The Effect of Computer Assisted Language Learning in Teaching English Grammar on the Achievement of Secondary Students in Jordan

Abdallah Abu Naba'h[1], Jebreen Hussain[1], Aieman Al-Omari[2], and Sadeq Shdeifat[1]
[1]Department of Curricula and Instruction, The Hashemite University, Jordan
[2]Department of Educational Foundations and Administration, The Hashemite University, Jordan

Abstract: *This study aimed at investigating the effect of using an instructional software program of English language on the achievement of secondary students in Jordan. The sample of the study consisted of (212) students distributed randomly on four experimental groups and four control groups. The instruments of the study were an instructional software program for teaching the passive voice and an achievement test. An Analysis of covariance was used to find out the effect of the instructional program on the students' achievement in the passive voice. The findings of the study revealed that: 1. there were statistically significant differences ($\alpha < 0.05$) between the students' achievement mean scores in grammar attributed to the instructional method of teaching. This difference is in favor of the students in the experimental group 2. there were statistically significant differences ($\alpha < 0.05$) between the students' achievement mean scores in grammar attributed to gender. This difference is in favor of male students. 3. there were statistically significant differences ($\alpha < 0.05$) between the students' achievement mean scores in grammar attributed to stream of study. This difference is in favor of the scientific stream students. In light of the findings of the study, it was recommended that TEFL teachers use CAI lessons in their instruction.*

Keywords: *Computer assisted language learning, achievement, use of instructional program.*

Received November 21, 2007; accepted May 25, 2008

1. Introduction

Jordan has realized the fundamental role of information and communication technology in the global econo0my where knowledge is becoming the primary engine of growth and development [25]. They are so widespread that one feels outdating if not using them [20]. The influence of these over powerful technological tools has pervaded all aspects of the educational, business, and economic sectors of our world [28]. There is no doubt that just as the computer has established itself firmly in the world of business and communication technology, it has also succeeded in acquiring a fundamental role in the educational process. This role is becoming more powerful as computers become cheaper, smaller in size, more adaptable and easier to handle. Computers are becoming more appealing to teachers because of their huge capabilities and extensive effectiveness [10].

The idea of using computers for teaching purposes in subjects like modern languages arouses mixed feelings and meets with a variety of reactions [17]. The fact that computers are used in the teaching of other subjects and are put to a great many applications in society makes one suspect that no field lies completely outside their scope and that they might indeed be of some use [8]. To many, the prospect of using computers is not without appeal; it is the kind of challenge which one feels drawn to respond to. At the same time the technology frightens us; we are afraid that it may come to dominate us, we have qualms about dehumanization in a subject which is concerned above all with human communication, and we may even be afraid of losing our jobs. It is also known that language teaching does not escape the waves of fashion; we remember the errors of the past, the theories and inventions which failed to come up to expectations [16]. Is the use of computers in language teaching, as some critics say, "the language laboratory all over again"? [18].

Such anxieties can be dispelled only by a proper acquaintance with the facts. To begin with, a computer is nothing more than a tool, an aid to be used or not, as the teacher thinks fit [11]. The computer, like any other electrical or mechanical gadget, provides a means of amplifying, or extending the effectiveness of, our natural talents and capabilities. And like other such machines, without the human input and control they are useless. Used properly, however, they can be very effective indeed, enabling the individual to carry out tasks inconceivable by other means [16]. Finally, computers are technologically different from language laboratories [4]. Not only do they involve primarily the written language, they are much more versatile; their

impact on language teaching and language learning is therefore likely to be very different [9]. There is no reason to believe that history will necessarily repeat itself; everyone is aware of the mistakes which were made, and those engaged in computer assisted language teaching are the first to stress that computers are not a universal panacea [18].

Few teachers nowadays, at least in the Western world, rely solely on chalk and blackboard [17]. Over the years, more and more technical inventions have taken their place among the educational aids with which teachers surround themselves, so as to make their teaching more effective. What distinguishes the computers from other pieces of equipment, such as tape recorders and film projectors, and what forms in fact the basis of its being an educational aid is its interactive capability:

"The unique property of the computer as a medium for education is its ability to interact with the student. Books and tape recordings can tell a student what the rules are and what the right solutions are, but they cannot analyze the specific mistake the student has made and react in a manner which leads him not only to correct his mistake, but also to understand the principles behind the correct solution" [22].

