

## The effect of letter (c) modelling on developing the skills of handwriting performance among learners of Arabic speaking other languages

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### Abstract

This study aimed at identifying the effectiveness of letter (c) modelling in developing the writing skills performance of Arabic learners speaking other languages and the number of views required for the line visual to develop their writing skills performance. The study sample consisted of 15 learners who were studying the Arabic language for the first time and were chosen by the convenience sampling method. The female students did not take a pre-test as they did not know Arabic before. The students were trained on the attached Arabic calligraphy visual, which included all the Arabic language alphabets. The training period lasted for 8 weeks, with two lessons per week, and each session lasted for 40 minutes. The students then underwent a post-test that was checked for validity and reliability. The analysis results showed a clear ability to draw the Arabic letter due to the visualisation of the calligraphy presented by the researcher, which relied on modelling the letter (c) in all Arabic letters. In light of the findings, the study recommended applying the teaching method based on the calligraphy visualisation devised in teaching non-Arabic speakers.

**Keywords:** Handwritten performance, development, letter (c) modelling, learners of Arabic speaking other languages.

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## Introduction

With the rapid development of our recent times, developing new methods to reach better objectives of teaching Arabic has become a necessity. Old methods of teaching handwriting are no longer effective, especially when drawing the letters on lines on paper, where such methods do not show the convenient way of presenting letters. This occurs especially at the beginning of the different years of schooling. Another issue is the learners' reliance on the ready-made computer writing, which has forced the learners to not pay attention to the letters above or below the line. However, a teacher of the Arabic language must move his/her students forward, as well as teach, train and prepare them to be more proficient in Arabic.

Khalifa (2004) stated, 'Learning handwriting instils in students important moral and educational qualities, as it teaches them to pay attention and accuracy of observation through a comparison between what they write and the original they present, as well as give them patience, perseverance and control over hand movements and control in writing'.

Writing helps a person to express feelings and emotions. Handwriting is one way to fulfil this need. Cursive writing is not considered creative writing because it is based on looking at a previous model and trying to imitate it within a specific reality where the imitator does not have to go beyond, even if the imitator is required to feel it, understand its parts and details, and feel the style of its structure and composition.

### 1.1. Conceptual Framework

Arabic calligraphy has entailed several challenges throughout the history of its teaching. One of the most prominent of these problems is the way to present the Arabic letter to learners. Some present the letters in groups depending on the similarity between them in the drawing. Others present it depending on the similarity in pronunciation and so on. A plethora of researches (e.g., Abdullah & Al-Hassan, 2015; Attar, 2009; Helles, 2004; Al-Sheikh, 2003) has also proven the existence of deficiencies in the handwriting of learners in different academic years.

Among the difficulties related to drawing Arabic letters for non-native speakers are the different Arabic fonts, the large number of letter shapes, the lack of methodology of calligraphers and Arabic teachers in drawing letters, the lack of preparation before writing the letters and the different and varied Arabic fonts from Naskh, Ruq'ah and Kufic and others reaching to 50 fonts, which represent a difficulty in drawing the Arabic letter for non-native speakers (Irfan, 2008).

Al-Hallaq (2010) summarised the skills of Arabic calligraphy with skills related to drawing the letter according to its position in the word. This calls for getting rid of the lengthy definitions of letters (Ba, Ta, Ya, Lam and M) and not having the letter taking another form of another letter (Jeem, Ha, Kha) (Dal, Thal) (Ra, Za) (Ssad, Dhad) (A'in, Ghain) (Fa, Qaf) written in Arabic as follows consequently: (ج، ح، خ) (ذ، د) (ز، ز) (ص، ض) (ع، غ) (ف، ق). It is also important not to delete part of the letter and the letter dots, if there are any, and not to exaggerate the size of the letter.

