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The effect of different interaction levels on instructional design learners

Magdy Aqel*

Palestine, Gaza, Islamic Univesrsity o f Gaza

Abstract

The study examines the effect of different interaction levels on instructional design learners, the instrument of this research was a Assessment sheet to collect data about students' instructional design course, The sample consisted of (26) males and (21) females from master program students at the Islamic university of Gaza- faculty of education, the web environment of this study based on different interaction types such as learner to (learner, teacher, content and interface), the web environment also used different interaction levels (passive interaction, limited interaction, complex interaction and real time interaction). The findings from this study showed that there was a statistical difference at($\alpha \leq 0.05$) between instructional design skills before and after the study in favor to using different interaction levels after the study, also there no statistical difference at($\alpha \leq 0.05$) between males and females in instructional design skills after the study

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Key words: Instructional design, interactive levels, web environment.

1. Introduction

Interaction in a traditional classroom is much different than the interaction that occurs in a Web-based course (Thurmond & Wambach, 2004), This difference due to the environment of the web, it consist of much stimulus and response.

Gilbert and Moore (1998) note that an accepted definition of interactivity in the literature on computer-mediated instruction is a reciprocal exchange between the technology and the learner, a process which he says is referred to as "feedback." Gilbert and Moore use the terms "interaction" and interactivity" interchangeably, Wagner (1994, 1997) draws a sharp distinction between them. Like Gilbert and Moore, she says that "interaction" is an interplay and exchange in which individuals and groups influence each other Roblyer & Ekhaml(2004),

* Corresponding author. Tel.: +970-59-9994713.

E-mail address: msaqel@iugaza.edu.ps

Chickering & Gamson (1987) also define The concept of interaction as a core element of the seven principles of good practice in education.

2. Literature review

2.1. Types of interaction

This research used four types of web-based interaction (learner-teacher, learner-learner, learner-content and learner-interface), see fig.1, these types of interaction are used the most by previous studies (Moore & Kearsley, 1996; Swan, 2001; Leasure et al., 2000; Palloff & Pratt, 2001; Chen, 2002; Ehrlich, 2002)

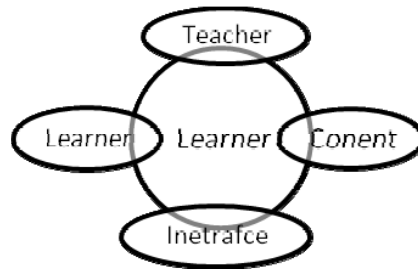


Fig. 1. Types of interaction

2.2. levels of Interaction

"The Levels of Interactivity as defined by the Department of Defense (DoD) provide a basis for developing effective and interactive eLearning in accordance with your corporate and training objectives". (Carter & Lange, 2005).

Carter & Lange(2005) also classified the interaction into Four levels:

Level I: Passive

The interaction in this level is so simple, The learner acts solely as a receiver of information. The learner is required to read the text on the screen, view graphics, illustrations, charts, and use the navigational buttons to progress forward through the program or move back.

Level II: Limited Interaction

The learner makes simple responses to instructional stimulus, The eLearning includes learning activities that listed in Level I as well as scenario-based multiple choice and column matching related to the text and graphic presentation.

Level III: Complex Interaction

The learner makes a variety of responses using varied techniques in response to instructional stimulus, The responses include those listed for a Level II as well as text entry boxes and manipulation of graphic objects to test assessment of the information presented.

Level IV: Real-time Interaction

The learner is directly involved in a life-like set of complex responses.This involves engaging the learner in a simulation that mirrors the work situation with stimuli-and-response coordinated to the actual environment.

This research used all of previous levels in learning the student how to start there instructional design, see fig.2-6, web-based environment was built using all the previous levels, students used very simple interaction(Passive) as button navigations, also the students used the others levels such as answering question(Limited Interaction), Write sentences(Complex Interaction) and work in simulation screen(Real-time Interaction) to design an activity.