The computer gives individual attention to the learner at the console and replies to him. Traditionally, it acts as a tutor assessing the learner's reply, recording it, pointing out mistakes and giving explanations. It guides the learner towards the correct answer, and generally adapts the material to his or her performance [9]. This flexibility, which can include allowing the learner to choose between several modes of presentation, is something impossible to achieve with written handouts and worksheets; it would require huge "scrambled books" with pages and pages of mostly unnecessary explanations, together with an extremely complicated system of cross-references. Nor would the learner get the instant feedback so beneficial to the learning process which the computer provides. The computer thus promotes the acquisition of knowledge, develops the learner's critical faculties, demands active participation and encourages vigilance [14]. Gonglewiski [12] maintained that computer-mediated instruction can provide a very valuable language learning experience.

Computer Assisted Language Learning (CALL) is the acronym for computer assisted language learning and it is related to the use of computers for language teaching and learning. Significant use of CALL began in the 1960s. Since then, the development of CALL software has followed the changes in teaching methodologies [14]. As teaching methods changed to audio - lingual and communicative approaches, CALL software included simulations and more interactive programs. Research has shown that learning strategies employed in CALL can affect the quality of learning the language. However, it still lacks methods and a clear theoretical foundation [7].

2. Statement of the Problem

In the light of the information revolution and the scientific challenges of the 21st century, there is a sweeping trend to use computers in al aspects of life and education is no exception. On the other hand, the world is heading towards knowledge economy and a lot of money will be invested in computer assisted language learning instructional software programs. Therefore, it is worth investigating the effectiveness of such CALL programs on the performance of learners.

2.1. Aims of the Study

The general aims of this study are the following:

- Developing an instructional program for teaching a grammatical item of English language which is the passive voice, and
- Investigating its effect on developing students' achievement in English grammar.

All in all, the study attempts to answer the following questions:

- Are there any statistically significant differences ($\alpha < 0.05$) between the students' achievement mean scores in grammar attributed to the instructional method of teaching (traditional& computerized)?
- Are statistically significant differences ($\alpha < 0.05$) between the students' achievement mean scores in grammar attributed to the stream of study (scientific & literary)?
- Are there any there any statistically significant differences ($\alpha < 0.05$) between the students' achievement mean scores in grammar attributed to gender (male & female)?

2.2. The Importance of Study

The domain of CALL in Jordan is in need of more research. To the researchers' best knowledge, studies about computer-based instruction in Jordan are not so many. A few studies about the use of CALL in teaching grammar to Jordanian EFL learners have been conducted. It is anticipated that this study will shed light on the benefits of using computers in language learning in general, and in learning English grammar in particular. This study also attempts to bridge the gap between the theoretical and practical sides of using CALL in teaching grammar.

Thereupon, the findings of this study may be functional for different categories of people; it may help EFL curricula designers and EFL methodologists develop teaching materials which suit various ways of teaching and match students' level of achievement in English language in general and in grammatical

structures in particular. Moreover, this study may help teachers by facilitating their role as well as students by helping them absorb the structures and rules of English quite easily and smoothly. Finally, this study may encourage other researchers to conduct further studies on the same topic, which will enrich both the local and international literature.

3. Limitations of the Study

This study has the following primary limitations:

- This study is confined to the first secondary students in the academic year 2005/2006. In Al-Zarqa Directorate of Education.
- The results of this study may be confined to the first secondary stage students only.
- The study is restricted to one aspect of language which is the passive voice.

4. Review of Related Literature

Many researchers are interested in using computers as a medium for teaching / learning. Therefore, many studies were conducted on using CALL for teaching English. To the researchers' best knowledge, a few studies were conducted on using CALL in teaching English grammar in Jordan. However, this section contains studies conducted on teaching other components of the language via computer. Pattern and Cadienno [24] compared the relative effectiveness of traditional instruction and processing instruction, both for interpreting and producing Spanish object pronouns in OVS and OV order .The traditional instruction involved grammatical explanation and output practice, while the processing instruction involved grammatical explanation and comprehension practice. The processing group performed significantly better than the traditional group.

[7] Investigated the achievement of fifth grade students who used computer in different subjects with their colleagues who only followed traditional methods. The students were distributed into three groups; group 1 use computers for 60 minutes every week, group 2 use the computer in less duration and fewer tasks, and group 3, the control group, use traditional instructions. The results show significant differences in the achievement of students in favor of the groups who use computers.