Another important point is the skills related to drawing the word and skills related to the general form of the written text. The skills of drawing the word should not interfere between the letters of a single word, should not to leave a space or more space between the letters of a single word, should not to overlap between the letters of two words and the lack of separation between the letters of the word that is inseparable from others. Skills related to the general written form require a commitment to a unified pattern in drawing words in terms of small and large, taking into account the distance of

between fixed spaces words. Jaber (2002) added that there is also the skill of differentiating between the Ta'a Marbouta and the simplified Ta, and distinguishing between letters that are similar in shape.

Al-Hallaq (2010) and Khalifa (2004) mentioned the foundations and considerations that a teacher of Arabic calligraphy must take into consideration while teaching students. Arabic calligraphy teachers must specify the goal they want to achieve in teaching the Arabic calligraphy class. The goal should be written down in the preparation book for each class. Teaching Arabic calligraphy should be based on an appropriate curriculum based on organised repetition and purposeful training because calligraphy is a process in which repetition must take its clear role, and training should not be limited to calligraphy alone. The teacher should invest in every situation while teaching Arabic calligraphy. The study material on calligraphy should provide meaning to the student and fulfil his/her psychological and social needs, because whenever the student desires it, he/she progresses forward with success and confidence while he/she is practicing Arabic calligraphy.

After the student has practiced a handwriting model or pattern, the teacher should initiate feedback in a clear manner in which he/she specifically shows the difficulties in drawing some letters or words, and it is preferred to give this special attention by giving the student adequate training under his/her guidance. In Arabic calligraphy lessons, the student should be accustomed to maintaining the cleanliness of their notebooks, organising their writing and accuracy in the observation when simulating the model presented to them. The teacher should encourage the student who shows skill, mastery and cleverness in writing to encourage and reinforce his/her peers and to entice competition and participation. Additionally, the schools should create a group of gifted and creative students of Arabic calligraphy, provided they are supervised by a specialised teacher to charge them with writing boards, advertisements, banners, titles of school activities and wall magazines.

Most educators (Al-Hallaq, 2010; Jaber, 2005; Khalifa, 2004) agree with the steps of teaching Arabic calligraphy. First, the student is asked to take out his/her notebook and writing tools, and in the meantime, the teacher starts writing on the chalkboard the Hijri and Gregorian dates in good handwriting, and then divides the blackboard into two parts: A = section for the model script and B = section for explanation and clarification. Second is reading the model where the teacher reads the model clearly in front of the pupil, and then easily explains the meaning without prolonging it. Third is writing the model and explaining it artistically: The teacher draws students' attention and asks them to notice it as he/she writes in front of them the model on the board. Then, he/she writes the word on the left side of the board, indicating its parts in different colours, with the help of horizontal, vertical or curved lines to adjust the parts of the letters of the word and determine its directions.

Fourth is simulation: it is better to start with papers or notebooks other than notebooks of the models, taking into account the time and accuracy in simulating the printed model and free training before writing. Fifth is individualised education in which the teacher follows pupils one by one, walking among them, guiding them to the points of error and writing for them the forms with a coloured pen (often red) and explaining the right and wrong as possible. Sixth is general guidance: the teacher should select a common mistake among students, and then explain the error and its correctness. Finally, writing follow-up: the teacher asks the students to write the model script to encourage them to refine and improve their writing, provided the teacher continues to follow-up and guide them with each line to the end of the lesson.

As for non-Arabic speakers, they learn Arabic to get to know Arabs, their culture, behaviour and civilisation. The 9/11 attack on the United States was a gateway that opened a very wide field for learning Arabic among non-native speakers, as the number of Arabic language learners among

Americans alone increased in 2003 by 126%, while French increased by 2% and Spanish by 10% (Abdul Rahim, 2016). Al-Hamad (2014) stated that the reasons for learning Arabic among non-speakers are due to cultural, economic, religious and security factors. However, they had problems learning Arabic language because of the Arabic writing system in terms of direction, and the different shapes of the letter according to its position, the letters' points and diacritics. Al-Suhaimi (2015) dealt with unifying Arabic letters for non-native speakers by simplifying them in a way that suits them, without deviating from its rules, and making it easier for non-speaking users to keep pace with today's requirements.