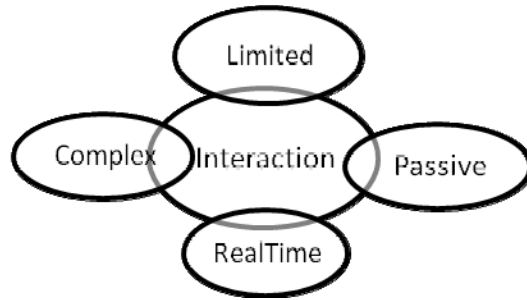


Fig. 2. Interaction levels



Fig. 3. Passive Interaction level(hyperlink navigation)

English Name	Grade	Comment	Last modified (Student)	Last modified (Teacher)
غير رينه	No grade		pptx Tuesday, 16 April 2013, 11:09 AM	
ايه بسام	No grade			
التهماء كة	No grade			
الاء	No grade			
الاء مة	No grade			
الاء نيل عبد	No grade			

Fig. 4. Limited Interaction level(explore the content)



Fig. 5. Complex Interaction level(internal email)

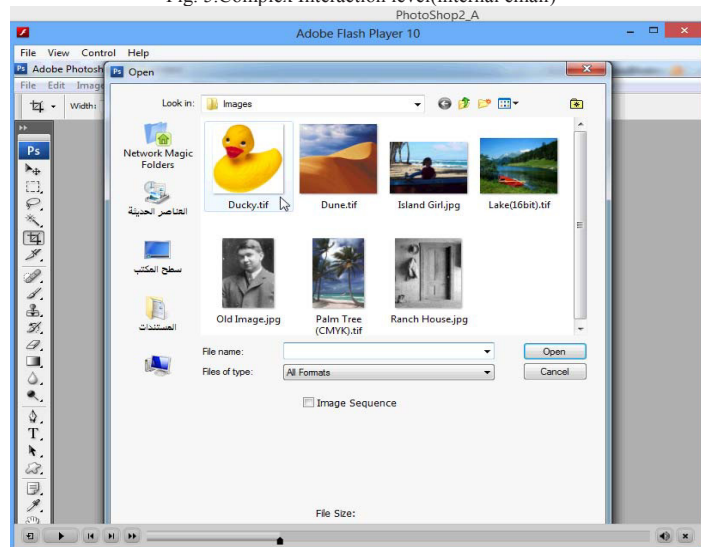


Fig. 6. Real-time Interaction level(Using simulation)

2.3. Instructional Design

Effective teaching begins with effective planning, Instructional design provides a systematic process for planning instructional events based on a systematic process of applying principles of learning and instruction to plans for instructional systems (Gagné & Driscoll, 1988; Gagné, Wager, Golas, & Keller, 2005), instructional designers and developers use principles of learning and instruction to inform their instructional design practices (Seels & Glasgow, 1998).

In this research, students tried to build their suitable instructional design by themselves, that is like shifting instructional design principles and practices from objectivism to constructivism (Bonk & Cunningham, 1998; Cooney, 1998; Jonassen, 1992).

In this research, The researcher developed web-based environment with different interaction levels, see fig7, learning course management system(Moodle) was used in this research that is already available at the Islamic university of Gaza(IUG), also the students learned many instructional design software such as (MS PowerPoint, Adobe Photoshop, Adobe Audition, Windows moviemaker and adobe Captivate), as shown in figure6, all interactive levels mixed in the web-based environment.

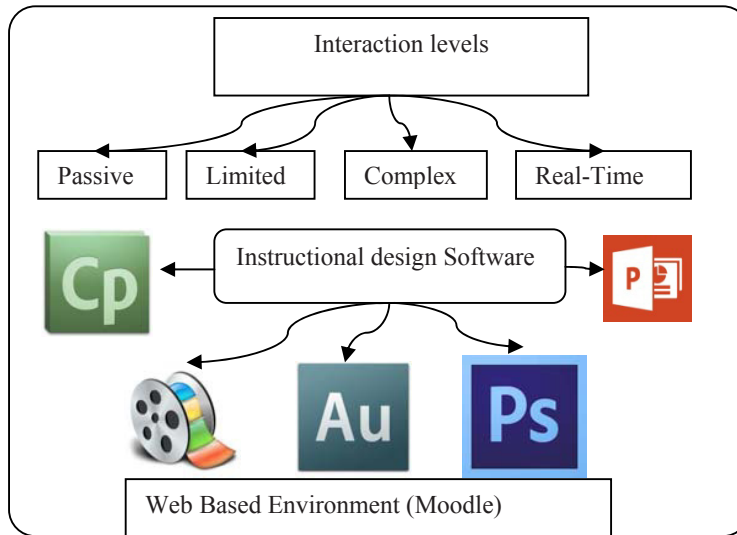


Fig. 7. Instructional design environment

3. The Aim of Research

The aim of this research is to examine The effect of different interaction levels on instructional design learners, This study seeks to answer the following research questions:

- What are the interaction levels that need to learn the master student how to design their instructional program?
- is there any statistical difference at($\alpha \leq 0.05$) between instructional design skills before and after the study?
- is there any statistical difference at($\alpha \leq 0.05$) between males and females in instructional design skills after the study?