[19] Investigated the use of computer-based L2 grammar instruction. The results of these studies seem to indicate that computer-based grammar instruction can be as effective as or more effective than traditional instruction (e.g., workbooks and lectures).

[21] Conducted a study concerning the relative effectiveness of computer-assisted production (output) practice and comprehension (input) practice in second language acquisition. The results of the study indicate that the output-focused group developed more grammatical skills than the input-focused group, suggesting that the production practice required more syntactic processing on the part of the learner than the comprehension practice. [26] Replicated Van Pattern and Cadierno's study. He found no significant difference between the input processing group and the output-processing group. [3] Investigated the effect of using computers in the teaching of L2 composition on the writing performance of learners. The findings revealed that there are considerable differences for using computers as an effective writing tool. [23] Conducted a study comparing the computer-based grammar instruction and the teacher-directed grammar instruction .The results showed that for all levels of English proficiency, the computer - based students scored significantly higher on open-ended tests covering the structures in question rather than the teacher-directed instruction. The results indicate that computer-based instruction can be an effective method of teaching L2 grammar. [1] Conducted a study to explore the effect of a CALL program on students' writing ability in English by teaching the program cooperatively and collectively. The findings of the study revealed that there were statistically significant differences between the experimental group, who studied via computer, and the control group, who studied in the traditional method. The difference was in favor of the experimental group who studied via computer.

Al-Qumoul [2] conducted a study to investigate the effect of an instructional software program of English language functions on tenth graders' achievement. . The results reveal that the students who studied the English language functions through CAI lessons performed better than those who learnt by the traditional method. [27] Examined the overall effect of using e-mails on the writing performance of Taiwanese students in English. The major findings demonstrated that students made improvements on syntactic complexity and grammatical accuracy. The results also revealed that the e-mail writing was a positive strategy that helped improve their foreign language learning and attitudes towards English.

In conclusion, having reviewed the above studies, we find that many researchers assert the importance of computer-assisted language learning. It is clear from the studies that using CALL is more beneficial and helpful than using the traditional methods, e.g., [17], Pattern and Cadienno, [24], [7], [21], [3], [23], [1], [2]. However, only few of them report that there are no significant differences between the CAI lessons and the traditional methods of instruction, e.g., [19].

This study is different from the previously mentioned studies. It deals with a component, which was neglected by many researchers, English grammar. To the researchers' best knowledge; a few studies were conducted on teaching grammar through computer in

Jordan. For this purpose, the researchers developed an instructional program for teaching the passive voice.

5. Methodology and Procedures

5.1. Sample of the Study

Four public schools were purposefully chosen from the Educational Directorate in Zarqa for convenience. In addition, the schools were equipped with computer labs .Consequently, students are supposed to have previous experience in using software.

The sample of the study consists of (212) first secondary students assigned randomly to eight sections. Four sections were randomly assigned to the experimental group (scientific, literary males and scientific, literary females); each section consists of (20) students selected and assigned randomly, and four assigned to the control group (scientific males (20 students), literary males (27 students), scientific females (45 students) and literary females (40 students)). The experimental groups were taught the passive voice via computer while the control groups were taught the same grammatical item by the traditional method. The sample students were chosen from Al-Zarqa Directorate of Education.

5.2. Research Instruments

To implement this study successfully, the researchers have developed two types of instruments: an achievement test, and a software program.

5.2.1. The Achievement Test

The test was designed by the researchers. It was used as both a pre-test and a post-test to find out the impact of the software program on students' achievement.

The test comprises (30) multiple-choice items of four alternatives. At the beginning of the test paper, the instructions of the test were introduced. The subjects were asked to choose the correct answer. The time allocated for the test was (50) minutes. Concerning the marking scheme, there is one mark for each item, so the total score is out of (30).

The students' previous knowledge was assessed by the pre-test administered to both groups (control and experimental) before the study started. The objective of the pre-test was to assess the students' background knowledge of the passive voice.

The same pre-test was used at the end of the study as a post-test to assess the students' achievement on the topic, the passive voice. The objective of the post-test was to assess the effect of both instructional methods (contemporary and computerized) on students' achievement.