However, the researcher intends to present the Arabic letter in a new way – and to the best knowledge of the researcher – this method has not been addressed before, which is modelling the letter (c) with all Arabic letters, except for the letter Alif (أ), to contribute to the development of handwriting performance. There is a great need for clear handwriting from the beginning stages of learning Arabic. Therefore, the researcher sought to find a solution for learners of Arabic speaking other languages at the start of learning the Arabic language. This study seeks to identify the effect of modelling the English (c) letter on developing the handwriting performance skills of learners of the Arabic language speaking other languages.

## 1.2. Related Literature

The study presents a new method for drawing the Arabic letters, which makes the learner confident while writing, so he/she is required to model the letter (c) in all Arabic letters that he/she writes. A good body of research, which varied in scope and objectives, was reviewed (e.g., Abdullah & Al-Hassan, 2015; Al-Faouri, 2005; Al-Hamad, 2012; Al-Jarrah, 2010; Al-Musnad, 2016; Al-Suhaimi & Othman, 2013; Amer & Al-Rababah, 2020; Dogan & Al-Omari, 2017; Iliga, 2009; Katebi, 2011; Salameh-Matar et al., 2019, Shimel et al., 2019) to narrow down the topic and aggregate the theoretical and empirical researches related to non-Arabic speakers.

Salameh-Matar et al. (2019) focused on the transfer effect of handwriting performance from Hebrew L2 to Arabic L1. The results of this study showed a negative effect of L2 (Hebrew) on L1 (Arabic) wherein bilingual students wrote significantly slower than their monolingual peers in handwriting speed but not in legibility.

Shimel et al. (2019) compared the effects of cursive handwriting programmes in improving letter legibility and form in third-grade students without identified handwriting problems. The results suggested that the method of handwriting instruction has a limited short-term impact on cursive letter legibility and form for children without handwriting problems.

Amer and Al-Rababah (2020) attempted to uncover how to achieve communicative competence in the writing skill among the learners of Arabic as a second language by untangling the overlapping between communicative competence and other similar concepts. He concluded that realising the grammar and vocabulary of the language, despite its necessity, is only a step in the process of communication.

Al-Suhaimi & Abu Al-Dahab (2014) aimed to identify the problems of students of the Institute of Arabic Language for Speakers of Other Languages at the Islamic University of Madinah in mastering the skill of writing and building an educational programme using multimedia, in addition to identifying its impact on the development of writing skills among them.

Al-Maliki (2012) identified the effectiveness of a proposed educational programme based on a comparative strategy for teaching Arabic to non-native speakers at the Institute of Arabic Language for Speakers of Other Languages at the Islamic University of Madinah.

Al-Faoury (2012) analysed and evaluated computer programmes specialised in teaching Arabic to non-native speakers, with the aim of teaching basic Arabic language skills such as writing and reading.

Al-Sheikh (2003) uncovered the weaknesses, deficiencies and negatives that hinder reading and writing, while the study of Saeed (2008) aimed at developing a proposed conception to address the deficiencies in teaching literacy skills.

Similarly, Al-Alfi (2005) analysed the defects in the handwriting of non-Arabic speaking learners. The results showed that 50.9% of those defects are letter-based. The study recommended adopting a new approach to teaching calligraphy, focusing primarily on clarity, without neglecting the aesthetic aspect.

Al-Juhani et al. (2015) identified the obstacles to using computers in teaching Arabic to non-native speakers from the point of view of the teachers of the Institute for Teaching Arabic to Speakers of Other Languages at the Islamic University.

### **1.3. Study problem and questions**

Arabic writing in the field of teaching Arabic to non-native speakers suffers from problems resulting from the many forms of the Arabic letters and its multiple drawings. In an attempt to secure a good drawing of the Arabic letters for learners, this study came to present a visual presentation of calligraphy and drawing letters based on modelling the letter (c), which is a letter that learners of Arabic speaking other languages know. This also came in response to the recommendations of many studies and researches to conduct more research in Arabic calligraphy for its learners who are non-native speakers.

