CONSIDERATIONS FOR DESIGNING INFORMATION TECHNOLOGY TRAINING TO LEBANESE PUBLIC SCHOOL PRINCIPALS

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Abstract

This paper focuses on an investigation into the role of information technology in the lives of Lebanese school principles. The objective of this research is to identify Lebanese school principles' perceptions of the barriers, benefits and negative consequences of information technology usage by listening to their views and experiences. Findings of this research indicate that Lebanese school principles faced challenges including psychological and physical barriers to technology usage. This research can serve as a basis for enabling to make an informed decision about designing future information technology training sessions that can accommodate and serve the Lebanese school principles' specific needs.

Keywords:
Digital Immigrants, Lebanese University, Middle-aged Adults, Technology Training, Usage Barriers, Lebanese's school principles

Considerations for Designing Information Technology Training to Lebanese Public School Principals

1. Introduction

Technology literacy is a crucial for success in the 21st century. Technology skills are frequently used to perform academic, career, and own everyday jobs more effectively and efficiently as compared to completing them in traditional methods (Bean & Laven, 2003). During the time in which information technology has become a major tool used by people all over the world, there has also appear a progressive growing gap between generations. In particular, the distance gap between students' technology usages and the school principles technology usages in Lebanon. The vast majority of the Lebanese's school principals are digital immigrants; they have not had the chance to become skilled at the use of information technology during their younger years. 'Digital immigrants, grouped as those who were born before 1980, did not grow up with technology supporting daily tasks, as much as younger generation, or the digital natives, have been able to experience', (Prensky, 2001). Given that information technology are typically seemed a tools for younger generation, they can stumble upon inconvenience utilizing facilities services for information technology As the Lebanese's school principles attempt to put an effort to become a part of the technologically-savvy generation, many face challenge to succeed. The causes involve the heavy time and effort demands needed to learn the technologically development, furthermore to their decline in functions capacity, and diffidence to equipment and resources (Selwyn, Gorard, & Furlong, 2003).

2. Underlying Principle of the Research

The researcher taught in the 2013 information technology training sessions project that targeted Lebanese school principles. During the information technology training sessions, the researcher observed many barriers and difficulties that hindered students learning. In the process of teaching information technology skills to Lebanese school principles, there are specific needs that must be considered for them in order to promote successful learning of new skills and tasks. The objective of the research is to

investigate Lebanese school principles' perceptions of the barriers and their experiences on technology usage. Such research is needed to understand the difficulties, including the positives and negatives experienced of Lebanese school principles learning and using information technology. This research can serve as a basis for enabling to make an informed decision about designing future information technology training sessions that cam serve the Lebanese's school principles specific needs.

3.   The 2013 Information Technology Training Sessions Project

The project was carried out from March 15 till June 7, 2013; and it was consisted of a series of teaching sessions targeted Lebanese public school principles. Teaching Basic information technology skills, Operating Systems and software, Microsoft Office (Excel, Word, PowerPoint), Internet and e-mail skills, and ActivInspire software. The lessons toke place in the Lebanese university - Faculty of Pedagogy- information technology labs, giving the "students" the opportunity to learn by performing the tasks themselves. The series of teaching sessions were sequential; each session was building on lessons learned in previous sessions. The sessions had multimedia components, including a combination of screen illustrations that were easy-to-follow and hands-on practice. Videos were also included to further illustrate the concepts. A booklet was specially written by the Lebanese university was employed to be of assistance to Lebanese public school principles attaining the technology skills. The booklet was sent home with students for further reference and increased retention. The content of the sessions included the following topics:

Basic Information Technology Skills:
- Anatomy of a Information technology
- How Information technology Work
- Turning the Information technology On and Logging On
- The Desktop
- Keyboard Commands
- Adjust the screen
- The Mouse-Left-Clicking, Double-Clicking, and Right-Clicking

Operating Systems and Software
- The Operating System
- The Start Menu
- Managing Windows
- Logging Off vs. Shutting Down
- frequently used acronyms
- Access files,
- saving/finding files on the information technology

Microsoft Word
- Opening an Existing Document
- Starting a New Document
- Fonts Formatting and Alignment
- Cut, Copy and Paste
- Bulleted and Numbered Lists
- Insert tables and Illustrations
- Page background and layout
- Correcting Spelling and Grammar
- Saving Work and Closing a Document

