



THE IMPACT OF DIGITAL STORYTELLING ON MOTIVATION AND ACHIEVEMENT IN TEACHING SCIENTIFIC CONCEPTS FOR PRE-SCHOOL STUDENTS

Nader S. Shemyⁱ

Associate Professor, Dr.,
Instructional Technology
Arab Open University (AOU),
Oman
Education Faculty,
Fayoum University,
Egypt

Abstract:

The study aimed to measure the impact that storytelling has on motivation and achievement in teaching kindergarten children's scientific concepts. An experimental design was used to achieve such an aim. It was implemented on a sample of 40 children (KG2 in specific). The children were randomly divided into two groups of 20 (control and experimental). The researcher designed the digital storytelling in the experimental treatment stage after selecting one of the national curriculum's scientific concepts for the pre-study stage. The results revealed a difference in academic achievement between the pre and post-test for the benefit of the experimental group, which indicates the practical effect of using digital storytelling in teaching the scientific concepts of this stage. The motivation scale was also applied to the research sample, which motivated students to learn scientific concepts after using digital storytelling. This indicates the effectiveness of this method to attract children's attention and increase their focus and motivation. Moreover, give meaning to these scientific concepts.

Keywords: digital storytelling, motivation, scientific concepts, pre-school

1. Introduction

Storytelling is one of the most enjoyable literary arts that have captured human beings' attention since eternity. Human history is not without this literary art. It is an essential part of all cultures, which has been used to send moral, social, political, entertainment, religious messages, and other fields. It is a tool that makes us automatically attract when

ⁱ Correspondence: email nshemy@aou.edu.om

listening to it, and this art is inherently present in our conversation, and it is a skill in which linguistic and emotional intelligence is mixed to move thoughts and feelings towards the main topic of the story (Thursday, 2019), and perhaps the Chinese experience has confirmed the effectiveness of the storytelling method In teaching moral education to children; this is based on the theories of moral development, as the vocabulary and concepts in this field are abstract for them, and they are embodied in the style of storytelling, the results of which indicated the development of motivation and increased in children's achievement, and their understanding of the values and ethical principles that were taught (Nair, Yosuf, Hong, 2014),

With the advent of modern technologies that have made a quantum leap in many fields, storytelling has gained its share, which has added to the story a new framework in presentation, known as digital storytelling. It can address all senses through the use of multimedia in presenting the story. It considers learners' patterns and motivates them, and helps them deeply understand the meaning by enhancing their cognitive experiences (Li, 2016). It is worth noting that digital storytelling has emerged remarkably in different areas of life. It has a wide range of use. Its use is not limited to the scope of education only. It has been used in health, tourism, awareness, and other fields, even beyond humanitarian and societal issues.

For example, but not limited to: the digital storytelling was used to instill and root the national identity of immigrants in their souls, and despite the different cultures in the current town, this method has proven its effectiveness by addressing all groups in a manner commensurate with everyone (Dravin, Norton, 2014). Digital stories have also been used in social justice, as Matias & Grosland (2016) pointed out in their study about digital storytelling in racial discrimination in the United States of America. Several digital story stories were designed and produced that aim to share emotions with others regardless of race. However, this method has had a large share of use in education, and it has proven effective in motivating learners and attracting their attention. It is used for all educational stages, is not limited to one stage without the other, and is characterized by diversity in presenting concepts and facts. Using multimedia, such as sound, image, music, and video clips, in which the narrator's voice moves between the events and plots of the story, can be presented in several forms, including: visual, touch collection, written (Brener, 2016).

This method has contributed to enhancing various skills, such as communication, critical thinking, motivation, and initiative in partnership with others. They take the initiative to highlight societal issues and be more active and motivated to find solutions to them because they are part of the community. Their sense of belonging to it (Niemi & Multisilta) digital storytelling also contributed significantly to realizing the meaningful learning principle for the scientist (Ausubel), one of the cognitive school owners. Cognitive, which is known as the process of inclusion, in which the learner can generalize and transfer these concepts and knowledge to new situations, stems from understanding, not memorization (Baqi'i, 2014).