The researcher noticed that pupils do not correctly draw the words that they write, and they may not know their original rules. No motive or sound habit drives them to make the writing clear or sound correct. Consequently, and after a long study, the graduates of the school did not improve their handwriting. However, the handwriting that learners use in their first school years remains intact with them and there is hardly any development or change seen. Hence, the current study tries to prevent the poor handwriting of learners of Arabic speaking other languages by training them on modelling the letter C in every Arabic letter written by Arabic language learners who speak other languages, excluding the letter Alef. Therefore, the current study seeks to answer the following questions:

1. What is the effect of modelling the English letter (c) on the development of handwriting performance skills among learners of Arabic speaking other languages?
2. What is the number of views required for calligraphy model visualisation to develop the skills of handwriting performance among learners of Arabic speaking other languages?

The following two supplementary hypotheses drove the collection of the subsequent data:

1. There are statistically significant differences at the level of 0.05 between the averages of handwriting performance skills among learners of Arabic speaking other languages according to the time.
2. There is a statistically significant correlation relationship at 0.05 between handwriting performance skills and the number of views required for calligraphy model visualisation.

### **1.4. Objective of the study**

The study aims to identify the effectiveness of letter (c) modelling in developing the writing skills performance of Arabic learners speaking other languages and to identify the number of views required for the line visual to develop their writing skills performance.

### 1.5. Significance of the study

The importance of this study lies in improving the quality of non-Arabic speaking students' learning of handwriting performance skills, which will help them in drawing the Arabic letters modelling the letter (c) in the electronic visual. The non-Arabic speaking learner shows the drawing of the letter (c) when writing all the Arabic letters except for the letter alif. Drawing of the Arabic letter for non-Arabic speaking learners needs to be very clear, so that they script it right and sound correct without error.

The study provides a method for the non-Arabic speaking learner to draw the Arabic letters correctly while writing to reach the goals and objectives and to reach the clear Arabic calligraphy and use it easily.

The results of this study will help developers of the Arabic language curricula for non-Arabic speakers to give Arabic calligraphy the attention and care it deserves. The results also will help teachers who may be lenient in teaching Arabic calligraphy to non-Arabic speakers to develop the students' handwriting.

This study also tries to direct the researcher's attention to the Arabic Islamic calligraphy with its correct drawing, which may lead more researchers to develop the handwriting performance of non-Arabic speaking learners in an era where handwriting is much less than it used to be.

### 1.6. Definition of terms

The study included the following procedural definitions:

**Modelling the letter (c):** For the non-Arabic speaking learner to draw a letter (c) in each letter of the Arabic language, excluding the letter alif.

**Handwriting performance:** Everything that the student writes in well-known Arabic letters, according to the specifications and standards known to scholars and specialists in the Arabic language.

**Learners of the Arabic language speaking a non-Arabic language:** They are the ones who have learned languages other than Arabic first.

### 1.7. Limitations of the study

This study was applied at the International School of Taif in the first semester of the academic year 2018/2017. The study sample was limited to a group of 15 female students in one class, chosen by the available sampling method. Handwriting performance skills concerned with the study means writing the Arabic letter using the modelling the letter (c), provided that they start writing from right to left and according to the writing movement contained in the visual model, and place it in its correct position from the line (under it or above it). As for the number of times the electronic visual calligraphy was viewed to train on drawing the Arabic letters, it took 5 weeks, with 40 minutes per session twice a week.

## 2. Research method and procedures

The current study used the quasi-experimental approach for one group to better suit the nature of the study. To analyse the results of the study, means and standard deviations were calculated, and the one-way analysis of variance (ANOVA) was used to determine the significance of the differences.

### 2.1. Study population and sample

The study population consisted of all female students ( $n = 15$ ) who spoke languages other than Arabic and had never learned Arabic, and were registered in the first semester of 2018/2017 at the

International School in Taif, KSA. The method of the study was conducted using the accessible way as the researcher resided in the same city. They were trained according to the teaching method based on the electronic visual model, and the teacher received training in the teaching method.

