

The Effect of Cognitive Learning Style-Based Reading Program on the Achievement of Jordanian Freshmen English Majors

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Abstract

The purpose of this study was to investigate cognitive learning style-based reading program on the achievement of Jordanian freshmen English majors. The subjects of the study consisted of 104 freshmen English majors enrolled for Reading Skills 1 in Tafila Technical University in Jordan in the fall semester 2007/2008. Students' learning styles, analytic and global learning styles, are identified based on Felder and Soloman (2006).

The subjects were divided into two groups and were alternatively exposed to their matching and mismatching analytic and global styles. The instructional programs contained 12 reading passages. The activities that followed these passages were developed in two ways: one for the analytic style students, and the other for the global style students. The reading achievement test was administered twice, at the beginning and at the end of the program, for measuring the students' achievement before and after the experiment. The two-way ANOVA test was performed to measure the interaction effect between the instructional strategy and the cognitive learning style on students' achievement.

The results revealed that there were no statistically significant differences in the students' mean scores on the reading achievement test between the analytic learning style group and the global learning style group due to the instructional strategy or the learning style. However, the only factor that affected students' achievement and motivation for reading in English was the interaction between the instructional strategy and the cognitive learning style. In light of these findings, the researcher offered recommendations for further research and for EFL reading educators.

Keywords: Cognitive learning, Learning style, Reading comprehension

1. Introduction

Reading is a core receptive skill that foreign language learners utilize to gain input for learning a language or any other subjects inside or outside the classroom. It lies at the heart of any language learning process because it offers an open window to further knowledge, learning and development. In today's information rich and technologically advanced society, learners can travel to far-off lands to explore what is happening in the world by reading electronic journals and websites.

Students' academic success in school, as well as the success they will achieve in their adult life significantly depends on their ability to read. Good readers are more likely to achieve better at the university level than poor readers do.

Despite its importance, Jordanian university students view English reading as an academic subject. The researchers' interviews with English majors at three higher education institutions, Mu'tah University, Zarka Private University, and Tafila Technical university, revealed that the majority conceive of English reading for narrow academic purposes, and few make minimal use of the library and read magazines and newspapers written in English. None read the *Jordan Times*, for example.

Furthermore, a major area of failure by English major students is that of reading comprehension. According to the interview, English language instructors in their respective departments at the said institutions stated that English

major students are unable to identify the author's points of view to differentiate facts from opinions, to evaluate the authors' views, and to draw conclusions.

The techniques of teaching English are central to the problem. Al-Makhzoumi (1986) stated that most of the reading teaching techniques focus on teaching the meanings of vocabulary items in the text and the accurate pronunciation of unfamiliar items; very little emphasis is given to reading comprehension. So, the "one-size-fits-all" method falls short of teaching all students, all subjects, and all skills.

Additionally, the mismatch between the instructional strategies the instructors use and the learning styles the students prefer may be construe the learners' failure in reading comprehension. In support of this interpretation, Felder (2006) pointed out that when a mismatch exists between learning styles of students in a class and the teaching style of the instructor, learners may become bored and inattentive in class, do poorly on tests, feel discouraged about the learning process, and in some cases drop out of school. One of the major findings in a study by Khanji (1997) was that 80% of the University of Jordan's students expressed unfavorable attitude towards reading courses. Al-Zoubi (2005) also found that 80% of the college-level students (N=300) agree that lecture format is the most common method the faculty of the Educational Sciences at Al-Hussein Bin Talal University use.

In conclusion, traditional lecture is the most common method of teaching students at the college level, and students' learning preferences are rarely respected under this mode of delivery; a disconnect exists between the techniques the instructors use and the students' learning preferences. It is like teaching the blind with pictures and the deaf with spoken words.