Robin (2016) points to the effectiveness of the role of digital storytelling in supporting the educational process, by enhancing learners to produce their own digital storytelling, which develop their knowledge, and to search for information and knowledge through various sources, as it helps them to organizing and sequencing ideas, expressing views and opinions, and they can share their stories with their peers, and one of the challenges that teachers face in the educational process is teaching scientific concepts to children, as indicated by both Hoffman, Collins, Schickedanz (2015) that children do not learn just by reading these concepts and explaining them in an abstract way, because their understanding is limited to comprehending these concepts at this age, as they find them complicated and boring, and they also emphasize the importance of forming the meaning of these abstract concepts in the minds of children presenting it in exciting ways to attract their attention and motivate them to interact with the educational content. Both (Diamond, Sunset, and Ritesys, 2016/2017) believe that pre-school is one of the different stages. It is essential for the growth of the individual in various aspects. It is a fertile field for inculcating concepts, values, and virtues, as children have common developmental characteristics at this stage. They are learners characterized by movement and activity, and their attraction and love to try everything new, as they can learn if the materials are available to them. Attractive media and diversification in the way knowledge and concepts are presented because their focus is limited. They love to explore the surrounding environment. They also increase questions to get to know everything that surrounds them. This should be under teachers' or adults' guidance and gradually walk them through learning concepts Scientific, from simple to more complex concepts. The more the teacher believes in children's abilities and potentials in learning, the greater his interest in cognitive development. More specifically that cognitive curiosity is one of the essential features of this stage.

2. The Problem

The researcher noticed the lack of children's attraction while presenting scientific concepts, especially those containing a series of organized scientific steps: (How does a seed grow into a plant? How does rain come?). Moreover, other scientific concepts are included in this stage's curricula and their lack of attraction towards educational content. This led to the emergence of some behavioral problems that distracted other children and distracted the teacher. The researcher also noticed the children's inability to relate these concepts to the external environment or their lives' realities.

In light of this, it was more appropriate to change the types of educational aids used, and to change the way these concepts are presented in attractive ways that are likable to children, which can make them present in the mind throughout the morning session, and from the researcher's point of view that these concepts need to be presented using modern technologies, In which these concepts are clarified in a series, so that children can easily understand, absorb and retrieve them with ease, which in turn increases children's motivation to learn, especially since this generation is called the

digital generation (Farajun, 2019), and there are many modern technological methods and tools that can be used in different educational situations, and from the researcher's point of view, one of the most appropriate ways to present these concepts is to use a digital storytelling strategy, which includes various types of media, such as sound, image, movement and text, because of their positive impact on children, which in turn makes them easier for them. Understand these concepts and easily remember them.

The researcher was able to formulate the research problem: the lack of children's motivation to learn the scientific concepts included in the national curriculum for pre-school learning, which negatively impacted academic achievement.

2.1 Research questions

This paper attempts to answer the following main question:

- 1) What is digital storytelling's effect on motivation and academic achievement in teaching scientific concepts among pre-school children?

The main question is divided into the following sub-questions:

- 1.1 How is digital storytelling employed in teaching scientific concepts to pre-school children?
- 1.2 What is the effect of digital storytelling on motivation in pre-school children?
- 1.3 What is the effect of digital storytelling on the academic achievement of pre-school children?
- 1.4 What are the criteria for designing and producing a digital story?
- 1.5 What are the design stages for producing digital storytelling in developing scientific concepts among pre-school children?

2.2 Research aims

- 1) Using digital storytelling in teaching scientific concepts to pre-school children.
- 2) The effect of digital storytelling on motivation in pre-school children.
- 3) The effect of digital storytelling on academic achievement among pre-school children.
- 4) The importance of standards in designing and producing the digital story.
- 5) Designing and producing a digital storytelling using one of the design models in developing scientific concepts in pre-school children.

3. Research methodology

The current research relied on the quasi-experimental approach to study digital storytelling's effect on motivation and academic achievement in teaching scientific concepts among pre-school children.

3.1 Research variables

First: The independent variable: Digital Storytelling.

Second: Dependent Variables: The search was limited to two dependent variables: motivation and academic achievement.