5.3. Test Validity

The test content was validated by a team of English language specialists. The team was asked to validate the content of the test with regard to test instructions, the relevance of questions to content, its suitability to the research goals and objectives, the number and arrangement of questions, and the suitability of the time allocated to the test. The remarks of the validating team, their notes and suggestions were taken into consideration, and the researchers made the necessary modifications before applying the test.

5.4. Test Reliability

The test reliability was obtained through a test-retest method, which was applied on a pilot group of (25) students who were randomly chosen from the population of the study and excluded from the sample. The test was repeated on the same group to check its reliability two weeks later. The reliability correlation coefficient of the test-retest was calculated using Pearson correlation formula. It was found to be (0.81), which is considered to be suitable from a statistical point of view for the purpose of this study.

5.5. The Software Program

For the purpose of this study, the researchers developed an instructional program to teach the passive voice and find out its effect on the achievement of students in the first secondary stage. The program was based on Macro- Media Flash Professional Version 6. The program is organized in the following way:

- Introduction
- Construction
- Use
- Agent
- Present Verbs in the Passive
- Past Verbs in the Passive
- Modal Auxiliaries in the Passive
- Problematic Issues Regarding the Passive Voice
- Explanation and Examples
- Exercises
- Drills and Practice
- Test yourself

The program also provides model answers for the items presented in the exercises. Moreover, the student receives feedback for his achievement simply because the program contains a system for correction. The student can easily get his/her scores when he/she finishes any exercise.

5.5.1. The Design of the Software Program

When developing the software instructional program, the researchers took into consideration the following:

- Windows/buttons/colors/font type.
- The interface to be user-friendly.
- The sequence of the screen to be logic.
- Allow users browse without getting lost and users always know where they are.
- The program easy use.
- The use of the items to be correct.

5.5.2. Validity of the Software Program

The content of the program was validated by TEFL and curricula designing specialists. The validating committee consisted of two PhD holders in curricula and instruction, one of them is specialized in educational technology, four highly qualified teachers of English, and four supervisors in the Ministry of Education in Jordan.

5.5.3. Findings Related to the First Question

The first question asks about the existence of statistically significant differences ($\alpha < 0.05$) between the students' achievement mean scores in grammar attributed to the instructional method of teaching (contemporary & computerized). Analysis of COVAriance (ANCOVA) was performed to test the significance of the differences between the experimental groups who were taught the passive voice via computer and the control groups who studied the same grammatical item using the contemporary method. Table 1 presents the means and standard deviations of the experimental and control groups for students' achievement in the post-test.

Table 1. Means and standard deviations in the post-test according to the method applied.

Method	Means	Std. Deviations	Number
Computerized	26.21	2.26	80
Contemporary	23.95	2.06	80
Difference	2.26	0.2	-

As indicated in Table 1, there are statistically significant differences between the mean scores in the achievement test of both the experimental group who used the computer and the control group who were taught by the contemporary method. The mean scores of the experimental group is (26.21) while it is (23.95) for the control group. The difference between the two groups' mean scores is (2.26).

To find out the statistical significance of this difference, the researchers employed the 3-Way ANCOVA to the results of the post-test according to the variables of the study (method, gender, stream of study) The variance among the dependent variable groups (achievement in the post- test) is the same, since the calculated significance level (0.122) was greater than the postulated significance level ($\alpha < 0.05$). The results of the analysis of covariance are as shown in Table 2.

Table 2. 3-Way analysis of covariance (ANCOVA) for students' achievement in the post-test.

Source of Variance	Sum of Squares	Df	Mean Squares	F	Sig.
Method	148.737	1	148.737	75.47*	0.00
Gender	30.196	1	30.196	15.353*	0.00
Stream	31.405	1	31.405	15.968*	0.00
Pretest	314.972	1	314.972	160.149*	0.00

Table 2 shows that there are statistically significant differences ($\alpha < 0.05$) between the mean scores of the students who were taught the passive voice via computer (the experimental group) and those who were taught the same grammatical item using the traditional method (the control group).

The computed (F) value was (75.47) which is statistically significant at ($\alpha < 0.05$). This shows that there is a significant effect of the use of a computerized software program on the achievement of students. This effect is in favor of the experimental group who were taught via computer.

