

Developing Critical Thinking Skills of Secondary Students in Jordan Utilizing Monro and Slater Strategy, and McFarland Strategy

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Abstract: *The purpose of the present study was to investigate the effect of the Monro and Slater strategy and the McFarland strategy in developing the critical thinking skills of eighth-grade students in Jordan. The sample consisted of 209 eighth-grade students, divided into three groups: two experimental and one control. The California Achievement Test was used to measure critical thinking skills. The results of the study indicated significant differences between the control and experimental groups in favor of students in the experimental groups who studied via distinguishing between reality and opinion. The study concludes by offering a number of theoretical and practical implications for the field of study. Such implications include incorporating critical thinking skills in courses and providing training for teachers on how to use such strategies when teaching courses.*

In today's society, characterized by constant changes and competition, educators and employers are seeking students who are equipped with critical thinking skills to face challenges, to make the right decisions, to build an integrated personality capable of participating in a society, to share different point of views, and ultimately to solve national problems (Biajeh, 2002; Khalefh, 1990; McFarland, 1985). Critical thinking skills represent a persons' ability to assess knowledge, facts, and accuracy in topical analysis for any Gnostic assumptive or beliefs in regards to evidence that it supports to arrive at unharmed findings in clear and logical ways (Al-Zyadat, 1995). Gunn (1993) defined critical thinking as the mental process to evaluate individual thinking based on established evidence and laws. Elkins (1999) added that critical thinking may involve various components such as imagination, analytical, and cause and effect relationships.

Introduction and Theoretical Framework

To succeed and become competent, students should possess the needed critical thinking skills and utilize them in their daily lives, which may allow them to organize and evaluate the information they receive from reading books and by attending school. Researchers have mentioned a number of critical thinking skills that students should possess, such as being able to evaluate discussions, explain information, and test hypotheses (Watson & Glaser, 1991), distinguish facts, determine right answers from wrong answers, determine right resources, and the ability to make predictions (Beyer, 1995), solve problems, and evaluate performance (Billy, 2001). Moreover, critical thinking skills have been found to influence students' achievement (Alrabthy, 2004) and motivation (Jennifer & Jeffry, 2001).

Based on the review of previous research, the researchers noticed that few studies discussed the importance of utilizing modern teaching strategies aimed at developing students' critical thinking skills. Furthermore, previous research indicated that teachers are apt to use traditional teaching methods in their classrooms (Alziyadat, 2003). Traditional teaching methods that are based on providing information to students for memorization purposes, may negatively impact students' achievements (Alnabulsy, 1995). Based on this finding, educational personnel have developed new teaching strategies aimed at developing critical thinking skills for students such as the McFarland strategy, Smith Strategy, Orelly strategy, Byer strategy, and Monro & Slater strategy.

The importance of developing students' critical thinking skills via different teaching methods has been emphasized by few studies. For example, Lumpkin (1992) studied the

effect of direct teaching methods for developing critical thinking skills for 80 fifth and sixth-grade Social Studies students. The sample was divided into two groups: one group (experimental) was taught with a focus on critical thinking while the control group was taught via the traditional teaching method. The Cornell test for measuring critical thinking skills was applied on the two groups. The results showed no statistical differences in critical thinking skills for the students. Another study by Husny (2002) measured the effectiveness of teaching History utilizing the style of historical story in developing critical thinking skills for basic level students. The sample consisted of 120 second-grade students in Oman. The results indicated that there were statistical differences in favor of empirical groups taught by using historical story for testing the skill of correlated words. Alhusny's (2002) study investigated the effect of teaching history via story telling to develop the critical thinking skills of 120 tenth-grade students in Oman. The researcher divided students into one experimental group taught via story telling and one control group taught via traditional method. The results indicated significant differences in critical thinking skills on the posttest in favor of the experimental group.

Al-Zyadat (2003) conducted a study that investigated the effect of using Gnostic and the Search Pattern Teaching strategy for developing critical thinking skills for 310 ninth-grade students for a Geography course in Jordan. The results indicated the development of students' critical thinking skills when taught using the Gnostic and the Search Pattern Teaching strategy. Another study by Khasawneh (2004) attempted to develop critical thinking skills in a

history course for tenth-grade students utilizing basic teaching principles. The results indicated an improvement in critical thinking skills in the experimental group.