4. Theoretical framework

4.1 Digital storytelling

It is an extension of the actual narrative of storytelling mixed with a technological character, whereby digital media such as video clips, audio, images, and written texts are used in order to achieve educational learning objectives interestingly and attractively, and it is known as: it is a powerful magic craft that does not transfer hearing to an exciting journey in not only is the world of imagination, but it can also reveal secrets of human behavior, inspiring attendees with a desire to do noble deeds (Miller, 2008, p. 4)

There are several classifications for digital storytelling, which are classified according to use by content, design, and Mahdi (2018) indicated about these classifications and the classification by content will be covered in some detail, as follows:

4.1.1 Digital audio storytelling

It is considered one of the oldest types in which storytelling was introduced. However, it is a valuable learning method. It expands the range of imagination for the listener, as it works to form educational experiences in the cognitive structure by translating the audio messages. The listener creates mental images proportional to the audible words involved in digital storytelling, and the listener creates an interconnected network between the voice message and the mental image.

4.1.2 Digital visual storytelling

This type includes pictures and graphics. These drawings take two forms, either static or moving. They also include visual and audio effects and other attractive elements; the learner can receive information with more than one sense.

4.1.3 Written digital story storytelling

It is one of the necessary learning tools represented in written texts. It helps learners develop the thinking process, extract content and meaning from written texts, and understand concepts and information from the written content.

Digital storytelling consists of seven essential elements, which are the starting point for the design process, and which have an influential role in producing an attractive story that interests the audience (Rahimi & Yadollahi, 2017), as follows:

- 1) Point of view: It is the main point in the story, as the story has various points of view, and consideration should be given to the audience's viewpoints so that harmony occurs in all points of view.
- 2) Emotional content question: The question is asked to attract the audience's attention and maintain the audience's interest from the beginning of the narration to the end of the story, which is answered at the end of the story.

- 3) Emotional content: These are serious issues that spring to life and impact the audience to increase their interest and link them to the story.
- 4) The gift of voice: It is a gift through which the narrator can positively influence the audience, and it represents the element of attraction in the story and its main engine.
- 5) The soundtrack: It is one of the essential elements supporting and expressing sincere feelings in digital storytelling narration. It has an active role in attracting the audience's attention.
- 6) Economic: The use of appropriate digital media to produce the story without exaggerating the number of these media, as the successful digital story does not depend on the amount of digital media used. However, it depends on how it is used to achieve the goal of producing the story.
- 7) Progress / Pacing: It is the appropriate consistency of the elements of digital storytelling so that the events of the story are not at one constant pace; So that the story is not monotonous, but this pace changes appropriately with the events of the story, the soundtrack, the voice of the narrator, and the appropriate period for the appearance and presentation of the image so that this pace is appropriate and clear and affects the emotional side of the audience positively.

4.2 The importance of digital storytelling in education

Alismail's study (2015) indicates the importance of using technology in education in general, as specialists stress the importance of awareness of this method's effectiveness in the educational situation because of its influential role in achieving educational goals more comfortable of multimedia. The importance of integrating digital storytelling in education in particular, because of its importance, as follows:

- It saves time and effort for the teacher to present educational content in a new way, far from being stereotyped.
- It helps to convert abstract concepts into concepts understandable to learners.
- Help to organize learners' ideas in sequence and arrangement.
- It helps to understand complex information and concepts, which are difficult for learners to understand.
- It gives learners opportunities to interact and share and to foster peer-to-peer cooperation through group activities.
- It allows learners to share their work on the web to publish the story he produced.

Moreover, another study by Abdul-Moamen (2018), entitled "Using the digital story in developing some health concepts in kindergarten children," touched on the importance and benefits of using digital storytelling in educating children at this stage, as follows:

- Add fun and eliminate boredom in the educational situation.
- Helping learners focus and capture their attention.
- Adding an element of excitement and suspense to the learners.
- It was addressing more than one sense at a time.

- Taking into account individual differences, the child can replay the story several times.
- Bringing the child closer to reality by embodying the characters.
- Make the child awake, active, and lively throughout the educational process.

4.3 Digital storytelling production standards

It refers to the set of specifications that are based on knowing the quality of storytelling and judging it. It is the benchmark for measuring digital children's storytelling quality from several aspects, such as form, content, and output (Al-Khalis, 2019). As Sersk (2019) pointed out in his study on the evaluation of digital storytelling for the elementary stage, where the evaluation included technical criteria, such as the sound corresponds to the presentation of the images, as well as the importance of compatibility of the images with the scenario, there are some criteria for digital storytelling production for the elementary stage, as follows:

- Coherence and logic in presenting digital storytelling events.
- Ease of digital storytelling and suitability for age characteristics.
- The simplicity of the idea involved in digital storytelling and its suitability for age characteristics.
- Appropriateness of educational objectives for digital storytelling.
- Adapt the characters involved in digital storytelling with the characteristics of students for this stage.