5.5.4. Findings Related to the Second Question

The second question asks about the existence of statistically significant differences ($\alpha< 0.05$) between the students' achievement mean scores in grammar attributed to gender (male & female). To test this question, the researchers calculated the students' mean scores and standard deviations in the post-test for both groups of study (male and female students). The findings are as shown in Table 3.

Table 3. Means and standard deviations in the post-test for male and female students.

Gender	Means	Std. Deviations	Number
Male	25.7	2.39	80
Female	24.46	2.34	80
Difference	1.24	0.05	-

Table 3 indicates that there is a difference between the mean scores of both male groups and female groups in the post-test. This difference was (1.24) in favor of the males. The mean scores of the males was (25.7) while it was (24.46) for the females. To reveal the statistical significance of these differences, the researchers employed the 3-Way ANCOVA to the results of the post-test according the variables of the study (method, gender, and stream).

Table 2 shows that there are statistically significant differences ($\alpha < 0.05$) between the mean scores of both

male and female students. The calculated (F) value was (15.353) which is statistically significant at ($\alpha < 0.05$).

This proves that there is an effect on students' achievement attributed to gender. This effect is in favor of male students.

5.5.5. Findings Related to the Third Question

The third question asks about the existence of statistically significant differences ($\alpha < 0.05$) between the students' achievement mean scores in grammar attributed to the stream of study (scientific & literary). To test this question, the researchers calculated the students' mean scores and standard deviations in the post-test for both groups of the study (scientific, and literary). The results are as shown in Table 4.

Table 4. Means and standard deviations in the post-test for scientific and literary students.

Stream	Means	Std. Deviations	Number
Scientific	25.56	2.54	80
Literary	24.6	2.24	80
Difference	0.96	0.3	-

Table 4 shows that there is a significant difference between the mean scores of both scientific group and literary group in the post-test. This difference was (0.96) in favor of the scientific stream students. The mean scores of the scientific students was (25.56) while it was (24.6) for the literary stream students. To find out the statistical significance of these differences, the researchers employed the 3-Way Analysis of Covariance to the results of the post-test in terms of the variables of the study (method, gender, and stream of study).

Table 2 shows that there are statistically significant differences ($\alpha < 0.05$) between the mean scores of both scientific students and literary students in the post-test. The calculated (F) value was (15.968) which is a statistically significant value at the significance level ($\alpha < 0.05$). This indicates that there is an effect on students' achievement attributed to the stream of study (scientific, literary). This effect is in favor of the scientific stream students.

6. Discussion and Recommendations

6.1. Discussion of the Findings Related to the First Question

ANCOVA results showed that there are statistically significant differences in the achievement mean scores of the subjects of the experimental group who studied the passive voice via computer and the control group who studied the same grammatical item using the contemporary method. This difference was in favor of the experimental group. A quick look at the students' scores on the pre-test, shows that there were no statistically significant differences between the mean scores of the experimental group and the control group. The scores were (22.09) and (21.66) respectively.

This result indicates that the subjects had the same background concerning their knowledge of the passive voice before implementing the experiment. This also indicates that both groups were equivalent in this regard. The figures also postulate that any gain in the academic achievement in the field of the passive voice could be attributed to the method employed.

The total mean scores of the experimental groups in the post-test was (26.21), while it was (23.95) for the control groups, This means that the achievement in the post-test for both the experimental and control groups is attributed to the treatment. It can be easily noticed that the extra gain in the experimental group's mean scores is higher than the extra gain in the control group's mean scores. This improvement is attributed to the method employed This means that the use of the software program has noticeably enhanced the abilities of the students of the experimental group regarding the passive voice.

One possible explanation for the effect of using computers for teaching English grammar is that computers enable each individual to work according to his own pace. The user may move freely from one component to another as he wishes and according to his needs. This characteristic makes CALL programs cater for individual differences.

Another possible explanation for the considerable differences in the above findings is that CALL method makes it possible for the learner to use the program whenever he wants at any place.

The computer method, unlike the contemporary method, enables the learner to get feedback easily, which develops self-reliance skills. Using the computer gives the student the chance to use many senses during the learning process. The use of the computer screen which is accompanied by animation, pictures, colors, music and sounds attracts students' attention and empowers faculties of retention to them. The researchers believe that students can learn more efficiently and effectively on their own with additional resources which technology makes available. Using software programs applies "Learning by Doing" method, since learners use the keyboard and the mouse to click or to print their answers. Computer instructional programs are interactive. Learners can easily go forward or backward according to their needs and requirements.

