

The effect of the Appleton model on the acquisition of syntactic concepts among students of the College of Administration and Economy, Department of Industrial Management

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ABSTRACT

The teaching Arabic language is marred by many deficiencies because teachers are focusing on a purely theoretical method. Therefore, there is an urgent need to employ modern teaching methods. Accordingly, this investigation aimed at identifying the effect of the Appleton model on students' acquisition of Arabic syntactic concepts. The research specimen consisted of the first-stage students in the Department of Industrial Management, College of Administration and Economy, Baghdad University for the academic year 2019-2020, the first semester. It was concluded that the Appleton model had an effect on the acquisition of Arabic syntactic concepts compared to the conventional method. Based on the research findings, the researchers suggested some recommendations.

Article Received: 10 August 2020, Revised: 25 October 2020, Accepted: 18 November 2020

- What is the effect of the Appleton model on students' acquisition of syntactic concepts at College of Administration and Economy, Department of Industrial Management?

Research Objective

This investigation aimed at identifying the effect of the Appleton model on students' acquisition of syntactic concepts at College of Administration and Economy, Department of Industrial Management.

Research Hypotheses

For achieving research objective, three hypotheses were developed as follows:

1. There is a statistically significant variance between the average scores of the experimental grouping students who were taught utilizing the Appleton method and those of the control grouping who were taught utilizing the conventional method in the post-test at the significance level (0.05).
2. There is a statistically significant variance at the significance level (0.05) in the average variances between the scores of the pre- and post-tests of the acquisition of syntactic concepts among the students of the experimental grouping who were taught utilizing the Appleton method.
3. There is no statistically significant variance at the significance level (0.05) in the average of variances between the scores of the pre- and post-tests of the acquisition of syntactic concepts among

1. Introduction

Research Problem

The teaching and learning process of Arabic language entails various difficulties. Its teaching is marred by many deficiencies because universities and schools have focused on a purely theoretical method, impeding its development. The low levels of students in the Arabic language demonstrates the effects of those difficulties. This is attributed to several reasons including its syntactic structure and the various and complex topics with several units and details that require further explanation and analysis. In addition, the Arabic language textbook may be a brief book that is not commensurate with the level of mental capacity of the students as well as the absence of exercises that develop their skill of expression (Al-Khalidi, 1993). Consequently, there is an urgent need to employ modern teaching methods and models. The conventional methods are no longer sufficient to achieve the scientific objectives of teaching the Arabic language, as emphasized by the curriculum in Iraq, represented by the acquisition of basic syntactic concepts and the improvement of their tendencies. Hence, the problem of research lies in finding a teaching model suitable for the educational environment in Iraq and achieve effective learning that makes students participating in the educational process and improves their achievement, as well as increasing their desire to acquire syntactic concepts. Based on the above, the problem of research is formed in the following question:

1. The importance of Arabic language as an essential material in educating the individual and making him a good citizen.
2. The importance of the Appleton model and its steps that make the learner the focus of the educational process, motivate learners to think and learn to think and employ effective educational activities, and keep them away from the conventional method that focuses on memorization.
3. The importance of concepts as the basic elements of every subject.
4. The university stage is an important stage for the formation of the individual's personality who understands his role in society, his rights and duties. Thus, s/he should be properly directed at this stage as it is the stage of preparing the learner.

Research Scope

The current research was confined to teaching the Arabic language for the first-stage students in Department of Industrial Management, College of Administration and Economy, University of Baghdad, of the academic year 2019-2020, First Semester.

Definition of Terms

The Appleton Model

- a. It refers to a model with four characteristics reflecting the main features of any constructive model, namely, existing ideas, processing information, seeking information and the social context (al-Muhaysin, 2007).
- b. It is a model that is based on the sources of constructive theory, particularly Piaget's vision of accommodation and imbalance, and the opinions of Klaxton and Howard on the adaptation between past and subsequent experiences within the individual's cognitive system in particular the school experiences that are based on Vygotsky's social theory, making the model effective in the constructive teaching (Attia, 2015).
- c. Al-Muhaysin's (2007) conceptual definition is adopted in this investigation. As for the operational definition, it is the model used in all of its stages in order for the students to acquire syntactic concepts.