Al-Amri's study (2019) indicates to confirm the effectiveness of digital storytelling on developing motivation among secondary school learners who are learning another language, other than the mother tongue, as they face some challenges in verbal language communication, and it is worth noting that one of the best means of acquiring language is to practice it with others through direct contact with them, so the researcher used the cooperative learning strategy by telling the digital story, which consisted of three stages, the first stage was over the course of four weeks in which the learners participate as groups to choose the topic of the story, compose and write it, followed by the production phase, in which the written text was converted into video clips, after the learners took pictures and incorporated them into a video clip with recording the sounds, which lasted for a period of six weeks, and in conclusion the post stage the production, which was for a period of two weeks, in which the final product was presented for each group in front of their peers, and the stories were published on YouTube, and from the above, the results indicate that the use of digital storytelling has an influential role in motivating learners, as learners acquired the other language through direct contact with their peers. Using this method, Kubravi, Shah & Jan (2018) emphasize digital storytelling's role in motivating learners and developing critical thinking when used in problem-solving strategies. Collaborative science is an attractive element for its various digital media such as text, audio, image, and video clips, used for personal storytelling and narration of historical facts. Setiyorini (2020) pointed out in his study, which was about using digital storytelling on motivation. Self-learning for learners to learn new vocabulary in the

elementary stage, and he emphasized that learning this vocabulary is the main factor in language learning for this stage. However, he noticed that many students lack self-motivation to learn this vocabulary, which is a boring source during the educational situation. He also pointed out the need to present new vocabulary in an attractive and stimulating way for children. So, he used digital storytelling, which is the best way to teach this vocabulary. The results showed that there is a significant difference. It is clear for the experimental sample's motivation (before/after) the use digital storytelling in teaching new vocabulary. In another study on the positive effect of digital storytelling in motivating pupils and pushing them to write, which was applied to fourth-grade students, as Lobello (2015) indicated, skill writing is one of the necessary skills students acquire at this stage. The emphasis on them has become more stringent. When the researcher conducted some exploratory interviews for several students, some of them explicitly referred to the words "I hate writing" or "my hand hurts me." In general, their attitudes were negative towards this skill. Through digital storytelling, which had an influential role in motivating pupils, the results showed that this method's effectiveness did not only contribute to developing their motivation. Moreover, this was also confirmed by Al-Shehri (2018).

One of the studies indicates digital storytelling in teaching chemistry with a problem-solving method for the secondary stage, which stimulated their minds to reach the optimal solution after applying the problem-solving method's practical steps (Peleg et al., 2018). Abiola (2014) study which was conducted on nine elementary schools in Oyo, USA, indicates digital storytelling in teaching moral values. It is an attractive tool for learners' concerns about their learning styles to understand information and facts deeply. He also applied the achievement test tool, which measures three mental levels, namely: remembering, comprehension, and achievement, and the results showed an effective effect of using this method on pupils' achievements in moral education, as another study confirmed the previous study and added that the playing style was used using digital storytelling, which added an atmosphere of fun and happiness. During children's education, children worked on composing stories for different topics. They acquired debate and negotiation skills with peers with a mixture of humor, fun, and unlimited imagination. The results indicated that the increased academic achievement was in the experimental group's interest during the learning process (Cavanaugh et al., 2017). The study of Yurt & Aktas (2017), together with the previous study results in terms of demonstrating the enthusiasm of learners using this method in education. Researchers in a Turkish university provided educational content using digital storytelling. They noted the learners' enjoyment and absorption of the knowledge and information presented to them, and it was reflected. This is positively about their production and performance, so the learners in groups produced a number of digital story stories with various topics using different applications, and it is worth noting that motivation is closely related to achievement, according to the study of Al-Sunaidi (2016) and Al-Shehri (2018), which were discussed previously in the section on studies related to motivation using digital storytelling, which the researchers emphasized on the impact of using this