2. Review of Related Literature

Extensively reviewed theoretical and empirical literature address the concept of learning styles, holist versus serialist or global versus analytic and with studies that compare the achievement of the two types of learners, analytic and global, in reading and other academic subjects. Studies of (Pask, 1976; Schmeck, 1988; Oxford 1990; Chapelle, 1995; Felder and Soloman, 1995; Smith, 1995) agree on a bipolar division of the learning style and provide intensive descriptions on the way the two types of learners approach knowledge in the classroom and in real life situations.

According to Pask (1976), holist learners learn in layers, like having a map, knowing where they are heading and what they are working toward. They enjoy having examples shown to them even if they are not capable of imitating the skill yet. However, holist learners sometimes get confused by step-by-step instructions, tend to pick up bits and pieces within a broad framework and may leave gaps, repeat themselves and overgeneralise. They may also be more comfortable with "topic" based learning. On the other hand, serialist learners find introductory overviews distracting and confusing. They expect to learn whatever they are shown immediately or they become frustrated because they don't have the ability of the global learner to see 'the big picture'. They prefer to proceed step-by-step, in an orderly way, to the end result. They build their knowledge sequentially, they are impatient with 'jumping around' and they may lose sight of the broader picture. They may be more comfortable with inherently 'linear' subjects. Serialist learners are in the majority, and most educational materials are laid out in a sequential rather than a global way. According to Ellis (1989) global learners prefer experiential learning and learning through communication whilst analytic learners prefer formal, individual learning in a classroom environment.

Schmeck, (1988), however, views cognitive style as developmental, proceeding from global to analytic. Learners are able to develop an integration of the global and analytic models. Teachers should teach strategies which apply to different learning tasks, allowing students to approach learning tasks analytically or globally. He maintains that versatility in cognitive functioning is the goal of education.

In the discipline of language learning, Oxford (1990) states that left-brain (analytic) thinkers deal more easily with grammatical structure and contrastive analysis, while right-brain (global) thinkers are better in learning language intonation and rhythms. Chapelle (1995) also suggests that the analytic learners are able to analyze the linguistic material they are exposed to, to distinguish the components, and then, perhaps, to investigate relationships between these components. Holistic learners, on the other hand, are more likely to perceive situations as wholes; therefore, they are more likely to profit from communicative interactions that maximize chances for receiving high quality and relevant input, and that allow these learners to engage in opportunities to use language to express meanings.

Additionally, Carbo (1996) states that the analytic-reading style students like reading to be taught as a sequence of discrete skills to be mastered one-at-a-time. Yet, when they are taught such discrete skills out of a meaningful context, many of them eventually get into the habit of reading only for information retrieval. Consequently, they miss many of the ideas implied in a text. She adds that the global reading style students like reading whole texts and expand what they read in writing whole texts. Students who learn best with phonics instruction have analytic reading

style. As a result, the logic of phonics makes sense to them. She further mentions that for an analytic learner, a program based exclusively on whole language can seem disjointed and haphazard. Conversely, students who benefit most from a whole language program have global reading style.

Riding and Reid (1996) claim that holists take a global, top-down view of information whereas analytics break information down into its component parts. They add that holists tend to prefer a “breadth-first” structure which gives an overall view of a topic before introducing detail whereas analytics prefer a “depth-first” approach where each topic is explored fully before moving onto the next one.

3. Experimental Studies

In her study, Kaley (1977) found that of the good readers, half were analytic and half were global. Of the poor readers, 85% were global. She concluded that good readers were field independent (analytic) because they could see each letter, sound it out individually, and piece it together with others to form words. She also found that a large majority of educators are analytic processors whereas many students at any level are global processors.

Trautman (1979) investigated the relationship between selected instructional techniques and cognitive style. He used Contract Activity Packets (CAPs) with junior-high school social studies classes. Half the objectives were written analytically and half were written globally. Each student completed all the objectives. Trautman's findings indicated that the groups matched with their processing styles achieved statistically higher gains on those objectives than on the objectives written in the unmatched style.

Spires (1983) investigated the effect of a learning style-based program on the reading achievement of students from 3 to 6 grades. Analyses of the data indicated that teaching students through their individual learning styles resulted in significantly higher reading achievement, particularly on those subtests requiring higher level cognitive abilities, such as reading concepts. The results of the study revealed gains in students' achievement in reading and mathematics on standardized achievement tests.