Acquisition of the Concept

- a. It is defined as a visualization of situations, values, attitudes or behaviors associated with the Arabic language and expressed by word, term or phrase (As-Suwaidi, 1992). As for al-Matroudi (2009), it refers to a term or phrase that expresses a

the students of the control grouping who were taught utilizing the conventional method.

Research Significance

Language is one of the most prominent human phenomena and characteristics. It creates thought and culture in man and helps in the expression of inner feelings. Language, human and civilization are elements interacting with every other since the emergence of man on earth. The more the individual's competence of language skills, the more his interaction with all elements of society with awareness and high skill. Therefore, any society concerned with all methods of language improvement leads its members towards developing levels of creativity and innovation and achieving success in all areas of sophistication and prosperity (an-Naqah, 1995). The Arabic language is the sacred link that binds the people of the Arab nation. It is the language of religion and faith, and hence it has been able to accommodate all civilizations, as well as the Arabic statement is the linguistic manifestation of the divine miracle embodied in the Holy Qur'an (az-Zubay, 2009).

Modern teaching strategies are important in mastering the scientific material or the cognitive structure of the curriculum content and achieving its objectives properly, actively integrating into the learning process, as well as developing multiple affective aspects like curiosity, the positive attitude towards learning and the skills of both teachers and students. This in turn allows every learner to practice and master these skills individually (Shaheen, 2010). Appleton is an educational theorist at the Faculty of Education, Central Queensland University, Australia. Through his model, Appleton has tried to highlight and identify the overlapping factors and find the cognitive scaffolding between theory and practice, especially between students and teachers and among the students themselves. This would make this model effective in constructive teaching (Al-Assadi & Al-Massoudi, 2015). Scaffolding refers to temporal support for learners to enable them to rely on self-learning. It consists of activities, cues and information provided by the teacher to help and encourage students to reach the desired solution that they are looking for or intended to reach (Nwosu & Azih, 2011). As Bruner and Vygotsky call it, scaffolding is a process helping the learner to solve a particular problem that is beyond his cognitive abilities, supported by a teacher or a more advanced experienced peers (Zambrano & Noriega, 2011).

Accordingly, the importance of the current research is illustrated as follows:

learner to seek information to find a solution, which stimulates the memory (Attia, 2015).

c. Seeking Information

At this stage, learners who could not provide complete answers about the situation need scaffolding, which is represented by cues and small bits of information that helps them to find the complete answers through research and exploration. Thus, the role of the teacher at this stage represents the supporting promoter who stimulates them to seek the answer by providing learners with the keys to the search. This process is done utilizing various methods including the practical presentations offered by the teacher, or the teacher's ideas like educational materials available in the learning environment, and the ideas of other learners and peers. These sources are used based on the social context of teaching and learning viewed by the constructivism (Zayer, 2014).

The Concept: An Introduction

The concepts are the basis of knowledge, which become more important currently due to the explosion of knowledge and the expansion of its branches. Consequently, the teacher becomes focusing on helping students understand and realize the conceptual and logical structure of the material while leaving the details (Mara'i & Muhammad, 2009). In the structure of the cognitive system, the concept follows the facts; therefore, they differ in the following characteristics as indicated by Ibrahim (2009):

- Discrimination and classification: the concept distinguishes and classifies things according to common factors.
- Symbolism: the concept symbolizes a characteristic or a set of abstract characteristics.
- Generalization: the concept is comprehensive as it applies to various situations and attitudes.

Accordingly, the concept is a mere mental conception that is named or symbolized to show specific phenomena or events, sharing one or several attributes (Ibrahim, 2009).

The Acquisition of Concepts

The process of concept acquisition is among the main objectives sought to be achieved by teachers through various educational situations for all stages (Al-Jubouri, 2001). It represents a significant part of the learning process in the classroom. Teachers regularly teach new concepts for students utilizing various methods of presentation. This variation may occur even when presenting two various concepts for one category (Abu Zeina, 2010). There are several factors associated with the teacher's role in the students' acquisition of concept including:

common characteristic(s) involved in various situations, events or syntactic concepts.

- b. The operational definition of the acquisition of syntactic concepts refers to a set of meanings, vocabulary and terms expressed by words, sentences or phrases so that the student can define and apply them in various learning situations.