In short, to the researchers' best knowledge, previous research has not utilized combined teaching strategies to develop critical thinking skills on the national and international level. This research is the first study conducted in Jordan that examined the effect of using two strategies (The Monro & Slater strategy and The McFarland strategy) for developing critical thinking skills in eighth-grade students.

Statement of the Problem

Based on the premise that the development of critical thinking skills of students is a concern for academics and practitioners, this study was conducted to investigate the effect of using The Monro and Slater strategy and the McFarland strategy for developing critical thinking skills for all eighth-grade students in Jordan.

Research Question

The following question was formulated to achieve the purpose of the study: Are there any statistically significant differences ($\alpha=0.05$) in developing critical thinking skills for eighth-grade students related to strategy used and student gender and the interaction of the two factors?

Importance of the Study

The study's importance pertains to the fact that results will benefit teachers in utilizing effective teaching strategies to help students acquire

Table 1.

critical thinking skills. Moreover, the results can be employed to achieve educational development aims in Jordan that facilitate the development of different thinking abilities especially critical thinking skills.

Definition of Terms

The Monro and Slater Strategy: Procedures that distinguish between opinions and facts during classroom discussions.

The McFarland Strategy: Procedures that aim to present examples which help in teaching the skill of distinguishing between materials relates to topic and that doesn't.

Research Methods and Procedures

Population and Sample

The target population for this study included the census of eighth-grade students (N = 66,826) in the second district of Irbid who were registered for the academic year 2006-2007. This district was chosen because over the past 10 years it has shown to have an equal representation of students from all other regions in Jordan. According to Table 1, the sample included 96 male students and 113 female students selected via clustered random sampling technique.

Instrumentation

The researchers developed the second unit of the eighth-grade book with the title "Colonizing and freedom movements and independence in Asia and Africa" that included four lessons that discussed the following: colonizing, expending colonizing, freedom movements and independence in Asia and in Africa.

The Spread of Student Population According to School, Class, and Gender.

Gender	School	Students	Class
Male	66	34,818	1,073
Female	91	32,008	1,142
Total	157	66,826	2,215

The researchers determined the teaching objectives for the content for three levels: cognitive objectives, psychomotor objectives, objectives related to developing critical thinking skills, and objectives related to values and beliefs related to critical thinking. This content was developed according to the following strategies:

(1) Monro and Slater Strategy:

Unit questions developed to distinguish between facts and opinions according to the following steps: naming skills, appointing the lesson topic, defining the skill (students' ability to distinguish between facts and opinion), the teacher and the student determine skill characteristics (it is a sentence that specifies that a fact can be proved), using general questions as an introduction to the lesson (e.g., which of these sentences can be considered fact or opinion?), suggesting activities that students perform for each unit, asking students to classify it into facts and opinions, and students suggesting additional activities outside the classroom.

(2) McFarland Strategy: Unit lessons were developed according to the following steps: naming the skill (students determine correlated and non-correlated words), determining lesson topic, defining the skill (it is the ability to determine correlative words in a group of vocabulary that has shared attachments, and combining it in one phrase to suit the lesson topic after deleting the non-correlated

words. The teacher and students determine concepts and characteristics found in skill definition, asking general questions (e.g., what data can help us more than other? What data benefit us more than others? What data do we need? What is the necessary data? What is un-functional in the context? What can be proven?), giving examples for students such as earth, government, people, relationships, and rules, and giving questions about these words, suggesting that students read the lesson and make an example, and suggesting additional activities for students by giving them another group of words.

Validity of the Unit

The researchers ensured the validity by using a Jordanian panel of experts (n = 12) who have expertise in social studies curricula, teaching methods, instructional design, and evaluation and assessment. These judges were presented with the content and asked to provide to what extent the content of the developed unit fits eighth grade students' level with regard to adequacy of objectives, its diversity and formalizing in the unit in general, and relevance of activities for each lesson in the unit, and the extent of fitting these activities and tasks. In addition, the panel of judges was asked to determine if each strategy is represented adequately in the developed unit, the importance of the existence of special instructions for

teachers and students at the end of each lesson, and the ideas of sequence and the clarity of language. The judges indicated that the content fit to the standard and few changes and modifications were incorporated into the unit.