Lyon (1991) conducted a study at Washington State University to determine if there was a relationship between teaching styles and learning styles in a real-life adult learning situation. Lyon investigated the assumption that adults whose learning style matched the instructor's teaching style would gain more knowledge than others with a different learning style. No significant difference was found between knowledge gain and a match of the teaching styles of the instructor and the learning styles of the participants.

Sudzina (1993) investigated the relationship among reading styles, instructional methods, and reading achievement among a group of second-graders. Sudzina concluded that many teachers of young readers were unaware of the influences of learning preferences upon success. Often times, teachers address one or two learning style preferences. Thus, students who were not good readers had less chance of succeeding because, often times, their reading styles were not addressed.

Spoon and Schell (1998) conducted a study to find out the effect of aligning student learning style with instructor teaching styles on 12 teachers and 189 students at a technical school. The lack of significant differences between the congruent and incongruent groups on academic achievement does not support some of the other research conducted in this area. One plausible explanation for the disparate findings is that adult learners may be more flexible in their learning styles and able to adapt more readily to different teaching styles. Adults have had years of experience in learning in different school settings and may be more tolerant of differences in teaching methodologies. Further, adults may have learned how to learn in accordance with the different styles of teaching.

El-Koumy (2001) investigated the effect of matching vs. mismatching instructional approaches with analytic and global learning styles on EAP students' reading achievement. The subjects of the study were 94 graduate students enrolled in the higher Diploma in Education at Suez Canal University during 1999/2000 academic year. The results of the study revealed that students whose global and analytic learning styles were mismatched with instructional approaches showed greater achievement in reading comprehension than those students whose learning styles were matched. Based on these results, El-Koumy concluded that analytic and global learning styles operate as complements rather than substitutes for each other and that the reading comprehension of analytics and globalists can be improved if they are taught with an instructional approach that complements their learning style. He also concluded that the results of his study support the interactive theory which views reading as neither a bottom-up nor a top-down process, but as an interactive process between the two.

Mohamed (2004) conducted a study to find out the effect of matching/mismatching teaching and learning styles on secondary stage students' achievement in English as a foreign language. He used Grasha's learning and teaching styles inventories in his study. His subjects were 331 secondary stage students in one of the public schools in Egypt and ten EFL teachers. The results of the study indicated that there were significant differences between the mean

scores of the matched and mismatched groups in their achievement in favor of the matched groups.

Abu Romman (2005) investigated the effect of match/mismatch of teaching/learning styles on Jordanian secondary stage students' achievement in English. Eight hundred and three students and twenty EFL teachers participated in the study. He used Grasha's (1995) learning styles Questionnaire, which divides the learning styles into passive, dependent, cooperative, participant, competitor, and independent, to identify the participants' learning styles. An English language achievement test was developed and administered after conducting the experiment to find out students' level of achievement in reading comprehension, writing ability, grammatical structures, and knowledge of vocabulary. The results of the study revealed that there were significant differences between the mean scores of the matching and mismatching classes in favor of the matched ones. The results also revealed that matching teaching and learning styles had a positive effect on students' attitudes towards English.

Daoud (2008) investigated the effect of students' perception and matching instruction with cognitive style on secondary stage students' achievement in English literacy skills in Jordan. The subjects of her study consisted of one hundred and twenty female students divided into four groups. They were purposefully chosen from a high school in Amman, Jordan. She used the Group Embedded Figures Test (GEFT) to identify the students' cognitive style as Field Dependant or Field Independent. She also designed an instructional program that matched students' cognitive styles and prepared an achievement test of English literacy skills. The results indicated that the only factor that affected students' achievement in English literacy skills was matching instruction with their cognitive styles.