2. Theoretical Framework and Literature Review

The Appleton Model: An Overview

Ken Appleton has developed this model in 1997. It is based on the constructive theory, particularly Piaget's vision of accommodation and imbalance and the opinions of Klaxton and Howard on the adaptation between past and subsequent experiences within the individual's cognitive system in particular the school experiences in the social context that is emphasized by Vygotsky (Attia, 2015). It is one of the applications of contemporary theories (constructive theory) in learning. This theory is defined as a process of receiving that includes the reconstruction of learners for new meanings within the context of their current knowledge with their previous experiences and learning environment, representing both real-life experiences and previous information, as well as the atmosphere of learning the basic aspects of constructive theory (Zaytoun, 2007).

Stages of the Appleton Model

a. Existing Ideas

This stage represents the starting point in the constructive learning, which considers that new learning is based on previous knowledge through diagnosing and sorting the ideas of learners before starting to display the content (Calik & Pasayas, 2006). At this stage, various methods such as schemata, interviews or exploratory questions are used to sort the learner's ideas. In the light of the learner's answers, experiences are categorized into ideas and cognitive systems that can be recalled when interpreting the events and new experiences presented to them. Then, a comprehensive idea is given on the learner's vision of the world and interpretation of its events and his/her behavior in it (Al-Assadi & Al-Massoudi, 2015).

b. Processing Information

At this stage, the learner attempts to identify the proper explanation for constructing meaning about the new information. There are three possibilities, either: a new form of information is formed that fits perfectly with the existing idea and satisfies the student, an approximate fit, or cognitive conflict (Qarni, 2011). The cognitive conflict and the lack of accommodation between the learner's existing knowledge and new learning lead the

the experimental grouping students who were taught according to the Appleton model achieved higher scores compared to the control grouping students who were taught utilizing the conventional method in relation to the acquisition of syntactic concepts.

Shnawa and Abdul-Ameer (2018) aimed at finding out the effectiveness of the Appleton model in achievement and deductive thinking among students of the second intermediate grade in the subject of history. They employed the experimental design of the partial control with two equal groupings. The research specimen included (50) female students randomly selected and divided into (25) students for every grouping. The two groupings were statistically equal in the variables of (intelligence, age, qualification of parents, previous achievement of history and deductive thinking). As for the research tools, an achievement test was designed consisting of (40) multiple-choice items, a deductive thinking test consisting of (30) items after determining their validity and reliability. The findings of the research showed the superiority of the experimental grouping in achievement and deductive thinking.

3. Research Method

The Experimental Design

The design of the experimental and control groupings was adopted with applying the pre- and post-test, taking into account the research objectives and hypotheses. The presence of the control grouping increases the accuracy of findings. Hence, the time factor and the teaching method may affect the level of accuracy.

Table 1: The research groupings

Experimental grouping	Pre-test	The independent variable (educational program)	Post-test
Control grouping	Pre-test	Did not experience the independent variable	Post-test

distributed to two groupings: experimental with (38) students and the control with (39) students after excluding the students who failed.

The Equivalence of Research Groupings

Before conducting the experiment, the two groupings were equalized statistically in certain variables that could have an effect on the experiment validity. These variables were:

- a. Student's age determined in months

Table 2: Findings of the T-test for the average age between the research groupings

Grouping	Number	Arith. Mean	S.D	T-value		Significance level (0.05)
				Determined	Tabulated	
Experimental	38	243.8684	0.34257	0.854	2.045	No variances
Control	39	243.7949	0.40907			

Standard deviation= S.D, Arithmetic mean= Arith. Mean

1. Identifying the required motivations and report the learner about them.
2. Identifying the preferred answers and report the learner about them.
3. Identifying the appropriate strategies and report the learner about them.
4. Preparing the required information for the concept.
5. Preparing students to recall the correct information.
6. Increasing the motivation level for the learner (Al-Yamani, 2009).

