

# A Proposed Program for Postgraduates in Egypt to Acquire the Skills and Techniques for Producing Concept Cartoons for Kindergarten Children

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**Abstract**—The current study presents a proposed program for acquisition the skills and techniques needed to produce concept cartoon. The proposed program has been prepared for non-specialist students who have never used neither graphics nor animating software. It was presented to postgraduates in Faculty of Education for Early Childhood, Cairo University, during the spring term of the 2014-2015 academic year. The program works in three different aspects: Drawing and images editing, sound manipulation, and creating animation. In addition, the researchers have prepared a questionnaire for measuring the quality of the concept cartoons produced by the students. The questionnaire was used as a pre-test and post-test, and at the end of the study, a significant difference was determined in favour of post-test results.

**Keywords**—Cartoon, concept cartoon, kindergarten, animation.

## I. INTRODUCTION

CONCEPT cartoons are one of the tools which can be applied in the environment of problem-based learning. They are cartoon style drawings used to motivate question. Moreover, they are designed to induce discussion and create scientific thinking [1], [2]. In addition, concept cartoons can be used to excite students to learn and hold them attentive [3], [4]. In learning environment, concept cartoons are methods for drawing the students' attention. Furthermore, they help to solve daily life problems, and provide alternative ideas. [5]

At first, they were applied for adults and were drawn on posters for teaching science concepts [6]. Afterwards, researchers started to discuss the impact of cartoon on students. The structure of concept cartoon differs from normal cartoon, as it does not involve ridiculous or extreme elements.

Concept cartoons focus on science-specific questions through a dialogue among the characters [7]. In this dialogue, each individual provides a various opinion. One of the opinions presented in the discussion expresses a method of thinking which is true and other characters express methods of thinking which are not true, but considered by some students [8]. Furthermore, providing names for the characters would be better for the teacher and the student as well [9].

## II. METHOD

The program has been developed to be suitable for non-specialist students who has never dealt with neither graphics

nor animating software. The program was presented to 30 postgraduates in the Faculty of Education for Early Childhood, Cairo University, during the spring term of the 2014-2015 academic year. Each student developed a concept cartoon of one or more scenes, and each produced cartoon is from 30 to 50 seconds.

The program took 30 hours divided into ten meetings; each one is three hours and contains a theoretical session and a practical session. Each theoretical session takes an hour, and each practical session takes two hours.

The researchers have designed a questionnaire for experts to determine the skills needed to build concepts cartoons, and they have agreed about five main skills:

1. The Skill of creating the idea.
2. The Skill of producing the sounds and designing the characters.
3. The skill of creating the animation.
4. The skill of using the multimedia programs.
5. The skill of directing the scenes.

The program aims to improve these skills; it consists of two main modules: Drawing module, and sound and animation module. The drawing module includes drawing and colouring the characters and the backgrounds. The sound and animation unit involves recording and manipulating sounds using Adobe Audition; in addition, animating the characters of the scene using Adobe Director.

TABLE I  
LESSON 1: INTRODUCTION

Unit 1: Drawing	Lesson 1: Introduction
Goals:	
• Design the scenes of the concept cartoons.	
Objectives:	
• Cognitive objective: Recognise the importance of concept cartoons.	
• Psychomotor objective: Acquires the skill of designing scenes.	
• Affective objective: Respect manual labour.	
Sources:	
• Using references and pictures from the Internet.	
Content:	
• Explaining some examples of concept cartoon, and how to design them.	
Procedures:	
• Each student design one or more scenes.	
Strategy:	
• Discussion, practical application.	
Evaluation:	
• The students' designs are evaluated, and one of them was chosen.	

The first meeting, (Table I), is an introduction to concept cartoons, some examples of concept cartoon are provided to students. Each student draws the design one or more scenes.

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These designs are discussed and evaluated, one of them was chosen to be implemented.

The second meeting aimed to explain the tools Adobe Photoshop. The meeting helped students to deal with the components of Adobe Photoshop. The detail of this lesson is shown in Table II.

TABLE II  
LESSON 2: BASICS OF ADOBE PHOTOSHOP

Unit 1: Drawing	Lesson 2: Basics of Adobe Photoshop
Goals:	
<ul style="list-style-type: none"> <li>Realize the importance of the use of graphics software (Adobe Photoshop) in preparation and processing images.</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognise the tools of Adobe Photoshop software.</li> <li>Psychomotor objective: Acquires the skill of dealing with softwares.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using Adobe Photoshop references.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>Adobe Photoshop components.</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>Each student draws four drawings using Adobe Photoshop software.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussion, practical explanation using computer.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>Pre-test and post-test evaluation.</li> </ul>	

The third and the fourth meetings involved drawing cartoon characters and backgrounds. It aimed to show the linear values of drawings, and determine and draw the background and the characters of concept cartoons. Moreover, it helped students to acquire the skill of drawing with pencil. Some students did not give a good response, they could not produce the expected performance; therefore, they used pictures directly from the internet. Tables III and IV demonstrate the details of the third and the fourth lessons respectively.