In conclusion, analytic and global learning styles are described as opposites. In light of the unique characteristics of each style, authors like Felder (2006), Ford and Chen (2001) and Kinsella, 1995 assert that matching teaching strategies with these two learning styles in particular and all learning styles in general improves learning, attitudes, and motivation. They further assert that teachers should try to accommodate all learning styles and they should do that even if it conflicts with their idea of what is effective in the classroom.

Others like Rush and Moore (1991), Spoon and Schell (1998), and Vaughan and Baker (2001) claim that the best learning outcomes occur when instructional techniques mismatch learning styles. They also claim that mismatching can help learners to overcome weaknesses in their cognitive styles and to develop a more integrated approach to learning. They further claim that students learning styles refer to the usual, rather than the most effective processes, therefore, these learning styles may not fit the learning situation. They add that teachers should train students in their areas of weakness through different teaching strategies and different teaching materials.

The previous review of related literature revealed that most of the studies related to the learning styles were conducted on populations of primary and secondary school students and that those studies used multi-dimensional inventories to identify students learning styles. These dimensions embraced perceptual, environmental, social, affective, and cognitive factors which seem very difficult to match or mismatch in one study. Since the findings of these studies cannot be generalized to university students, there seems a need for coordinated research efforts specifically targeting university students.

4. Statement of the Problem

The purpose of this study is to investigate the effect of a cognitive learning style-based reading program on the achievement of Jordanian freshmen English majors.

Questions of the Study

The study raised the following questions:

- 1) Is there a difference in the achievement of the Freshmen English majors that can be attributed to their cognitive learning style (analytic and global) and to the reading instructional strategy (analytic and global) they receive?
- 2) Is there an interaction between the instructional strategy and the cognitive learning style on the reading achievement of Freshmen English majors?

5. Significance of the study

The present study introduced an attempt of matching instructional strategy and learning style. It is hoped that the study would provide other researchers with some validated and reliable instruments, action procedures, and experimental findings for being reused, replicated, or relied on in further research.

The study provides teachers with some implications and insights for teaching reading in the Jordanian context. It also explores students' acceptance and receptivity of the proposed strategies. The study should encourage educational decision-makers, educational supervisors, and colleges of qualifying and preparing prospective teachers to make use of and promote a variety of procedures to facilitate the introduction of a match between the instructor's instructional strategies and their respective students' learning styles.

The study should gear more research towards the design of the instructional strategy and learning style or any of its variations and its actual effectiveness on comprehension, achievement, and problem solving in other subjects, as well as towards the teachers' satisfactions with the model or any of its variations.

6. Operational Definitions

The following concepts and terminologies are operationally defined as follows:

Reading Comprehension Achievement refers to the students' progress in reading comprehension as represented by their scores on the posttest.

Instructional Strategy refers to a set of teaching activities that contains explicit steps to achieve specific student outcomes. It is limited to two levels (analytic and global).

Cognitive Learning Style refers to the way the learners process information; it varies from analytic to global.

The Analytic Learning Style is the dimension of cognitive style through which learners focus on details and remember specific information about a topic.

The Global Learning Style is the dimension of cognitive style through which learners enjoy getting the main idea and communicating even if they don't know all the words or concepts.

Limitations of the study

The findings of this study should be confined to the size of the study sample representing the Freshmen English majors at Tafila Technical University. Another limitation is the validity and reliability of the instruments the researcher used for the purposes of the study.

Method and procedures

Subjects

The subjects of the study consisted of all Freshmen English majors (N=104) enrolled in the Reading Skills 1 in the fall semester 2008.

Instruments

This study involved the use of an analytic and global learning styles inventory, an instructional reading program with two strategies, analytic and global, and a reading comprehension achievement test.

The analytic and global learning styles inventory

The researcher developed a learning styles inventory (see appendix B) for the two styles (analytic and global) based on Felder's and Soloman's (2006) Learning Style Questionnaire and More's (1993) Learning Style Identification Scale. This learning style inventory was composed of 20 bipolar statements (twenty items for each style) plus an open-ended question which required students to describe their ways of reading.