Previous Studies

Al-Lami and Amir (2017) aimed at identifying the impact of the Appleton model on acquiring syntactic concepts for students in the fourth preparatory grade. To achieve this objective, the researchers conducted an experiment that lasted for two months. They randomly selected Al-Fayhaa High School for Boys to conduct the experiment. The research specimen included (68) students, distributed to two groupings, namely, experimental and control with a total of (34) students for each. The two groupings were equal in the variables (age, intelligence quotient, scores of first term exam and qualification of parents). The researchers adopted an experimental design of the partial control in the pretest of the two groupings. The extraneous variable was defined to reduce the impact of experimental procedures and applied experience in the second semester of the academic year (2015-2016). After completing the experiment, its findings were statistically analyzed utilizing a T-test for two independent specimens. The findings showed that

The Research Community and Specimen

The research community represented the students selected from College of Administration and Economy at Baghdad University for the academic year 2019-2020. Concerning the specimen, it was selected from the first stage, Department of Industrial Management during the first semester. The pre-test (acquisition of syntactic concepts) was applied to all students, who were (77) male and female students, and then they were

are found in the average age between the two groupings.

b. Scores of grammar acquisition test

Table 3: Findings of the T-test for the average scores in the pre-test between the research groupings

Grouping	Number	Arith. Mean	S.D	T-value		Significance level (0.05)
				Determined	Tabulated	
Experimental	38	17.8684	0.34257	0.572	2.045	No variances
Control	39	17.8205	0.38878			

researchspecimen. Every correct question got one mark. The findings showed thatthe arithmetic mean of the experimental groupingwas (27.9737), while that of the control groupingwas (27.8974). By employing the T-test for two independent specimens, no statistically significant variancewas found at the significance level (0.05).Hence, the determined T-value (1.356) waslowercomparison with the tabulated value (2.38) withafreedom degree (75). Therefore, the two groupings were equalized in this variable, as clarified in table (4).

Table 4: Findings of the T-test for the average scores of intelligence in the pre-test between the two groupings

Grouping	Number	Arith. Mean	S.D	T-value		Significance level (0.05)
				Determined	Tabulated	
Experimental	38	27.9737	0.16222	1.356	2.045	No variances
Control	39	27.8974	0.30735			

wasdesignedon the basis of educational content and the three levels of concepts (definition, discrimination and generalization).

Formulation of the Tests Items

The objective itemswere adopted for beingcharacterized by validity, reliabilityand comprehensiveness. They were designed based on scientific criteria. They covered theinvestigation material and its objectives.The researchers selected multiple-choice test because it is commonly usedas well as reducingthe guessing factor. This test measures the three levels of acquisition of the concept through (35) items.

Preparation of the Answer Instructions

The answer instructions were formed toreportthe learners how to answer and the time specifiedfor it.The time taken to answer the test items was (39,567) minutes.

Instructions of the Test Correction

A specimen ofanswer to the test items was made. Every correct answergot (1) mark and the incorrect answer got (0). The unanswered items and those with more comparison withone choice were treated

Table (2) demonstrates that the determined T-value (0.854) is lower comparison withthe tabulated value (2.045), showing that no significantvariances

Based on findings clarified in table (3), the determined T-value (0.572) is lower comparison with the tabulated value (2.045). Accordingly, no statistically significant variances are found in the level of syntactic concepts acquisition between the researchgroupings.Thus,the two groupings were equalized in this variable.

c. Intelligence test

Raven intelligence test was employed because it wasapplied tothe Iraqi environment.The test consisted of (60)questions, distributed to the

d. Identifying the scientific material that would be taught for theresearch groupings during the experiment.It included these topics: nominal sentence, incomplete verbs, semi-verb letters, verb phrase and number.

e. Formulation of behavioral goals: (35) behavioral goals were formed on the basis of objectives and content to be taught in the experiment. They weredistributed to the six levels in Bloom's Taxonomy: evaluation, synthesis, analysis, application, comprehension, and knowledge.Forverifyingtheir validity and adequacy to the content, they were presented to a numberof experts in methods of teaching Arabic language and in psychological sciences.Therefore,some objectives were amended based on the percentage of experts' approval, which was (80%).

f. Designing the test of acquiring syntactic concepts: this test was designedto measure the acquisition of syntactic concepts among students anddeterminethe effect of Appleton's strategy on it.Since there is no test related toArabic grammar (syntactic concepts) applicableto this research,a test

intotwogroupings, one for the highest scores and the other for the lowest scores. The percentage of scores in these twogroupings is preferably to be 27% of the total scores, providing the best possible size and differentiation. The coefficient of difficulty was revealed forselectingthe items with the appropriate difficulty and deleting the itemthat are very easy/ difficult. The findings showed that the coefficient of Difficulty ranged between (0.30-0.80), as shown in table (5).

as wrong. The highest score received by students was (35).