TABLE III  
LESSON 3: DRAWING THE BACKGROUND

Unit 1: Drawing	Lesson 3: Drawing the scenes
Goals:	
<ul style="list-style-type: none"> <li>Realise the linear values for the background scenes.</li> <li>Realise the detail of the visual decoration in the background.</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognize the meaning of the background components.</li> <li>Psychomotor objective: Acquire the skills of drawing and building backgrounds.</li> <li>Affective objective: Respect working with others and appreciate teamworks.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using background and scenes from the internet.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>The meaning of digital images and pixel - how to convert hand drawn images to digital - drawing backgrounds.</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>The researchers demonstrate the steps of drawing the scenes.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussion, practical explanation using computer.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>Pre-test and post-test evaluation is used before and after drawing the background.</li> </ul>	

Afterwards, the fifth meeting, (Table V), focused on manipulating images using Adobe Photoshop. It was the first step to produce a scene. It helped students colour and prepare their backgrounds and characters. Some students could draw

simple drawings; then, they scanned them to computer. Others downloaded pictures from the internet, and manipulate them using Adobe Photoshop to produce the scenes.

TABLE IV  
LESSON 4: DRAWING THE CHARACTERS

Unit 1: Drawing	Lesson 4: Drawing cartoon characters
Goals:	
<ul style="list-style-type: none"> <li>Realise the linear values of drawings</li> <li>Determine and draw the main character of concept cartoons.</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognise the types of characters.</li> <li>Psychomotor objective: Acquires the skill of drawing with pencil.</li> <li>Affective objective: Respect manual labour.</li> <li>Entertainment objective: Feel the value of characters for children and unite with the selected character.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using references and pictures from the Internet.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>Explaining how to draw with pencil and how to make an exaggeration to an organ of the body, such as the eye or the nose.</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>Each student draws four drawings with pencil to select the best.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussion, practical application and continuous training.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>The students' drawings are evaluated by making an exhibition to criticise and choose the best.</li> </ul>	

TABLE V  
LESSON 5: MANIPULATING IMAGES

Unit 1: Drawing	Lesson 5: Manipulating images in Adobe Photoshop
Goals:	
<ul style="list-style-type: none"> <li>Realise the colour values in the scenes.</li> <li>Realise manipulating images using Adobe Photoshop.</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognize the tools of adding some effects on images.</li> <li>Psychomotor objective: Acquire the skills of colouring, and menu images.</li> <li>Affective objective: Respect working with others and appreciate the teamwork.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using background and scenes from the internet.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>Image processing using computer – colouring backgrounds.</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>The researchers demonstrate the steps of drawing the scenes.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussion, practical explanation using computer.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>Pre-test and post-test evaluation is used before and after drawing the background.</li> </ul>	

The sixth meeting involved the basics of Adobe Director. Through that lesson, students recognised the windows and components of Adobe Director. The researchers used some tutorials from the internet beside practical explanation. The detail of this lesson is presented in Table VI. Thereafter, during the seventh meeting, the students understood the properties of images in Adobe Director, and how to change positions, dimensions, and angles of Images. Some projects were presented to them, and each student developed similar ones. The researchers evaluated the produced projects and how students treated the images. Table VII demonstrates the detail of this lesson.

TABLE VI  
LESSON 6: BASICS OF ADOBE DIRECTOR

Unit 2: Sound and Animation	Lesson 6: Basics of Adobe Director
Goals:	
<ul style="list-style-type: none"> <li>Recognise the elements of multimedia software (Adobe Director).</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognise the windows and components of the Adobe Director software.</li> <li>Psychomotor objective: Acquire the skills of using the windows of the Adobe Director software.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using Adobe Director references - tutorials from the internet.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>Menus and windows of Adobe Director, and the importance of each window.</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>Each student develops a simple project, and use the components of Adobe Director.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussion, practical explanation using computer.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>The researchers evaluate the first project and how students understand and use the components of the software.</li> </ul>	

TABLE VII  
LESSON 7: PROPERTIES OF IMAGES

Unit 2: Sound and Animation	Lesson 7: Properties of images
Goals:	
<ul style="list-style-type: none"> <li>Recognise how to control and change the properties of images.</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognise the properties of images in Adobe Director, and how to change the position, the dimension, and the rotation angle of images</li> <li>Psychomotor objective: Acquire the skills of manipulating images using its properties.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using Adobe Director references - tutorials from the internet.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>Explaining the properties inspector window, and study each property.</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>Some projects are presented, and each student tries to develop similar ones.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussing some examples - practical explanation using computer.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>The researchers evaluate the produced projects and how students manipulate images.</li> </ul>	