To establish the content validity of this instrument, comments and criticism on the original draft of the instrument were solicited from 7 professors of reading and literacy. Each reviewer was asked to comment on the suitability, sensitivity, exhaustiveness, and accuracy of the items of the two dimensions of the instrument. Based on the reviewers' written feedback, the investigator completed the instrument; two items in the negative form were added for controlling the students' prejudice. An example was given beforehand for guiding the subjects in how to fill in the questionnaire. Three items were replaced at the request of the panel of judges.

This instrument in its Arabic version was tested on a group of 15 students. The purposes of piloting were to estimate the time needed for completing the instrument, and to measure the instrument reliability. The reliability of the questionnaire was determined by using the K-R 20 formula which indicates the alpha was 0.80. The students' responses on the open-ended question in the inventory also revealed high degree of internal consistency between their responses to this question and their responses on the bipolar dimension items respectively.

The instructional program

The researcher developed two instructional reading programs. Each of these two programs was composed of twelve reading passages. The twelve reading passages which covered the whole semester were chosen from a variety of sources such as newspapers, magazines, and advertising materials. In selecting the reading passages, the following factors were considered: a reading text should contain a reasonable amount of new information, should contain appropriate syntactic structures, should be clear and rhetorically organized, and should not be too long or too short.

The activities that followed these passages were redeveloped in two ways: one for analytic learners, and the other for global learners. The analytic learners-based reading passage used the analytic reading strategy which

substantially involves linking sentences, changing complex sentences into simple ones, analyzing the writer's style, analyzing the features of cohesion in the reading text (e.g. reference pronouns), and analyzing the structure of various types of reading text.

Also, the global learners-based passage used the global reading strategy that exclusively depends on predicting, skimming, scanning, evaluating the text, writing summaries, and expanding the text.

To establish the content validity of these instructional programs, comments and criticism on the original draft of the instrument were solicited from six reading instructors from the English Language and English Education departments at TTU and Mu'tah University. Based on the reviewer's written feedback, the investigator completed the reading programs; each reading passage was reduced into five paragraphs, and each lesson was limited into five behavioral objectives, and one of the passages was entirely replaced by another which was seen more relevant to the students' social and everyday life to maintain their interest.

The reading achievement test

The reading achievement test consisted of a reading comprehension passage, and 10 multiple choice questions following it. It was administered before and after the experiment. The purpose of the pre-administration was to achieve equivalency between the study groups, and the post administration aimed to detect the effect of instructional strategy and cognitive learning style on students' achievement and the interaction effect between the instructional strategy and the learning style. The objectives of the test were based on the objectives of teaching reading to Freshmen English majors. The test instructions were written in simple English to match the subjects' level of proficiency.

To establish the content validity of this instrument, comments and criticism on the original draft of the instrument were solicited from two university professors and two EFL instructors from the Department of Curricula and Instruction at Mu'tah University and Tafila Technical University. Based on the reviewers' written feedback, the test was relevant to the students' level, the time of the test was quite appropriate, and the instructions were satisfactory. The reliability of the test was determined by using the K-R 20 formula which indicates the alpha was 0.81.

Study procedures

The following procedures were carried out for conducting the study: (a) upon obtaining the consents of Tafila Technical University and the subjects of the study, the analytic and global learning styles inventory was administered. (b) Based on the subjects' results on the pre-administration of the inventory, they were divided into four groups, analytic style group received analytic instruction, global style group received global instruction, analytic style group received global instruction and global style group received analytic instruction.

The subjects' responses on the inventory were analyzed. All 'a' items were analytic style and 'b' items were global style. Students who chose twenty one 'a' or "b" items were classified as analytic/globalist respectively. Students who chose less than twenty one were classified as undecided (had no preference). Fifty nine students showed analytic learning style preference and thirty seven showed global learning style preference. Eight students were undecided and, therefore, their test papers were excluded.