Microsoft Excel

- Excel Basics
- Entering Data and Navigating in a Worksheet
- Saving a Workbook & Re-opening a saved workbook
- Formatting a Worksheet
- Managing workbooks
- Editing a Workbook
- Basic Calculation and Formulas
- Creating & Working with Charts

Microsoft PowerPoint

- PowerPoint Basics
- Creating and Editing a Presentation
- Working with Objects
- Working with Views
- Working with Charts
- Slide Management
- Displaying a Slide Show
- Saving Presentations

Internet Basics

- Internet browser
- how to get to a website
- major buttons on browser
- using bookmarks
- Searching on the net
- Security online

Email

- Email addresses
- Send/receive email
- Use attachments
- Sign up for free email
- Manage email

Advanced Topics

- Blogs: what are they, how do they work, how would I or my family use one to stay in touch?)
- Social networking? (MySpace, Facebook)
- Sky drive

4.   Research Study
4.1.   Research Questions

The objective of this research was to determine the Lebanese school principles' perceptions of the barriers and their experiences of technology usages. In this research study, the following research questions were addressed:

1. What are the self reported school principles' perceptions on the factors that inhibit them from realizing technology skills?
2. What are some of the recommendation towards enhancing information technology training sessions?

3. What are some of the recommendation towards increasing information technology usage among Lebanese's school principles?

4.2. Research Mythology

This study explores the Lebanese school principles' perceptions of the barriers, benefits and negative consequences of the technology usage and their experiences. This effort led to an understanding that can guide governments, professionals and educators to evaluate, modify, and develop future training sessions to public school principals on the use of information technology. The study used two sources of evidence; survey instruments and interviews.

4.3. Survey Instrument

The survey instrument used in this study was a paper and pencil form questionnaire administered in Arabic language. Survey items were developed based on an extensive literature review as well as querying participants using an exploratory questionnaire. See table I. Participants completed a 15 minute survey. Data from the Survey were separated into 'yes', 'no', or 'not sure' categories. The results of the data were evaluated and analyzed using SPSS software.

Table I. Survey Questions.	
Issue	Question
Experience	• When did you first start to use the information technology? • How experienced would you say you were at using the information technology (Technology)? • What do you use the technology for (both regularly and occasionally)?
Training	• How did you first learn to use the information technology?
Perceived use	• Do you find the technology useful in your work/leisure activities? • Do you find technology useful when keeping in touch with friends/relatives/work?
Perceived ease of use	• Do you find the technology easy to use? • Do you enjoy using the technology? • Are you willing to try new technology functions? • Do you have any concerns about using the technology (security or ability)?
Efficacy	• Do you worry about making mistakes? • Do you feel able to competently use the technology? • Do you find the technology gets easier to use the more you use it?
Perceived complexity	• Do you have any problems when using technology? • Do you find the error messages helpful when you make a mistake? • Do you find it easy to get help when you are having problems using technology?
Health	

Perceived Younger Environment General	• Do you have any health problems that make it harder for you to use the technology, i.e. pain in limbs, arthritic hands, difficulty sitting for long periods of time, eyes that tire easily? • Do you find it easy to read information on the computer screen; do your eyes get tired easily when using technology? • Do you find it difficult to concentrate for long periods of time? • Do you access the technology in a place other than your home/work (i.e. library or Internet cafe´)? If so, how comfortable do you feel in that environment? • What your highest educational qualification is? • What technology or software you use most frequently? • Are there any comment or points you would like to raise that you feel haven't been covered in this survey?

4.4. Non-Directive Interviews

The researcher conducted one-to-one non-directive interviews, the questions were not pre-planned. The interviewer listened and did not take the lead. The interviewer follows what the interviewee has to say. The interviewee leads the conversation. The interviewer has the objectives of the research in mind and what issues to cover during the interview. The participant was allowed to talk freely about the subject and their views. In addition, the interviewees were able to discuss their perception and interpretation in regards to a given situation, and reword the responses to confirm the accuracy of the interpretation. This study was conducted in a manner that protected the confidentiality of the participants. All the schools principles were treated as a single group.

5. Data Collection and Analysis

Survey implementation and Non-directive Interviews were conducted were conducted during June 2013. Participants were randomly solicited during lunch hour. The Participants were given the opportunity to be involved in the study; the Participants who decided to participate were acknowledged that this study was voluntary and that it was understood that all information would remain confidential. Each volunteer was given the one page survey to be completed. 50 survey questionnaires were collected. The data collected were entered in the SPSS software, for further analysis.