TABLE VIII  
LESSON 8: ANIMATION IN ADOBE DIRECTOR

Unit 2: Sound and Animation	Lesson 8: Animation in Adobe Director
Goals:	
<ul style="list-style-type: none"> <li>Recognise the methods of animating images.</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognise how to animate images using Adobe Director.</li> <li>Psychomotor objective: Acquire the skills of animating images.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using Adobe Director references – examples of animated scenes.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>Explaining the methods of animating images – discussing some examples..</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>Each student animates some images according to the presented examples.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussion the examples - practical explanation using computer.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>The researchers evaluate the produced animation.</li> </ul>	

The eighth meeting, (Table VIII), explained the methods of animating; moreover, the researchers discussed some examples of animated scenes. Afterwards, students animated the images of their scenes according to the presented

examples.

TABLE IX  
LESSON 9: MANIPULATING SOUND

Unit 2: Sound and Animation	Lesson 9: Manipulating sound
Goals:	
<ul style="list-style-type: none"> <li>Recognise how to use Adobe Audition software.</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognise the techniques of recording and manipulating sound using Adobe Audition software.</li> <li>Psychomotor objective: Acquire the skills of treating the sound files.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using Adobe Audition references - tutorials from the internet.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>Explaining the components of Adobe Audition software, and how to record and manipulate sounds.</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>Each student makes a recoding for a scene and tries to improve its quality.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussion, practical explanation using computer.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>The researchers evaluate the quality of the produced sound.</li> </ul>	

TABLE X  
LESSON 10: PRODUCING A COMPLETE SCENE

Unit 2: Sound and Animation	Lesson 10: Producing a complete scene
Goals:	
<ul style="list-style-type: none"> <li>Recognise how to produce a complete movie includes images, sounds, and animation.</li> </ul>	
Objectives:	
<ul style="list-style-type: none"> <li>Cognitive objective: Recognise how to prepare a complete movie.</li> <li>Psychomotor objective: Acquire the skills of design a complete scenes.</li> </ul>	
Sources:	
<ul style="list-style-type: none"> <li>Using Adobe Director references – examples of animated scenes with sound.</li> </ul>	
Content:	
<ul style="list-style-type: none"> <li>Explaining the how to adjust the sound and animation together to produce a movie – discussing some examples.</li> </ul>	
Procedures:	
<ul style="list-style-type: none"> <li>Each student develops a complete movie of Adobe Director.</li> </ul>	
Strategy:	
<ul style="list-style-type: none"> <li>Discussion, practical explanation using computer.</li> </ul>	
Evaluation:	
<ul style="list-style-type: none"> <li>The researchers evaluate the quality of produced movie.</li> </ul>	

The sound issue was discussed in the ninth meeting. The Adobe Audition software was used to explain the techniques of recording and manipulating the sound files. Students recorded the voices required for their scene; moreover, they tried to improve its quality using the tools of this software. More about this lesson is in Table IX.

Finally, the last lesson, (Table X), focused on producing a complete movie includes images, sounds, and animation. Students adjusted the sound with the animation.

After applying the program, the researchers have designed a questionnaire for measuring the quality of the produced concept cartoons. It involves four main skills: Drawing and colouring, manipulating sound, animation, and producing the concepts cartoon. The final form of this questionnaire is shown in Table XI after the opinions of the reviewers.

TABLE XI  
QUESTIONNAIRE FOR EVALUATING STUDENTS' PERFORMANCE

Sub skills	Main skills
1 Drawing the background	Drawing and colouring
2 Drawing the characters	
3 Drawing the animation of the images	
4 Colouring the background	
5 Colouring the characters	Manipulating sound
6 Quality of the characters' voices	
7 Quality of the background music	
8 Smooth of the animating images	Animation
9 Using the keyframe animation	
10 Relevance between the cartoon and the concept.	Producing the concepts cartoon
11 Synchronization between the animation and the sound	
12 Merging the characters with the background	

TABLE XII  
THE RESULT OF APPLYING THE PROGRAM

Item	The percentage		
	Before applying	After applying	The difference
1 Drawing the background	30	45	15
2 Drawing the characters	22	34	12
3 Drawing the animation of the images	4	24	20
4 Colouring the background	56	89	33
5 Colouring the characters	56	89	33
6 Quality of the characters' voices	61	95	34
7 Quality of the background music	58	95	37
8 Smooth of the animating images	3	23	20
9 Using the keyframe animation	0	95	95
10 Relevance between the cartoon and the concept.	82	91	9
11 Synchronization between the animation and the sound	12	94	82
12 Merging the characters with the background	17	51	34

III. RESULTS AND DISCUSSION

The researchers have introduced the program to a group of 30 students. Pre-test and post-test, and a quasi-experimental design without a control group were utilised in the study. Table XI represents the questionnaire which was used for the pre-test and post-test. The tests' scores showed a significant difference in favour of post-test scores. Table XII and Fig. 1 show a comparison between the result before and after applying the program.