method on the academic achievement of the learners positively, after applying the test to them, which had positive results in favor of the experimental group, as indicated by the study of Özpınar, Gökçe & Yenmez (2017), entitled "The impact of digital storytelling on mathematics education on academic achievement and the views of teachers and students" in which researchers used digital storytelling in explaining abstract concepts in mathematics, embodying them in the realities of learners' lives, and linking them to daily life, as the sample was divided into two groups: control and experimental, according to the average degrees of achievement in mathematics, and they prepared and produced a number of stories digital stories by subjects in mathematics for the eighth grade, and after the research experience, the results were positive in favor of the experimental group in academic achievement after the post-test, and some of the learners' opinions were about using this method in education, as they expressed their understanding of information better, and the examples from real life was more exciting and stimulating for them, and their participation in group activities and discussion with their peers were among the positives they discussed, with the presence of Some observations, such as: the sound was not compatible with the movement of the images, and the tone of the characters' voice was not good enough, which is one of the points addressed by the criteria that should be taken into account when producing digital story stories, which were previously covered in the research. The teachers were positive; they explained that this method helped them attract the learners' attention and add the element of fun in the educational situation. It stimulated the learners to learn, which in turn led to an increase in the academic level. They also noted that the learners' participation with their peers positively through the exchange of information and experiences between them.

5. Research hypotheses

The first hypothesis: There are statistically significant differences at a significance level of 0.05 between the mean achievement scores of children of the control and experimental groups in the achievement test's pre-measurement.

The second hypothesis: There are statistically significant differences at a significance level of 0.05 between the mean achievement scores of the children of the experimental group in the pre-measurement and the averages of the achievement scores of the children of the experimental group in the post-measurement of the achievement test in favor of the post-measurement.

The third hypothesis: There are statistically significant differences at a significance level of 0.05 between the mean achievement scores of children of the control and experimental groups in the post-measurement of achievement test in favor of the experimental group.

The fourth hypothesis: There are statistically significant differences at a significance level of 0.05 between the mean scores of the children of the experimental

group in the pre-measurement and the mean scores of the experimental group children in the post-measurement on the motivation scale in favor of the post-measurement.

The fifth hypothesis: There are statistically significant differences at a significance level of 0.05 between the mean scores of children of the control and experimental groups in the post-measurement on the motivation scale in favor of the experimental group.

6. Empirical treatment of independent variables of research

The researcher chose one of the academic units for the pre-school education curriculum entitled (Health and Healthy Food) and chose one of the lessons that carry one of the scientific concepts. He noticed that they are presented to children in the form of simple information. The researcher specifically chose a topic entitled (Fast Food), which includes many health instructions, which teachers provide superficially as general information. They are not given the right to present it by following up with the teachers themselves. This topic will be presented in a digital storytelling style.

6.1 The phases of instructional design for digital storytelling

6.1.1 Analysis phase

This stage includes analyzing the target group's characteristics, the learning environment, and the educational content.

6.1.2 Design phase

The researcher has identified the main topic of the educational content, which will be presented to children, and has devoted the digital storytelling that has been specifically produced to present this topic, which is an introduction to the problem-solving method, by proposing a position from the reality of the child's life, and realize that there is a problem that requires a solution. Then the children define the problem, then they begin to develop hypotheses by stimulating their previous experiences in the structure cognitive, and here the teacher should encourage the children to answer and discuss them, taking into account their abilities and individual differences between them, and then start testing the validity of the hypotheses, followed by evaluating the most appropriate solution that was selected.

6.1.3 Development phase

The researcher composed a digital story specifically for the subject of educational content and took into account the developmental characteristics of children of this stage so that its characters are few. The researcher began writing the script of the story, and then presented the story to several specialists in the field of childhood, and made some adjustments to it according to the opinions of specialists; after that, the researcher drew the characters and recorded the sounds, as the following programs were used: Adobe Photoshop, PowToon.

6.1.4 Implementation phase

The researcher conducted implementation with the teacher, who will explain to the experimental group. This stage helps identify some gaps during the educational situation's implementation, filled during the actual research.

6.1.5 Evaluation phase

The researcher presented the digital story that was produced to several specialists in the pre-school education stage to ensure the design's quality is appropriate and its compatibility to achieve the educational goals.

6.2 Research Tools

- 1) The researcher prepared the achievement test that measures the educational situation's cognitive aspects using digital storytelling.
- 2) The researcher prepared the Self-motivation scale that measures the motivation in the educational situation using digital storytelling.