The results of the analytic and global learning styles inventory indicated that 56.73% of the subjects were analytic style learners, 35.58% were global style learners and 7.69% were undecided. (c) The comprehension achievement test was pre-administered. The test consisted of a reading comprehension passage and 10 multiple choice questions following it. Each question earns one score. (d) The test was scored by three English language instructors for further reliability. (e) The results of the students' responses on the reading test showed that the groups of the study started the experiment with equivalent reading knowledge and skill. (f) The instructor, who implemented the reading programs, was trained on the most effective procedures for teaching analytic and global learning style students. He was oriented to introduce the objectives of each lesson and the instructional activities that follow the reading passages. He was asked to use the analytic instructional strategy with the analytic learning style students and the global instructional strategy with the global learning style students in the first six weeks. In the following six weeks, he was asked to reverse the delivery procedure (teaching the analytics with the global instructional strategy and the globalists with the analytic instructional strategy). (g) Upon completion of the experiment, the achievement test was re-administered to the four groups of the study.

7. Research Design and Statistical Analysis

This study adopted the 2*2 factorial design with four treatments. X1 represented instructional strategy with two levels (analytic and global); and X2 represented two cognitive learning styles (analytic and global). The subjects of the study were assigned to four groups based on the analytic/global learning style inventory.

T-test and two-way ANOVA procedures were performed to analyze the data collected on the reading achievement test. The Independent variables were the instructional strategy of two levels (analytic and global) and the cognitive learning style as identified by the inventory (two levels, analytic and global). The dependent variable was the reading achievement as measured by the pre- and posttests.

8. Findings of the Study

The present study attempted to examine the effect of a reading instructional strategy and the cognitive learning style on the reading achievement of the Freshmen English majors. The analytic and global learning styles inventory was administered before and after the experiment. Based on the subjects' results (104 Freshmen English majors) on the inventory (pre-administration), they were divided into four groups, analytic style group received analytic instruction, global style group received global instruction, analytic style group received global instruction and global style group received analytic instruction. Students' reading achievement was measured through a reading achievement posttest.

The results of the pre-administration of the learning style inventory showed that 59 students were analytic and 37 students were globalists. Eight students were undecided.

Additionally, the achievement test was pre-administered to detect any differences in the knowledge of both groups before they started out the experiment. Table 1 shows the results of the 2-way ANOVA procedure for both groups on the pretest (see annex A).

The results of Table 2 indicate that the F value of both groups on the achievement test is 1.43 and insignificant at the 0.05 level (Annex B). This means that both groups started out the experiment with equivalent knowledge.

To answer the first question of this study, the students' scores on the reading achievement posttest were tabulated for both the analytic and global groups. T-test was performed to detect any differences between the achievements of both groups on the reading achievement posttest. Table 2 shows the results of both groups, analytical and global, on the achievement posttest.

Table 2 shows that there is no statistically significant difference $\alpha = 0.05$ between the mean scores of the analytic learning style group and the global learning style group on the reading achievement posttest that could be attributed to the instructional strategy.

The means and standard deviations of the analytic style group on the achievement posttest were 8.08 and 0.99 and the means and standard deviations of the global style group were 8 and 1.15 respectively. The T-value is insignificant 0.38, $p = 0.70$ $\alpha = 0.05$ which indicates that the instructional strategy did not impact the achievement of both the analytical and the global learning styles groups.

Findings related to question two

The second question raised was whether there existed an interaction between the instructional strategy and the cognitive learning style on the reading achievement of Freshmen English majors. To detect any significant interaction effect between the instructional strategy (analytic and global) and the cognitive learning style on the achievement of the freshmen English majors in the posttest, two-way ANOVA was performed. The results are tabulated in Tables 3 and 4 (Annexes C and D).