Table XIII and Fig. 2 show a comparison between the overall result of each main skill before and after applying the program.

TABLE XIII  
THE OVERALL QUESTIONNAIRE RESULT

Item	The percentage		
	Before applying	After applying	The difference
1 Drawing and colouring	33.6	56.2	22.6
2 Manipulating sound	59.5	95	35.5
3 Animation	1.5	59	57.5
4 Producing the concepts cartoon	37	78.7	41.7

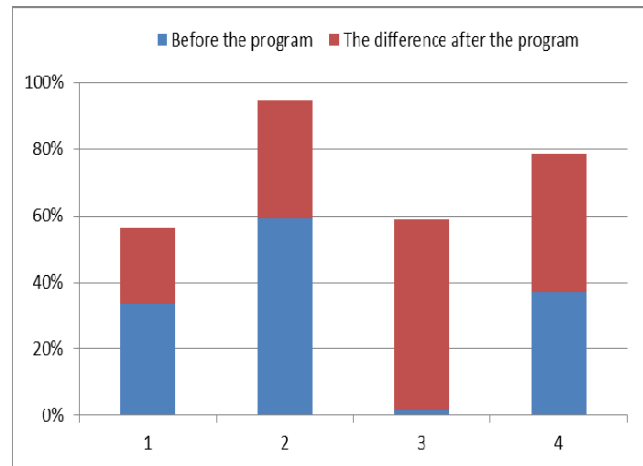


Fig. 2 The overall result of applying the program

It is obvious that skills which do not need a talent, such as using keyframe in animation and manipulating sound, increased sharply, because these parts is done by fixed steps using computer. On the other hand, the skills which need a talent, such as drawing images and drawing the frames of animation, increased slightly.

REFERENCES

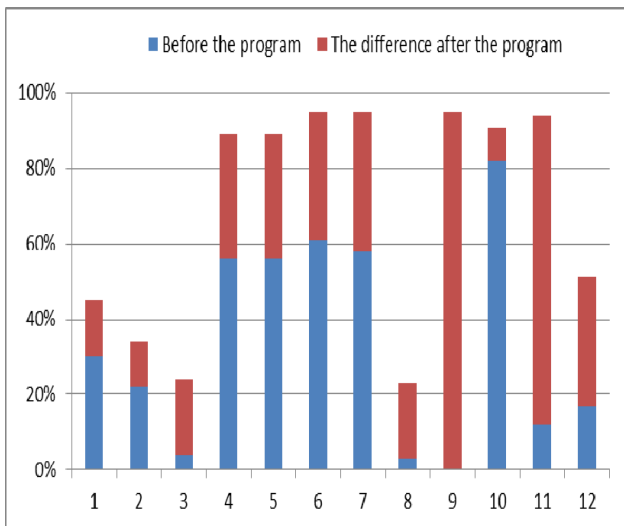
[1] Kaptan, F. & İzgi, Ü. (2014). The effect of use concept cartoons attitudes of first grade elementary students towards science and technology course. *Procedia-Social and Behavioral Sciences*, 116, pp.2307-2311.

[2] Long, S., & Marson, K. (2003). Concept cartoons. *Hands on Science*, 19 (3), 22-24.

[3] İnel, D., & Balım, A.G. (2013). Concept cartoons assisted problem based learning method in science and technology teaching and students' views. *Procedia-Social and Behavioral Sciences*, 93, pp.376-380.

[4] Huang, T. H., Liu, Y. C., Lin, T. Y. & Istanda, V. (2006). Construction of integrating of concept cartoons into two-tier on-line testing system.

Fig. 1 The result of applying the program



International Association for Development of the Information Society (IADIS) International Conference. Murcia, Spain (5-8 October 2006)

- [5] Cengizhan, S. (2011). Prospective teachers' opinion about concept cartoons intergrated with modular instructional design. *Education and Science*,36(160), 93-104
- [6] Keogh, B. & Naylor, S. (1999). Science goes underground. *Adults Learning*, 10(5), 3-6.
- [7] Naylor, S., Keogh, B. & Downing, B. (2007). Argumentation and primary science. *Research in Science Education*,37(1), 17-39.
- [8] Akamca, Özyılmaz G., & Hamurcu, H. (2009). Anthologies, concept cartoonsand science and technology education supported by prediction-observation-explanation techniques. *E-journal of New World Sciences Academy*,volume: 4, number: 4,article number: 1C0089
- [9] Kabapınar, F. (2005). Effectiveness of teaching via concept cartoons from the point of view of constructivist approach. *Journal on Educational Sciences in Theory and Practice*.5(1).135- 146.