## 2.2. Study procedures

The following procedures were followed to implement and apply the study:

- The researcher reviewed the related literature to narrow down the topic and aggregate the theoretical and empirical research related to the topic.
- The instruments of the study were designed.
- The study population and samples were determined.
- The validity of the instrument was established by presenting it to competent referees and statistical treatment.
- The stability of the study instrument was calculated.
- The students were trained on the attached Arabic calligraphy visual, which included all the Arabic language letters that underwent post-test.
- Classifying data in special tables.
- The results of the study were obtained through appropriate statistical analyses.
- The findings of the study were analysed and discussed according to the hypotheses of the study.

## 2.3. Instruments

The study instruments included electronic calligraphy visualisation and a handwriting performance test for non-Arabic speakers.

### 2.3.1. Electronic calligraphy visual

It started with electronically presenting the letter (c) to non-Arabic speakers and to show the Arabic letter from where the learner did not expect. The researcher invented it and it was prepared according to the following steps:

1. The researcher drew by hand the letter (c) and illustrated it in her papers, and began modelling from which to write all the Arabic letters.
2. The researcher started working on papers and gave each letter its sheet.
3. After all the letters were completed manually, the researcher began to meet with specialists in computer science to explain to them, and to show them the work manually. The researcher was concerned with the angle or bend of the Arabic letter and the letter (c), but wanted to benefit from the experience in preparing the electronic visual. After several meetings, the specialists were able to present an initial electronic image, and the researcher kept adjusting what she saw joined by several specialists in the Arabic language so that the electronic visual came out in its final version. It included all of the Arabic language letters except for the letter alif because it requires a single letter (c); so the researcher left it to the learners to bring it to her, and to be an opportunity for them to contemplate and imagine.

### 2.3.2. Written performance test for non-Arabic speakers

A test was administered to measure the handwriting performance skills of the sample of the study. It included drawing the Arabic letters correctly (the shape of the letter), starting to draw the Arabic letter from right to left and writing the correct letter above or below the line. The final form of the test was to write the Arabic letters correctly according to the rules of Arabic calligraphy.

#### *2.4. Validity of the writing test*

To verify the validity of the test, it was presented in its initial form to a group of experts specialised in teaching Arabic to non-Arabic speakers in the universities (Yarmouk, Britain and Umm al-Qura). The experts were asked to validate the content of the instruments concerning the instrument's items, appropriateness and suitability to the purposes of the current study. The experts' comments and recommendations were studied carefully and taken into account in amending the final version of the instrument. The researcher wanted a percentage of agreement (match) to reach up to 80%, but the agreement between the experts reached 88%. The researcher found the percentage appropriate to complete the study. Their remarks focused on the number of letters that the researcher gave in the test and on the letters that fell off the line or just written above it. The researcher took their notes and then the test came out in its final form, meeting all the required modifications.

#### *2.5. Reliability of the writing test*

Reliability was tested and refined through the test–retest method on a pilot group of 13 learners who are non-Arabic speakers who had never learned it before and were selected randomly and left out later from the sample of the study. The test reliability coefficient was estimated using the internal consistency method and found to be 0.87, which was considered suitable to conduct the study.

#### *2.6. Study variables*

The current study included the following variables:

- Independent variable: modelling of letter (c) in the electronic visual.
- Dependent variable: development of handwriting performance skills among learners of the Arabic language speaking a non-Arabic language.

#### *2.7. Statistical processing*

To test the first hypothesis, means and standard deviations of the scores of handwriting performance skills for the study sample according to the period were used. The result of the single ANOVA test was calculated to determine the significance of the differences between the degrees of handwriting performance skills of the study sample according to the period. To test the second hypothesis, Pearson's correlation coefficient was used to indicate the relationship between handwriting performance skills and the number of modelling applications (\*Statistically significant at 0.05).

### **3. Findings and discussions**

The first hypothesis was tested, which stated that there are statistically significant differences at the level of 0.05 between the means of handwriting performance skills of Arabic learners speaking other languages according to the period of time.