When comparing the results of this study with the results of the previous related literature, we find that this study is consistent with many practical studies which were conducted before. It is consistent with [23] who proved experimentally that computer-based instruction can be an effective method of teaching the

grammar of a second language. It is also consistent with McEnry, Baker& Wilson [19], [1], [21], and Pattern and Cadienno[24] who say that the processing group performed significantly better than the traditional group. The study is also consistent with [2], [17], [5], and [7] who emphasize that the computerized method is more beneficial for students than the traditional method. However, the results of the present study in this regard are different from the results reported by [26] who found no significant differences between the computerized group and the traditional one. Also, this study is inconsistent with McEnry, Baker & Wilson [19] who found that the computer-based grammar instruction could be as effective as or more effective than traditional instruction. Perhaps the difference in these results is due to the differences in culture.

6.2. Discussion of the Findings Related to the Second Question

The findings of the ANCOVA for the scores of the subjects in the achievement test revealed that there are statistically significant differences attributed to the gender variable in favor of the males over the females. The mean scores of the female students in the post-test was (24.46) while it was (25.7) for the males in the same test. This means that male students have higher scores than female students in the post-test regardless of the way of teaching used.

Possible explanation for this finding is the fact that male students are more serious in their learning process. They do their best to seize every possible opportunity to increase their knowledge.

Another explanation for this finding is that male students are incredibly interested in computers and multi-media programs. They got bored of the traditional method that is why they showed a high level of interest and curiosity when they were being taught via computer. [29] is in line with the above view. He found no statistically significant differences between students' mean scores attributed to gender in their comparative studies. However, the above view is inconsistent with [2], [1], [21] and [24] who believe that female students were superior to male students in their academic achievement.

6.3. Discussion of the Findings Related to the Third Question

The findings of the ANCOVA for the scores of the subjects in the achievement post-test revealed that there are statistically significant differences attributed to the stream of study variable. This difference was in favor of scientific students over literary students.

A look at the findings of the analysis of covariance for the students' scores in the post-test proves this viewpoint. The mean scores of the scientific students in the post-test were (25.56) while the mean scores of the literary students in the post-test were (24.6). This means that scientific students have higher marks than literary students regardless of the gender or method of teaching.

One possible explanation for the above point of view is that the scientific stream students, generally speaking, have relatively higher mental abilities than literary stream students, this is shown by the fact that they were accepted in the scientific stream which demands higher grades. Another possible explanation is that the scientific stream students are much more interested in studying and learning in general and better in learning languages in particular. The finding of this study in this regard is consistent with [3] who statistically proved that scientific stream students were superior to literary stream students in their academic achievement.

7. Recommendations

Based on the findings discussed above, the researchers suggest the following recommendations:

- Researchers should conduct other studies on the effect of computerized programs on the students' achievement in English language grammar, focusing on other grammatical items in other regions in Jordan in order to generate a more comprehensive idea about the effect of CAI method on teaching English grammar in Jordan.
- The use of software programs in language teaching should be investigated further. Researchers should conduct further studies on the effectiveness of CAI method on teaching language skills and other components of the language.
- Teachers are advised to vary their methods, techniques and ways of teaching, according to their students' needs and interests. They are also advised to use the computerized method more intensively and more frequently.

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Abdallah Abu Naba'h is assistant professor at the Department of Curricula & Instruction. Graduated from the University of Baghdad in 1972, obtained his MA in English from North Texas State University in USA, and got his PhD from the University of Wales in (TEFL) in 1988. Taught English for different levels in different Arab countries.

Jebreen Hussain is associate professor at the Department of Curricula & Instruction, Faculty of Educational Sciences at the Hashemite University in Jordan. His research interests include educational technology and its applications in teaching and learning.

Aieman Al-Omari is assistant professor and chairperson of the Department of Educational Foundations and Administration, the Hashemite University, Jordan. He earned his PhD from Washington State University, USA, in 2005. His research interests include higher education administration, student's affairs administration, educational leadership, and strategic planning.

Sadeq Shdeifat ia assistant professor at the Department of Curricula & Instruction, dean's assistant for practice teaching at the Hashemite University, Jordan. He obtained his PhD from the University of Huddersfield, UK in 2005. His research interests include Islamic education, teachers' training, and curriculum design.