6.3 Research sample and experimental design

The study population includes children of the pre-school education stage in a school in the governorate of Muscat, where the study sample consisted of (40) children; they were divided into two groups: an experimental group consisting of (20) children and a control group consisting of (20) children.

7. Research results and interpretation

7.1 The extent of the validity of the first hypothesis

To verify the validity of this hypothesis, the researcher tested (T) student for two independent samples (Independent -samples T-test), where the differences between the averages of achievement scores of the children of the experimental and control groups were calculated on the total score of the achievement test in the pre-measurement, as shown in the following table:

Table 1: The value of pre test (t-test)

| Group | Test | No | Mean | S.D. | T | Sig. (2-tailed) |
|--------------|-------------|----|-------|------|-------|-----------------|
| Experimental | Achievement | 20 | 11.75 | 2.77 | .1309 | 0.158 |
| Control | | 20 | 8.95 | 1.49 | | |

It is noticed from the previous table that the value of (t) reached (1.309) at the probability value (0.158), which is higher than the level of significance adopted in the research (0.05). Moreover, therefore, the hypothesis was rejected, meaning that there are no statistically significant differences at the level of significance 0.05 between the averages of the achievement scores of the children of the control and experimental groups in the pre-measurement of the achievement test meaning that the two groups are equal. The research sample was adjusted, and it is suitable for applying the actual experiment.

7.2 The second hypothesis test

To verify the validity of this hypothesis: the researcher calculated the differences between the mean achievement scores of the children of the experimental group in the pre and post-measurement on the total score for the achievement test, as shown in the following table:

Table 2: The value of pre/post test (t-test)

| Measurement | Test | No | Mean | S.D. | T | Sig. (2-tailed) |
|-------------|-------------|----|-------|------|--------|-----------------|
| Pre | Achievement | 20 | 9.66 | 2.49 | 10.152 | 0.0001 |
| Post | | 20 | 17.58 | 0.86 | | |

It is noticed from the previous table that the value of (t) reached (10.152) at the probability value (0.0001), which is less than the level of significance adopted in the research (0.05). Furthermore, this indicates the validity of the hypothesis. Moreover, this indicates the impact when using digital storytelling in teaching scientific concepts, through which the target concept became clear to the children. The children received information according to their different styles. The researcher designed digital storytelling to include different media represented by sound, image, video clip, and written text. This hypothesis also proved correct that digital storytelling presents a quantity of information in a short period and in a sequence that achieves the meaning of these concepts, which sometimes it is complicated for children if it is presented in the traditional form, and this is what Hoffman, Collins, and Schickedanz (2015) have indicated about the necessity to form meaning for scientific concepts that may be difficult for children to understand.

7.3 The third hypothesis test

To verify the validity of this hypothesis, the researcher conducted an Independent-Samples T-test, and the differences between the mean scores of the achievement of the children of the experimental and control groups were calculated on the total score of the achievement test in the post-measurement. As shown in the following table:

Table 3: The value of post test (t-test)

| Measurement | Test | No | Mean | S.D. | T | Sig. (2-tailed) |
|--------------|-------------|----|-------|------|--------|-----------------|
| Experimental | Achievement | 20 | 17.16 | 0.86 | 20.734 | 0.0001 |
| Control | | 20 | 8.67 | 1.43 | | |

It is noticed from the previous table that the value of (t) reached (20.734) at the probability value (0.0001), which is less than the level of significance adopted in the research (0.05), and this is evidence of the effectiveness of using the digital storytelling compared to the traditional method when presenting scientific concepts to which the children were attracted and kept their focus on the educational content, and the researcher believes that the storyty of this strategy mixed with the technological character contributed to presenting the concept in a smooth and attractive way to children, meaning that the validity of the hypothesis does not depend on one factor only, but instead it is an

interconnected series of factors, and this is what the researcher actually observed from the exact difference between the performance of the two groups of the test, and this is due to the children's enjoyment and their attraction towards the educational content, which reflected positively on their understanding of the content of the presented material by using digital storytelling in presenting scientific concepts, and there are many results of studies that agree with the validity of this hypothesis, so the results of Al-Sunaidi study (2016) and Al-Shehri (2018) confirm the high achievement of learners. After applying the digital storytelling to the post-test training for the benefit of the experimental group. The study results are in agreement (Cavanaugh et al., 2017), which indicated an increase in students' academic achievement using this method. The children enjoyed writing stories and gained them the skill of discussion and exchange of opinions. This showed positive results in favor of the experimental group after applying the test in Moral Education. The pupils also expressed their enjoyment of educational situations in which digital storytelling is used. There are some observations regarding digital storytelling production standards.