4. Scope and Limitations

the sample of this study consisted of (26) male students and (21) Female student from the master program at the faculty of education level(1), the sample included all that students at level(1) in the term (2012-2013), Four interaction levels were used in this study(passive, limited, complex and real time).

5. Instruments

The research develop an Assessment sheet to measure the difference in students skills before and after the study (appendix A), the Assessment sheet consisted of (7) main domain and (30) sub domain, The instrument has a Cronbach alpha reliability score of (0.82).

The content of the instrument was validated by three methodology teachers and five instructional technology teachers with more than 10 years working experience.

6. Results

To answer the first question of this research which titled " What are the interaction levels that need to learn the master student how to design their instructional program?", the researcher used four levels of interaction (passive, limited, complex and real-time) that classified by Carter & Lange(2005).

The second question of this research titled as "Is there any statistical difference at($\alpha \leq 0.05$) between instructional design skills before and after the study?", the researcher used t-test to determine if there were significant differences between the groups in the instructional design skills. Table 1 and Table 2 shows the results of t-test comparison of pre/post test skills for (males).

Table 1. t-Test comparison of pre/posttest instructional design skills for males

Group	N	Mean	SD	t-value	<i>p</i>	Effect size
Pre Test	26	7.78	5.33	58.9	< .05	0.9
Post Test	26	84.28	4.51			

Table 1 shows that there is a significant difference between pre-test (mean = 7.78, SD=5.33) and post-test (mean = 84.28, SD=4.51) marks, $t(25) = 58.9, p < .05$. The mean scores indicate that post-test have significant higher achievement towards the interaction levels than pre-test.

Table 2. t-Test comparison of pre/posttest instructional design skills for Females

Group	N	Mean	SD	t-value	<i>p</i>	Effect size
Pre Test	21	7.71	4.95	75.02	< .05	0.9
Post Test	21	84.648	3.66			

Table 2 shows that there is a significant difference between pre-test (mean = 7.71, SD=4.95) and post-test (mean = 84.64, SD=3.66) marks, $t(20) = 75.02, p < .05$. The mean scores indicate that post-test have significant higher achievement towards the interaction levels than pre-test.

The Third question of this research titled as" is there any statistical difference at($\alpha \leq 0.05$) between males and females in instructional design skills after the study?", the researcher used t-test to determine if there were significant differences between the males and females in the instructional design skills. Table 3 shows the results of t-test comparison of males/females after the study.

Table 3: t-Test comparison of males/females instructional design skills after the study.

Group	N	Mean	SD	t-value	<i>p</i>
males	26	84.28	4.51	0.29	> .05
females	21	84.64	3.66		

Table 3 shows that there is no a significant difference between males (mean = 84.28, SD=4.51) and females (mean = 84.64, SD=3.66) marks, $t(45) = 0.29, p > .05$. The mean scores indicate that males have not significant higher achievement towards the interactive levels than females.

7. CONCLUSIONS

This study aimed at investigating how different interaction levels affects students' skills in instructional design, four interaction level(passive, limited, complex and real-time) were used at web based environment(Moodle).

Assessment sheet was developed to collect data about students' instructional design, From the results of this research, using interaction levels was very effective table(1,2), also males have not significant higher achievement towards the interaction levels than females.

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Appendix A. Assessment sheet

Instructional design Skills	Weak	Good	Excellent
A-Analysis in instructional design model.			
1. Use exact instructional model.			
2. Follow the instructional model steps.			
3. Write the learning objectives in details.			
4. Using suitable evaluation.			
5. Detect the learning content.			
6. Design content scenario.			
B- Learning Resources.			
7. Collect the needed learning object from the web.			
8. Design the suitable learning object.			
9. The learning resources suitable for learning objectives			
10. Use learning object in high quality.			
C- Texts in instructional design.			
11. Use the font color with suitable background			
12. Highlight the main object learning			
13. Use suitable font size			
14. Use suitable font style			
D- Images in instructional design (Using Adobe Photoshop).			
15. Add a suitable filter for the used image.			
16. Use high quality image.			
17. The image relate to leaning object.			
18. Merge one more image file.			
E- Sound in instructional design (Using Adobe Audition).			
19. Add a suitable filter for the used sound .			
20. Use high quality sound.			
21. The sound relate to leaning object.			
22. Merge one more sound file.			
F-Implementation in instructional design(MS PowerPoint).			
23. Build his/her master slide.			
24. Use button navigation.			

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25. Use specific motion.
 26. Detect interactions navigation.
 27. Use mouse effects.

G- Evaluation in instructional design.

28. Use suitable evaluation after each learning objective
 29. Validate the instructional design by the experts
 30. Build the suitable feedback according to student results
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