6. Data Results

6.1. Data Results Components

A principal component analysis was conducted and four distinct components emerged:
Component 1: Technical background
Component 2: Psychological barriers to technology usage includes
   1. Perceived usefulness
   2. Perceived ease of use
   3. Perceived complexity of technology terms
Component 3: Physical barriers to technology usage includes
   1. Changes in perceptual senses- Vision,

2. Motor functions- arthritic hands, back pain
3. Cognitive capabilities that develop with age

Component 4: Other barriers

The principal component analysis was used to set up the matrix to answer the research questions.

6.2. Data Analysis

Data from the Survey and the interviews were separated into 'yes', 'no', or 'not sure' categories. The results of the data were evaluated and analyzed using SPSS software. Because of the exploratory nature of this research, a number of different types of analyses were conducted. Descriptive statistics, such as frequency counts and percentages, were used to summarize the data from research questions. The data from the Survey and the interviews were applied to generate contingency tables. The contingency analysis offered an evaluation of the sets of nominal data and also acted as the basis for the statistical tests of association. We are dealing with non-parametric data, it control two variables, age & experience, chi-square tests were used to evaluate the significance of the data (with a significance level p50.05). However, they do not guarantee magnitude or direction of effect, as this involves qualitative, as well as quantitative.

6.3. Sample Group

The study participants comprised 50 Public school principals ranging in age from 48 to 62 years, (see Table II).

6.4. **Component**

1. **Technical background** lists the participants' background:

Table III

technical

Table II. Profile of the subjects	
Profile of the subjects	Percentage distribution
Gender	
Female	54
Male	46
Age	
45 – 54	30
55 – 65	70

Table III. Profile of the subjects	
Profile of the subjects	Percentage distribution
Information technology experience	
New user	47
Experienced user	53
Information technology usage	
Little	44
Often	56

6.5. Component 2: Psychological barriers to technology usage includes
6.5.1. Perceived Usefulness
a. Information technology usage:

The chi-square factor denoted significant positive effect, greater than 0.05, of perceived usefulness of the information technology usage ($p = 0.067$, $p > 0.05$). The majority of participants, who perceived the information technology as useful, have the tendency to use technology more than the participants with a negative perception. The following quotes are illustrative examples behind this effect:

- Participants with positive perceived usefulness and high usage: 'use the technology to keep up with family and especially their young relatives', 'Look for information', 'Remain active', & 'Discover for pleasure'.
- Participants with negative perceived usefulness and low usage: 'The information technology is mystery', 'I find information technology overwhelming and confusing'.

b.   Information Technology Experience:
The chi-square test showed that technology experience affected perceived usefulness of information technology. The results show that most of the participant, whether new or experienced information technology users, perceived the information technology (87%) as useful. Although the chi-square result shows a significant effect ($p = 0.026$, $p < 0.05$), it do not agree with the study hypothesized, i.e. that new users will have a negative perceived usefulness and that experienced users will have a positive perceived usefulness. Instead, it shows significance in the direction, that most of the participants perceive the information technology as useful. Experience, therefore, does not have an effect on perceived usefulness directly. The following quotes highlight the positive perception of usefulness:

- Participants who are new technology user with positive perceived use: 'Started to use the technology as so much was becoming important'.
- Participants who are experienced users with positive perceived use: I can't live without Technology'; 'I incorporate technology into my daily life'.

6.5.2. Perceived Ease of Use
a.   Information technology usage:
The chi-square test demonstrate that significant effect was the perceived ease of use of technology on technology usage ($p = 0.039$, $p < 0.05$). The following quotes demonstrate this effect:

- Participant does not perceive technology as easy to use, so uses it little: 'I only use the information technology with the assistance of other people'.
- Participant perceives the technology as easy to use, so uses it often: 'I find it easy to use and enjoy it'.

b.   Information Technology Experience:
The chi-square tests showed that there was a significant ($p= 0.005$, $P < 0.05$) positive effect of information technology experience on perceived ease of use of the technology. New technology users were equally negative and positive about perceived ease of use of technology. The following quotes demonstrate this effect:

- Participant who are new technology user and has a negative perceived ease of use of the technology: 'I don't have the time. I find it frustrating and prefer traditional methods'.
- Participants who are experienced users with positive perceived ease of use of the Internet: 'I think the more you use it, the more you learn'.

