School (with school permission) in Casablanca, Morocco. The total of participants involved in this research was 50 students aged between 14 and 15 years. The level of students is intermediate and upper intermediate in the English language. The 9<sup>th</sup> graders and the researcher (teacher) collected the data through pre-test and post-test and analysed the results. The researcher administered a critical thinking pre-test to a control group (N=25) and an experimental group (N=25) to assess their higher order critical thinking skills; the test duration was one hour ( in an English session), and the test was based on a story completion to assess the creativity and critical thinking skills of students. The experimental group was taught using a problem-based strategy for 7 weeks; they received a treatment based on the story of Black Beauty by Anna Sewall (level 3 by H.Q. Mitchell-Marileni Malkogionni, mm. publications) that has 10 chapters, an activity section as well as a glossary. Gathering the data was through the correction of the pre-test and post-test for both groups, which will give the researcher an

accurate description and measure students' level of critical thinking. The researcher used a T-test to analyse the data and compare the score using SPSS. The experimental group students were introduced to the problems that the main character Darkie encountered during his harsh experiences with aggressive and savage masters. Accordingly, the story provides an effective opportunity for the students to read behind the lines and see the story as well as society in a critical eye; therefore, it enables them to talk about Animal rights in general and horses in particular (Darkie) through class discussions, working either in pairs or groups as well as writing creative writings based on PBL. Thus, the story analysis with students awakes their imagination and triggers their high-order thinking skills and analytical faculties and goes beyond regurgitating stories through picture analysis and character representations. The lessons of the chapters were taught through the following lesson plan:

Before reading	While reading each chapter	After reading each chapter
<ul style="list-style-type: none"> <li>•Ask students to guess what will happen in the chapter they are about to read</li> <li>•You can have the students predict</li> <li>•Ask the students to look at the illustrations of the chapter they are going to read: - what can you see in this picture? Where are the events taking place? What is happening?</li> <li>•Ask students to keep their books closed and listen carefully to the CD; ask them questions:                             <ul style="list-style-type: none"> <li>- Which characters appear in this chapter?</li> <li>- Where are they?</li> <li>- What are they talking about?</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>•Ask students to open their books. Play the CD again and ask them to read it along silently as they listen to it. Ask students some questions about the events, messages and plot of the chapter.</li> <li>• <b>Character card game as a tool of PBL</b></li> </ul> 	<ul style="list-style-type: none"> <li>•Divide the class into pairs or groups and get them to ask each other about the characters appearing</li> <li>•Ask students to suggest a suitable title for the chapter</li> <li>•<b>Problem based learning:</b> Imagine you were Black Beauty, and you received bad treatment from your master; how would you react? What would you do?</li> <li>•Did you like the story? Why? Why not?</li> <li>•Who do you think was the most interesting/annoying/likeable character? Why?</li> <li>•Would you like to have lived during the time the story takes place? Why? Why not?</li> </ul>

### 3.2. Interpretation for paired sample T-test

Table 1. Paired samples statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre-test control group	11,92	25	4,434	,887
	post-test control group	11,93	25	4,431	,886
Pair 2	pre-test experimental group	9,72	25	5,519	1,104
	post-test experimental group	14,68	25	5,006	1,001

The first table presents the mean scores of the pre-test and post-test for the control group and the treatment group (taught using problem strategy) after applying the dependent sample test. The mean scores of the control group during the pre-test ( $M = 11,92$ ,  $SD = 4,434$ ) and the post-test mean score was ( $M = 11,93$ ,  $SD = 4,431$ ), which means that the scores before and after the tests were not significantly different. However, the pre-test and after test scores for the treatment group were significantly different, as shown in **Table 1**; the mean scores of experimental groups during the pre-test ( $M = 9,72$ ,  $SD = 5,519$ ) and the mean scores in the post-test were ( $M = 14,68$ ,  $SD = 5,006$ ) which shows a considerable difference and significance.

**Table 2. Paired samples test**

		Paired Differences				t	df	Sig. (2-tailed)	
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower				Upper
<b>Pair1</b>	<b>Pre test- post-test control group</b>	-,010	,114	,023	-,057	,037	-,440	24	,664
<b>Pair2</b>	<b>pre test - post test experimental group</b>	-4,960	6,065	1,213	-7,464	-2,456	-4,089	24	,000

**Table 2** illustrates that the T value is far away from 0 (-4,089) and the significance value is small (sig <0.05), which means that students who were taught by the utilisation of PBL and reading stories reported a positive mood and performed effectively. These results illustrate that reading and analysing Blanc Beauty along with problem-based learning affect students' achievement in the post test; experimental group participants outperformed the students who took normal classes (control group).

**4. Results and discussion**

The study was conducted at Tazi School in Casablanca, Morocco. It investigates the effect of PBL and reading English stories in improving critical thinking skills. The findings illustrated that the treatment group participants outperformed and excelled in the post test; it also suggests that the level of critical thinking skills among students of the control group is low, and the scores of participants are beyond the average and show no progress.

Importantly, the implementation of short story analysis and the themes discussed through pair and group work helped the learners to upgrade their critical thinking skills. The researcher employed a strategic procedure based on a lesson plan that aims to help students analyse, interpret, evaluate and compare the answers with their partners to consolidate their understanding and improve their high order skills. Moreover, the research ( teacher) introduced some problems that happened in the story for students to find a clue, interpret, analyse and criticize, especially the sufferings and hardship that Darkie ( protagonist) suffered from. In chapter 4 (page: 23) and chapter 8 (pages 40-41), as shown in the pictures below ('CUSCO Catalogue 2021', 2021), students were motivated to analyse the messages the writer wanted to address and discuss the themes of animalism versus humanism and what can students, teachers, educators, policy makers and all citizens do to change and therefore raise awareness about cruelty and bad treatments towards animals and the violation of their rights:



The researcher addressed creative writings throughout the procedure as the following question: Imagine that you are the young lady who wanted to help Black Beauty. Describe in detail what you saw, what you said to the driver and how you felt. All in all, reading the story of Black Beauty based on PBL implementations throughout the 10 chapters helped learners develop their creativity, imagination and, most of all, critical thinking skills.

### 5. Limitation of the study

Despite its significance, this research used a small number of samples, so we can not generalize the findings. In addition, the researcher conducted this research in a particular Moroccan context; therefore, it will be difficult to generalize it in other contexts.

### 6. Conclusion

The objective of the study was to examine the effectiveness of problem-based learning and reading stories on students' critical thinking skills in Moroccan middle high schools. The results revealed that the implementation of problem-based learning and reading stories enhances students' critical thinking skills. Importantly, the implementation of critical thinking skills is bound to orient and lead students to learn how to think critically, seek credibility, and be good decision-makers and problem solvers. Furthermore, this study suggests that teaching critical thinking skills through reading short stories and PBL is effective and can promise positive results. This study demonstrates the fruitfulness of implementing problem-based learning and reading stories in ELT (English Language Teaching). However, it is difficult to generalise the findings due to the small number of samples as well as the one particular Moroccan context used in the study. The findings of this researcher can also be used as a reference for future research, and the investigation of problem-based learning and creative writing to improve the students' critical thinking in middle or primary schools for future studies will be fruitful.

**Funding:** This research received no external funding

**Conflicts of Interest:** The authors declare no conflict of interest

**Acknowledgements:** I would like to express my sincere gratitude to Professor Nawal Tazi and Maryam Tazi, the headmasters of Tazi School, for their support and permission to conduct this research. I want to thank Mme Mahjouba Kassa. I am grateful to my Professor and supervisor, Dr Sakale Sana, for introducing me to my field area.

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