Table 2 shows that the means and standard deviations for the analytic group matched with analytic strategy are 8.39 and 0.88. The mean scores and standard deviations for the global group with analytical strategy were 7.79 and 1.26 respectively. However, the means and standard deviations for the global group with global strategy were 8.30 and 0.92. The means and standard deviations of the global group with analytic strategy were 7.53 and 0.94. The means and standard deviations for the total analytic strategy were 8.08 and 0.99 and for the global were 8 and 1.15. This indicates that the means of the matched strategy- group (analytical-analytical, and global – global) outperformed the unmatched strategy-group (analytical-global and global-analytical) on the achievement posttest. To detect the significance of the difference between the matched strategy-group and unmatched strategy-group, 2-way ANOVA procedure was performed. Table 4 shows the results of the 2-way ANOVA of the interaction effect between the instructional strategy and learning style on the achievement posttest.

The results in Table 4 indicate that the F value is 10.15 for the interaction between the instructional strategy and the cognitive learning style and it is statistically significant at the level of $\alpha = 0.05$.

Figure 1 shows that there is an interaction effect between the instructional strategy and the cognitive learning style on the students' mean scores on the reading achievement posttest.

9. Discussion

The study revealed three major results: (a) 57% Jordanian freshmen English majors showed analytical preference,

37% showed global preference, and 8% were undecided for their learning preference; (b) no statistically difference existed between the analytical and global learners' achievement on the reading posttest due to the instructional strategy they receive (analytical and global); and (c), the results indicated that there was a statistically significant difference noted in terms of the interaction between the instructional strategy and the cognitive learning style on the reading achievement of the Freshmen English Majors.

The first result of this study goes with a valid learning principle in the reviewed literature stating that learners have either analytic or global preferences for learning. The undecided 8% indicate clearly that other preferences between the two extremes of the learning style dichotomy exist. The difference in the percentage of the learners' distribution on the learning style dichotomy (57% analytical versus 37% global) may be attributed to the lack of randomization of the subjects into the two classrooms.

Again, this result is in line with Schmeck (1988) who believes that the cognitive style is developmental and versatility in cognitive functioning is the key to education. It validates the results of Kaley (1977) who investigated field dependence versus field independence and found that of the good readers, half were analytic and half were global. Sadler-Smith (2001) stated that it may be that knowledge of learning styles makes students better able to adapt to different situations.

The second result of this study showed that most freshmen English students at Tafila Technical University preferred the instructional strategy that accommodated their learning style. This finding might be attributed to the fact that the students relied on the instructor and did what he asked them to do; they were interested in developing competency in relation to others. Perhaps, the instructor raised his students' awareness of their learning styles and the students felt of no inferior or superior style for learning. Also, the result may be attributed to the students' broad understanding of learning environment and learning style which enabled them as adult learners to take control of their learning and to maximize the potential for learning.

This result is in line with the findings of Sudzina (1993), Abu Romman (2005) and Daoud (2008). The results of these studies indicated that overall academic achievement of students whose learning styles have been matched can be expected to be higher than those of students whose learning styles have not been accommodated. Further, when instruction is compatible with students' learning style preferences, the overall learning process is enhanced. It supports the results of Daoud (2008) which indicated that the only factor that affected students' achievement in English literacy skills was matching instruction with their cognitive styles. However, it is not in line with El-Koumy (2001) whose study revealed that students whose global and analytic learning styles were mismatched with instructional approaches showed greater achievement in reading comprehension than those students whose learning styles were matched.

The results of the study revealed that there was a statistically significant interaction effect ($\alpha = 0.05$) between the mean scores of the matching strategy on the reading achievement posttest. There was a significant interaction effect of 10.15 among the four groups in favor of the matching strategy. This finding might be attributed to the following reasons. First, it might be due to instructional strategy which was interactive and designed to accommodate students' learning needs and styles through a variety of instructional activities that accommodated their learning style. Secondly, it might be the Instructor's ability to provide a learning environment that was interactive and participative. The instructor viewed himself as a partner along with his students in the classroom. This result was in line with the findings of Hayes and Allinson (1993) that performed a review of studies that examined the interactions between individual learning styles and instructional strategies. Ten of 17 studies support the hypothesis that the instructional strategies used will influence the achievement of students with different learning styles. Swailes and Senior (2001) propose that learning styles research would benefit from development of a better, unified theory, and that more research is needed on the differences between preference, styles, and strategies.