7.4 The fourth hypothesis test

To verify this hypothesis's validity, the researcher conducted a paired-samples T-test was used. This is shown in the following table:

Table 4: The value of pre/post motivation (t-test)

| Measurement | Test | No | Mean | S.D. | T | Sig. (2-tailed) |
|-------------|------------|----|-------|------|------|-----------------|
| Pre | Motivation | 20 | 15.66 | 2.54 | 8.81 | 0.0001 |
| Post | | 20 | 23.05 | 2.93 | | |

It is noticed from the previous table that the value of (t) reached (8.81) at the probability value (0.0001), which is less than the level of significance adopted in the research (0.05), and this indicates the validity of the hypothesis, due to the effectiveness of digital storytelling in developing the motivation of the learners, and the results of the study of Al-Amri (2019) agree with the results of the current research in raising the motivation of the learners, where the learners showed interaction they were evident with their peers in the activity of authoring and designing digital storytellers, and they were facing some challenges in verbal communication with the same peers, and the results of Setiyorini (2020) confirm that digital storytelling helps learners learn information of a complex nature, which requires presenting it in exciting and attractive ways, and his study results showed the growth of sample motivation to learn new vocabulary (before and after) using digital storytelling.

7.5 The test of the validity of the fifth hypothesis

To verify the validity of this hypothesis, the researcher used the independent-samples t-test, in which the differences were calculated between the mean scores of the experimental group children and the mean scores of the control group children on the

total score of the motivation scale in dimensional measurement as shown in the following table:

Table 5: The value of post motivation (t-test)

| Measurement | Test | No | Mean | S.D. | T | Sig. (2-tailed) |
|--------------|-------------|----|-------|------|-------|-----------------|
| Experimental | Achievement | 20 | 23.25 | 2.91 | 6.633 | 0.0001 |
| Control | | 20 | 17.15 | 2.99 | | |

It is noticed from the previous table that the value of (t) reached (6.633) at the probability value (0.0001), which is less than the level of significance adopted in the research (0.05), and this indicates the validity of the hypothesis, and this is what the researcher observed by comparing the interaction of the children of the two groups during the educational situation. Hence, the experimental group received what the control group did not share in interacting with the information and concepts presented to them because it was presented traditionally. The researcher also noted that most control group children were unable to relate knowledge and concepts to their lives' realities or the external environment. Very few children took the initiative to ask questions to the teacher. Al-Shehri (2018) study confirms this method's effectiveness in developing motivation among learners to benefit the experimental group in the teaching, as indicated by Yuksel-Arslan, Yi. Idirim, Robin (2016) on teachers' positive opinions about using this method to motivate children, enjoyably acquire knowledge and information, and have had a compelling influence in guiding their behavior.

8. Conclusion

In conclusion, the researcher confirms that the experimental group children were more active and dynamic during the educational situation and began to narrate situations from the reality of their lives related to the content presented. They seemed to have fun while watching the digital storytelling. They interacted with the teacher throughout the educational situation. Their results were positive on the motivation scale. Compared to the control group, the achievement test, as for the teacher who provided the educational content to the experimental group, expressed her positive impression in using digital storytelling to teach children this stage. She saw a positive reflection on the level of children. The development of their knowledge and motivation, and from the above, the researcher emphasizes using digital storytelling in teaching concepts in general and scientific concepts.

Conflicts of Interest

The author declares no conflicts of interest.

About the Author

Dr. Nader S. Shemy is an associate professor in instructional technology and online learning. He is working as the head of the education program in AOU, Oman. Previously,

the head of the instructional technology department in the faculty of education, Fayoum University, Egypt. And the supervisor in the National e-Learning Center (2008: 2013) NELC, Egypt. He is doing lots of activities in the e-learning field with other entities like the school of education in Edinburgh University, UK, The National Center for e-learning and distance learning, KSA, Ministry of Communications, Sudan, Education reform Program (ERP) USA, Education Support Program (ESP) the USA, the Egyptian e-Learning University, Egyptian Police Academy, and Egyptian Public Universities (EPU).

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