California Test for Critical Thinking Skills Pattern (2000)

The researchers used the California Achievement Test for assessing critical thinking skills that Al-Rabady (2004) modified for the Arabic environment, which was found to be valid and reliable.

Test for Validity

The test was administered to a group of 11 content judges who have expertise in the area of instructional design, teaching methods, and measurement and evaluation. The

content judges were asked to provide their opinion with regard to linguistic safety for formalizing the test items, and its appropriateness for administration in the Jordanian environment. Their comments were taken into consideration and items were adjusted accordingly. The test consisted of 34 items distributed on the five skills of critical thinking as shown in Table 2.

Test for Reliability

To test for reliability, the test was piloted with a group of 25 male students and 20 female students who were excluded from the sample of the study. The test was administered as a pretest and after two weeks was administered as a posttest. Table 3 illustrates the Cronbach Alphas for the factors.

Table 2.

The Distribution of Test Items on the Dimensions of the Critical Thinking Skills.

Number	Skill Name	Items
1	Analyzing	6
2	Inducing	6
3	Concluding	4
4	Deducing	12
5	Evaluation	6
Total		34

Table 3.

Cronbach Alphas for the Test of Critical Thinking Skills.

Number	Skill Name	Crobach Alpha
1	Analyzing	0.79
2	Inducing	0.82
3	Concluding	0.87
4	Deducing	0.83
5	Evaluation	0.84

Correct California Test for Critical Thinking Skills Pattern (2000)

The test consisted of 34 multiple-choice items distributed on five skills. The researchers used one point for a correct item and zero for incorrect items. By that the total grade ranged between (0-34).

Data Collection

The researchers visited the selected schools for the study, explained the nature and purpose of the study, and gained permission to administer the study on school campus from principals. The researchers applied the California test for Critical Thinking Skills to the selected groups (experimental and control as a pretest). The selected teachers utilized the Monro & Slater strategy and the McFarland strategy after they had been explained in detail how to administer the test by the researchers. During the data collection, the researchers supervised each teacher frequently. Upon the completion, the California Test for Critical Thinking Skills was given to the students as a posttest. The researchers gathered the data at the schools.

Data Analysis

To answer the research question, the researchers utilized means, standard deviations, two-way ANCOVA, and Scheffe test for post comparisons. The Statistical Package for Social Science (SPSS) version 11.5 was used to analyze the data. A .05 alpha level was set as priori.

Results

The research question was: Are there any statistically significant differences ($\alpha=0.05$) in developing critical thinking skills in eighth-grade students related to strategy and gender and the interaction between the two factors? To answer this question, means, adjusted means, and standard deviations were calculated for the pretest-posttests of the teaching strategy and according to the variation of teaching strategy by gender (Table 4).

According to Table 4, there were statistical differences between total mean scores on the critical thinking post-test. To check the statistical denotation for that difference, two-way ANOVA statistical analyses were utilized (Table 5).

As can be seen in Table 5, statistical differences were found between means for total degree of critical thinking test related to the effect of teaching strategy. This reveals the efficiency of the used strategy in teaching the experimental groups. Therefore, the Scheffe test was used for post-comparison (Table 6).

Table 6 illustrates the statistical differences between the means of teaching strategies in favor of teaching strategy (distinguishing between fact and opinions) with a mean of 24.98 versus a mean of 22.56.

Table 4.

Means and Standard Deviations for the Total Degree on Pre and Post Critical Thinking Test in Addition to Adjusted Means According to Gender and Strategy.

Teaching Strategy	Gender	Procuring				Adjusted Mean
		Pre		Post		
		Mean	Standard Deviation	Mean	Standard Deviation	
Distinguishing between Truth and opinion	Male	13.06	1.79	25.32	3.04	25.34
	Female	14.13	1.66	24.63	2.51	24.63
	Total	13.58	1.80	24.89	2.80	24.98
Correlative words	Male	15.44	2.31	22.35	2.37	22.34
	Female	13.31	1.89	22.78	2.65	22.79
	Total	14.52	2.38	22.54	2.49	22.56
Traditional	Male	14.10	1.70	22.29	1.90	22.29
	Female	14.54	2.02	23.77	2.40	23.77
	Total	14.33	1.88	23.08	2.29	23.03

Table 5.

Two-Way Results for Statistical Differences.