10. Recommendations

Further research is recommended to provide additional knowledge regarding the cognitive learning style-based instruction, and to the replication of the experiment at other different levels of learners. Social and socioeconomic levels and gender may be studied to determine if these variables significantly affect style match and students' achievement. It is suggested that future studies may involve matching instructional strategy with cognitive learning style in an experimental treatment only; the control treatment should use mismatching in order to provide more contrast in comparing the results.

11. Implications

By implication, reading instructors may employ appropriate learning styles inventory at the beginning of the semester and or course in order that they would be able to design their instruction in conformity with students'

learning styles. By doing this, they can assist their students to become more effective readers.

Also, teachers of English reading are invited to balance analytic style activities with global style activities emphasizing formal learning (analytic) with more open-ended unstructured activities that emphasize conversation and cultural contexts of English language (global).

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Annex A

Table 1. Results of Two Way ANOVA for both groups on the achievement pretest

Source		Sum of Squares	Degrees of freedom	Mean Square	F	Significance
Pretest Achievement	Between groups	4.624	1	1.541	1.430	0.24
	Within groups	101.336	94	1.078		
	Total	105.959	95			

Annex B

Table 2. Means and standard deviations for students' scores on the reading achievement posttest due to the learning style and the instructional strategy

Style	Strategy	Mean	Std. Deviation	N
analytic	analytic	8.39	0.88	31
	global	7.79	1.26	28
	Total	8.10	1.11	59
global	global	8.30	0.92	20
	analytic	7.53	0.94	17
	Total	7.95	0.10	37
Total	analytic	8.08	0.97	48
	global	8.00	1.15	48
	Total	8.04	1.07	96

Annex C

Table 3. F-ratio of the two-way ANOVA analysis for interaction between instructional strategy and learning style on the reading achievement

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
STYLE	0.68	1	0.67	0.636	0.427
STRAT	0.16	1	0.16	0.154	0.695
STYLE * STRAT	10.65	1	10.65	10.150	0.002
Error	96.50	94	1.05		
Corrected Total	107.83	95			

Annex D

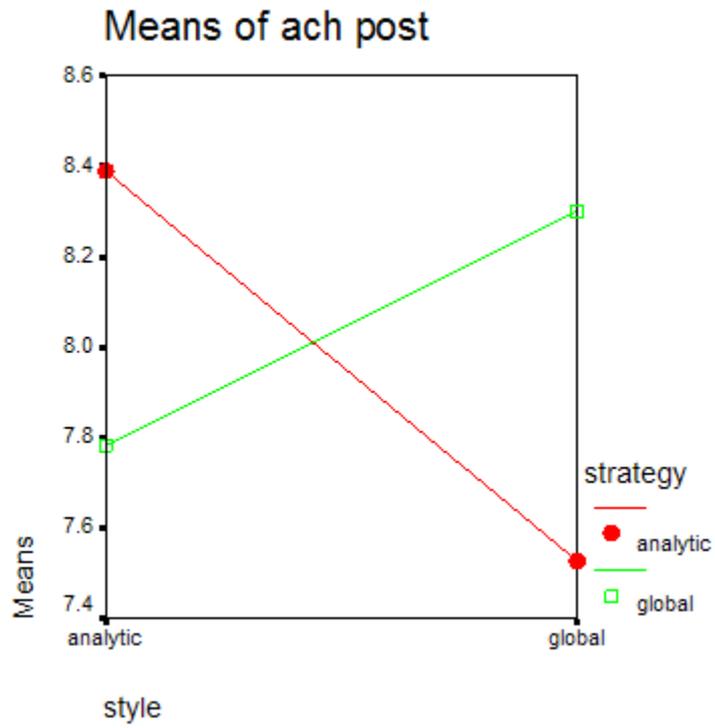


Figure1. Interaction between instructional strategy and learning style on the reading achievement