Table 1. Mean scores and standard deviations of the scores of handwriting performance skills for the study sample according to the time period

| Variable                       | Time period | Number | Mean  | Standard deviation |
|--------------------------------|-------------|--------|-------|--------------------|
| Handwriting performance skills | 1 week      | 15     | 5.27  | 1.53               |
|                                | 2 weeks     | 15     | 7.47  | 1.72               |
|                                | 3 weeks     | 15     | 9.00  | 0.75               |
|                                | 4 weeks     | 15     | 10.73 | 1.22               |
|                                | 5 weeks     | 15     | 11.20 | 1.08               |

It is clear from Table 1 that there are apparent differences between the scores of written performance skills of the study sample according to the time period, as it was 5.27 in the first week, while it increased in the fifth week to 11.20. To determine the significance of these differences, a single ANOVA test was used, and Table 2 shows the results of this test.

Table 2. Results of the single ANOVA test to determine the significance of the differences between the degrees of handwriting performance skills of the study sample according to the time period

| Variable                       | Source of variance | Sums of squares | of Freedom degree | Mean Square | F-value | Indication level |
|--------------------------------|--------------------|-----------------|-------------------|-------------|---------|------------------|
| Handwriting performance skills | Between groups     | 366.667         | 4                 | 89.167      | 52.014  | 0.000            |
|                                | Within groups      | 120.000         | 70                | 1.714       |         |                  |
|                                | total              | 476.667         | 74                |             |         |                  |

Table 2 shows that there are statistically significant differences at the level of 0.05 between the marks of handwriting performance skills of the study sample according to the duration of time. The significance level value reached 0.000, which is a value smaller than the level of significance (0.05) and a statistically significant function. To determine the direction of differences, the post-test (Scheffe) was used. Table 3 shows the direction of these differences.

Table 3. Result of choosing (Scheffe) to deviate the trends of differences according to the time period

| The Variable                   | Time period (I) | Time period (J) | Difference between the two means | Significance |
|--------------------------------|-----------------|-----------------|----------------------------------|--------------|
| Handwriting performance skills | 1 week*         | 2 weeks         | 2.20                             | 0.001        |
|                                | 2 weeks*        | 3 weeks         | 1.53                             | 0.045        |
|                                | 3 weeks*        | 4 weeks         | 1.73                             | 0.016        |
|                                | 4 weeks         | 5 weeks         | 0.47                             | 0.916        |

\*Statistically significant at 0.05. Table 3 shows that there are statistically significant differences at the level of 0.05 between 1 and 2 weeks (in favour of 2 weeks), between 2 and 3 weeks (in favour of 3 weeks) and between 3 and 4 weeks (in favour of 4 weeks). The significance level values reached 0.001,

0.045 and 0.016, respectively, which indicates improvement in linear performance skills in a statistically significant manner over time.

It is also evident that there are no statistically significant differences at the level of 0.05 between 4 and 5 weeks. The significance level reached 0.916, which indicates the stability of the improvement in handwriting performance skills after the end of the fourth week.

The second hypothesis was tested, which states that, 'There is a statistically significant correlation relationship 0.05 between the skills of handwriting performance and the number of times the modelling'.

Table 4. Pearson's correlation coefficient to indicate the relationship between handwriting performance skills and the number of modelling applications

| First variable                 | Second variable                              | Correlation coefficient | Significance level | Relationship strength |
|--------------------------------|--|-------------------------|--------------------|-----------------------|
| Handwriting performance skills | The number of times the modelling is applied | *0.54                   | 0.04               | Medium                |

\*Statistically significant at 0.05.

Table 4 shows the existence of a positive, direct, statistically significant correlation at the level of 0.05 with a medium degree between the skills of handwriting performance and the number of times the modelling is applied. The significance level value is 0.04, which means higher writing performance skills when more modelling is applied.