Analysis of the Test Items

a. Statistical Analysis of Test Items

The items were analyzed to improve the test quality by identifying and rewriting weak items and excluding the invalid ones utilizing the coefficients of difficulty and discrimination. In order to achieve this purpose, these procedures were followed: correct the answers of students; arrange the scores in descending order; and divide the students

Table 5: The coefficient of Difficulty for the items of the acquisition of concepts test

No.	Coefficient of Difficulty	No.	Coefficient of Difficulty	No.	Coefficient of Difficulty	No.	Coefficient of Difficulty
1	0.37	10	0.33	19	0.34	28	0.30
2	0.33	11	0.31	20	0.34	29	0.43
3	0.36	12	0.32	21	0.34	30	0.43
4	0.38	13	0.38	22	0.80	31	0.49
5	0.39	14	0.33	23	0.39	32	0.45
6	0.37	15	0.49	24	0.57	33	0.38
7	0.37	16	0.48	25	0.39	34	0.41
8	0.35	17	0.47	26	0.31	35	0.30
9	0.32	18	0.37	27	0.64		

who do not have the measured feature or do not know the correct answer for every item of the test. After applying the equation of the coefficient of discrimination, all the values were greater comparison with (0.30), as clarified in table (6).

Bloom indicated that if the difficulty of test items is between (0.20-0.80), the test is good. The coefficient of discrimination of items means the capacity of item to distinguish the individual variances between respondents who have the measured feature or know the answer and those

Table 6: The coefficient of discrimination for the items of the acquisition of concepts test

No.	Coefficient of discrimination	No.	Coefficient of discrimination	No.	Coefficient of discrimination	No.	Coefficient of discrimination
1	0,60	10	0,50	19	0,47	28	0,40
2	0,59	11	0,49	20	0,46	29	0,37
3	0,61	12	0,49	21	0,59	30	0,40
4	0,58	13	0,38	22	0,58	31	0,39
5	0,55	14	0,42	23	0,57	32	0,38
6	0,54	15	0,44	24	0,67	33	0,45
7	0,58	16	0,43	25	0,46	34	0,39
8	0,49	17	0,42	26	0,49	35	0,50
9	0,59	18	0,43	27	0,48		

items were kept because of their discriminative power among students.

Based on findings presented in table (6), all values were more comparison with (0.30) and thus comply with Ebil's standard, who indicated that the item is well discriminated if the power of its discrimination is (0.30) and above. Accordingly, all

b. The Validity of Test

week. The teaching process continued to Monday, 27/1/2020.

- The Appleton strategy was applied to the experimental grouping, and the conventional process was applied to the control grouping.
- The syntactic concept acquisition test was applied to the two groupings simultaneously on Thursday, 30 January 2020.

e. Statistical Tools

- Pearson Correlation Coefficient: to find the test reliability utilizing the retest method.
- The Coefficient of Difficulty: to determine the difficulty of the test items.
- The Coefficient of discrimination: to identify the discriminative power of the test items.
- T-Test for Two Independent Specimens: to determine equivalence between the two groupings in variables in addition to test hypotheses.

4. Findings and Discussion

a. The First Hypothesis

By comparing findings of the post-test, the experimental grouping got an arithmetic mean (32.9474) with a S.D (0.22629), while the control grouping got (18.0513) with a S.D (0.22346). By employing the T-Test for two independent specimens for determining the significant variances between these means, a statistically significant variance was found between the two groupings as shown in table (7).

Table 7: T-test findings for two independent specimens of the concept acquisition post-test

Grouping	Number	Arith. Mean	S.D	Freedom degree	T-value		Significance level
					Determined	Tabulated	
Experimental	38	32.9474	0.22629	75	290.628	2.045	0.05
Control	39	18.0513	0.22346				

To prove this hypothesis, the T-Test was applied to two interrelated specimens to determine if there is an acquisition of syntactic concepts among students of the experimental grouping who were taught utilizing the Appleton model. The arithmetic mean of the post-test was (32.9474) with a S.D of (0.22629) and that of the pre-test was (17.8684) with a S.D of (0.34257), as clarified in table (8).