Source	SS	DF	MS	F Value	P value
Gender	3.209	1	3.209	0.511	0.07
Teaching Strategy	244.712	2	61.178	9.745	0.111
Gender × Strategy	44.911	5	11.228	1.789	0.22
Error	1958.67	312	6.278		
Total	2251.757				

Table 6.

Post-Hoc Comparison Scheffe Test on the Critical Thinking Skills.

		Adjusted median		
		Distinguishing between fact and opinions	Correlative Words	Traditional
Teaching Strategy	Mean	24.98	22.56	23.03
Distinguishing Between Fact and Opinions	24.98	-	2.42	1.95
Correlative Words	22.56	-	-	- 0.47
Traditional	23.03	-	-	0.66

Discussion

The purpose of this study was to investigate the effect of the Monro & Slater strategy and McFarland Strategy for developing the critical thinking skills of 209 eighth-grade students in Jordan. The study utilized a quasi-experimental design with two experimental groups and one control group. The results of the study indicated significant differences between the control and experimental groups for the favor of students in the experimental groups who studied via distinguishing between reality and opinion which is at the center of the Monro and Slater strategy. These results are justifiable because this strategy (distinguishing between fact and opinion) (a) enables students to process learning in an active manner and encourage students to interact with each other inside and outside the classroom, (b) directs students to pay more attention to the class content and to have more desire to think, to participate effectively, and to gain independence in casting facts, opinions and ideas. This allows students to become more flexible and active in presenting facts, opinions, and ideas inside the classroom, (c) directs students and encourages them to look for external readings while reading school books, (d) improves students' performance utilizing a higher level mental process which allows students to use their mental analytical thinking and commitment to the strategy that ultimately leads to improvements in students' critical thinking skills, and (e) stimulates students' brains to navigate through various thinking situations, which require high levels of classification and analyzing skills, ultimately leading to development of an infinite numbers of thinking skills. The results of this study are consistent

with that of Khlefah (1990), Al-Zyadat (2003), and Al-Odat (2006).

With relation to the effect of gender, the results revealed that there are no statistical differences between the average performance of males and females. This result can be justified by the fact that both males and females receive the same educational curriculum, training and preparation in the same educational, social, and economical environments. This result agreed with studies conducted by Al-Zyadat (2003) and Al-Shbul (2004) which arrived at the same conclusions. However, this result differed with the following studies: Al-Ajoulune (1994) and Al-Nwayseh (2007) studies which indicated that females score higher, because females are more eager for answers and respond in a positive way for estimating. Moreover, the results showed that there were no statistical differences in developing critical thinking skills during a History course related to the interaction between method and gender. So the use of the two strategies has a positive effect with students (male/ female) in developing critical thinking skills. Also, these results can be justified by the fact that students have one educational attitude, and that the students study in the same governmental schools and all of that leads to the non-existence of interaction between teaching style and gender. This study agreed with that of Al-Zaydat (2003) and Al-Shbul (2004) which asserted the same results.

Recommendations

In the light of the current study results, a number of theoretical and practical recommendations are provided. From the theoretical standpoint, (a) this study should be replicated with all secondary students in Jordan representing various regions,

(b) other researchers should study the effect of multiple teaching strategies in developing critical thinking skills, and (c) a study should be conducted to determine the antecedents and consequences of critical thinking utilizing advanced statistical analyses such as structural equation modeling.

From the practical standpoint, (a) critical thinking strategies should be incorporated into secondary curriculums related to history courses, (b) social studies teachers should be trained and guided on the best way of utilizing effective teaching strategies into their classroom, (c) suitable environments should be provided to students to allow them develop their critical thinking skills, and (d) design programs for teaching critical thinking skills for school students at the Ministry of Education.

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Critical thinking is the engine of learning. Within this complex process or so many other relevant themes that contribute to learning: creativity, analysis, evaluation, innovation, application, and scores of other verbs from various learning taxonomies. So the following infographic from Mentoring Minds is immediately relevant to all educators, and students as well. At the bottom, it pushes a bit further, however, offering 25 critical thinking strategies to help support progressive learning. The best to develop critical thinking is to engage in a classical education with language analysis (via Latin), syllogistic logic, and the analysis of literature. An added benefit is that it tends produce virtuous young people. [Vote Up](#)[Vote Down](#).