### 3.1. Results related to the first hypothesis

The results of the first hypothesis showed the existence of a statistically significant effect of the teaching method based on the electronic visualisation model on the development of handwriting performance skills among learners of the Arabic speaking other languages. This result can be attributed to the opportunity provided by the electronic visual to stabilise the image of the Arabic letter and to review the stages of writing it continuously, starting with cutting the letter (c) and passing it by drawing a new letter in a new image, which the non-Arabic speaking learner has not experienced. The visual presented the Arabic letter in one form until its drawing and image are settled in the minds of the learners. This is because the multiplicity of forms of the Arabic letter is a great difficulty for learners to falter. It is also attributed to the fact that the visual presented the drawing of the Arabic letter according to a new methodology, which is modelling the letter (c).

This is the first time according to the researcher's knowledge that the Arabic letters are presented in this way. It may also be attributed to the presentation of the electronic video, the Arabic letter, on the one hand, and not enumerating it on the other. This is because there are many types of Arabic fonts and it is difficult to draw the Arabic letter. It may also be attributed to presenting all Arabic letters in the Naskh script, only due to its simplicity and solidity between the other lines and for the ease with which the pen moves. Additionally, it is distinguished by the beauty, splendour and clarity of its letters; it is the most used of all learners; it makes it easier to read words and sentences; it shows the letters having teeth clearly; and also because the size of the letters is equal with this type of fonts. The electronic visual presented the Arabic letters in the Naskh script because it presents the letters that stand on the lines and the letters descending from the line (ن، ص، ل، ي، ش، ر، و، ق، ج، م، ع، ه).

As for the letters (ق،س،ى،ل،ص،ن)، they are written separately. The letter haa is written as a single item as it is written to the metaphor for the Hijri year and denotes it. It is written as (هـ) as this does not need to be considered a symbol. These were taught to learners easily and smoothly. This seems to be consistent with previous studies (Abdullah & Al-Hassan, 2015; Al-Alfi, 2005; Al-Faouri, 2005; Al-Hamad, 2012; Al-Jarrah, 2010; Al-Musnad, 2016; Al-Suhaimi & Othman, 2013, 2014, 2015; Al-Tohamy, 2010; D, 2016; O, 2016; Dogan & Al-Omari, 2017; Ilya, 2009; Katebi, 2011; Sheikh, 2003; Saeed, 2008). Thus, the electronic visual achieved the purpose for which it was designed.

### 3.2. Results related to the second hypothesis

The results of the second hypothesis showed the existence of a statistically significant effect of the teaching method based on electronic visualisation on the development of the handwriting performance skills of Arabic learners speaking other languages. This may be attributed to the effect of the teaching method used, which led to a tangible improvement in the degree of mastery of the handwriting performance skills related to drawing letters among the study participants who experienced the teaching method utilised in this study.

The results also showed the effectiveness of increasing the number of times the model is applied. This is due to the use of an electronic visual that has been managed by a computer, and this confirms the importance of the computer in teaching Arabic learners speaking another language, which is confirmed by previous studies (Abdel-Moneim, 2006; Al-Faouri, 2012; Al-Maliki, 2012; Al-Sheikh, 2003; Al-Suhaimi, 2015; Khasawneh, 2005). The results also showed improvement in learners' ability to perform handwriting as the number of presentations increased.

This was made available to the learners because the letters were presented to them according to an electronic visual that relied on modelling the letter (c) in a new way from which all the Arabic letters were drawn. The results of this study seems to be in line with the results of previous studies (Abdullah & Al-Hassan, 2015; Al-Faouri, 2005; Al-Hamad, 2012; Al-Jarrah, 2010; Al-Musnad, 2016; Al-Suhaimi & Othman, 2013; Dogan, 2017; Iliga, 2009; Katebi, 2011).

## 4. Conclusion and recommendations

Based on the findings of the study, the following recommendations are put forward:

- Apply the teaching method based on the calligraphy visualisation devised by the researcher in teaching non-Arabic speakers.
- Hold workshops for Arabic teachers who teach non-native speakers in order to train them on the steps of writing using this visual.
- Include Arabic language books for non-native speakers with the visual script for learning models.
- Conduct similar studies with other skills such as reading.
- Conduct comparative studies to uncover the impact of the visual on developing the calligraphy and writing skills of Arabic learners speaking other languages.

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