Face validity represents one of the measures necessary for extracting the coefficient of the test validity. Hence, the test items were presented to a grouping of experts with considering their opinions on the adequacy of items to the feature to be measured. In this research, the test items were presented to (10) experts and specialists to determine their opinions on the validity of the items. The experts agreed on the entire test items by 80-100%.

c. The Reliability of Test

The retest technique is one of the most important methods employed for calculating reliability due to providing information on the findings consistency by having a time interval between the test and retest. It is indicated that time interval between the two tests should not be long so that the students learn new information or forget information they have learnt, nor should be short so that they remember the answers of the first test. Therefore, the duration should range between (10-20) days depending on the student's age and the number of test items. Thus, the researchers retested (35) students within (15) days between the two tests. Utilizing Pearson correlation coefficient, the reliability of test was (0.88), representing a high coefficient of reliability.

d. Application of the Experiment

The experiment was conducted based on the following steps:

- It was applied to the research specimen on Wednesday, 27/11/2019. Every grouping was taught for (2) hours per

Table (7) demonstrates that the determined T-value (290,628) is higher comparison with the tabulated value (2.045) with a freedom degree (75) at a significance level (0.05). This shows that a statistically significant variance is found between the means of the two groupings in favor of the experimental grouping. Therefore, the first hypothesis is accepted.

b. The Second Hypothesis

Table 8: T-test findings for two interrelated specimens of the pre- and post-tests of the acquisition of concepts for the experimental grouping

Test	Number	Arith. Mean	S.D	Freedom degree	T-value		Significance level
					Determined	Tabulated	
Post-test	38	32.9474	0.22629	74	226.304	2.045	0.05
Pre-test	39	17.8684	0.34257				

c. The Third Hypothesis

To prove this hypothesis, the T-Test was applied to two interrelated specimens to determine if there is an acquisition of syntactic concepts among students of the control grouping who were taught utilizing the conventional method. The arithmetic mean of the post-test was (18.0513) with a S.D of (0.22346) and that of the pre-test was (17.8205) with a S.D of (0.38878), as clarified in table (9).

Table (8) indicates that the determined T-value (226.304) is higher comparison with the tabulated value (2.045) with a freedom degree (74) at a significance level (0.05). This means that there is a statistically significant variance in favor of the post-test. Accordingly, the second hypothesis is accepted, indicating that the students of the experimental grouping acquired the syntactic concepts.

Table 9: T-test findings for two interrelated specimens of the pre- and post-tests of the acquisition of concepts for the control grouping

Test	Number	Arith. Mean	S.D	Freedom degree	T-value		Significance level
					Determined	Tabulated	
Post-test	38	18.0513	0.22346	76	1.688	2.045	0.05
Pre-test	39	17.8205	0.38878				

1. The use of the Appleton model in teaching Arabic language due to its significance in the acquisition of syntactic concepts.
2. Call on the continuing education centers in colleges to work on opening training courses for teachers to train them in teaching according to modern teaching models, including the Appleton model.
3. Call on the continuing education centers to develop a teaching manual that explains modern teaching methods, including the Appleton model.

Table (9) demonstrates that the determined T-value (1.688) is lower comparison with the tabulated value (2.045) with a freedom degree (76) at a significance level (0.05). Accordingly, the third hypothesis is accepted that no statistically significant variance is found between the average scores of students of the control grouping in the pre- and post-test. This means that the students of the control grouping did not acquire the syntactic concepts.

Suggestions

In line with the findings of the current research, the authors suggest the next:

1. Conduct a study involving the effect of the Appleton model on other study subjects.
2. Conduct a comparative study between the Appleton model and other modern models to determine their effect on teaching Arabic language.

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Conclusions

In accordance with findings of this investigation, the authors concluded the following:

1. The Appleton model showed a clear positive effect on the acquisition of syntactic concepts for the first-stage students in the Department of Industrial Management.
2. The steps of the model put students in an active and effective position through initiative, asking questions and exchanging ideas.
3. The Appleton model had an effect on the acquisition of syntactic concepts compared to the conventional method.

Recommendations

Depending on findings of this investigation, the authors suggested the following:

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