6.5.3. Perceived Complexity of Technology Terms
a.   Information Technology Usage:
There was no stability in the chi-square analyze; the contingency results demonstrate that Participant who perceived complexity of technology terms does not influence their technology usage. It made no difference in the positive group as to how repeatedly they used technology. Those that did not find it complex (negative perceived complexity of technology terms) used technology often (69%), but even in those that did find it complex (positive perceived complexity of technology terms), the majority used technology frequently (77%). The Participants' remarks that technology terms are often simply ignored if

they are not understood. They do not get in the way usage; for example, one subject commented 'normally I pay no attention to complex technology terms'.

b.   Information technology Experience:
There was no stability in the chi-square analyze; the contingency results, however, showed that experience user does not affect perceived complexity of technology terms. It was realized that the majority of new and experienced information technology users' perceived technology terms as complex (78%). The following demonstrate rationalize behind this:

- Participant who is experienced users: 'I feel the more I use technology, the more I learn technology terms'
- Participant who is new technology user: 'I just ignore complex terms . . . I ask for help or simply I close it down and start again''.

6.6.   Component 3: Physical Barriers to Technology Usage
6.6.1. Perceived Changes in Visual Acuity Senses
a. Information Technology Usage:
The chi-square factor denoted some significant (greater than 0.05) positive effect of visual acuity on the information technology usage ($p = 0.059$, $p > 0.05$). The majority of participants, who perceived visual acuity, have the tendency to use technology more than the participants with a lower visual acuity. The following quotes are illustrative examples behind this effect:

- Participants with reduced visual Acuity and low usage: 'I find difficulty in seeing smaller objects and focusing in on objects on the information technology screen. I have sensitivity to glare on the information technology screen'.
- Participants with visual acuity and high usage: 'I can adjust the text size on information technology monitor's display'.

b. Age:
The chi-square test results showed some significant (greater than 0.05) positive effect of age on the information technology usage ($p = 0.068$, $p > 0.05$). The majority of participants, who age group, range between 45-54, have the tendency to use technology more than the participants who age group ranges between, 55-65. The following quotes are illustrative examples behind this effect:

- Participants who age range between 55-65 and low usage: 'I find difficulty in using the information technology', 'I do not need to use information technology at my work'.
- Participants with who age range between 45-54 group and high usage: 'Information technology has become very important nowadays'.

6.6.2. Perceived Changes in Motor functions- Arthritic Hands & Back Pain
a.   Information technology usage:
The chi-square test showed significant positive effect (greater than 0.05) of perceived changes in motor functions- on the information technology usage ($p = 0.067$, $p > 0.05$). Nearly all of participants with no motor physical barriers have the tendency to use technology more often than the participants with motor physical barriers- arthritic hands, back pain. The following quotes are illustrative examples behind this effect:

- Participants with reduced visual Acuity and low usage: 'I find difficulty in pointing and clicking on the mouse', 'not easy to type on the keyboard', 'I get back pain when I use the computer'.

- Participants with no motor physical barriers and high usage: 'I find it easy to use and I have no physical barriers'.

b.   Age:
The chi-square test demonstrate that significant effect of participants age on the alleged motor physical barriers (p = 0.045, p < 0.05). The following quotes demonstrate this effect:

- Participants who age range between 55-65 and low usage: 'I find difficulty in using the information technology'.
- Participants with who age range between 45-54 group and high usage: 'I seek our children for assistance in learning how to use technology'.

6.6.3.   Cognitive Capabilities That Change With Age:
a.   Information technology usage:
There was no stability in the chi-square analyze; the contingency results demonstrate that participant who perceived changes in their Cognitive capabilities due to age does not influence their technology usage. Those that did not have changes in their Cognitive capabilities due to age (negative perceived) used technology often (78%), but even in those that perceived changes in their Cognitive capabilities due to age (positive perceived), the majority used technology frequently (67%). It made no difference in the positive group as to how repeatedly they used technology. The Participants' remarks that 'Information technology helped me to learn English', 'I have the desire to learn information technology skills but I don't learn as easily as before', 'It takes time to get use to information technology', 'Sometime I impress my younger relatives with my new information technology skills'.

b.   Age:
The chi-square test demonstrate that significant effect of participants age on Cognitive capabilities (p = 0.0398, p < 0.05). The following quotes demonstrate this effect:

- Participants who age range between 55-65 and low usage: 'I find difficulty in remembering my information technology password'.
- Participants with who age range between 45-54 group and high usage: 'I seek our children for assistance in relearning something again, after having forgotten'

6.7.   Component 4: Other Barriers
6.7.1. Training:
59% of the participants were self-taught or depend on their children or friends, with the rest being taught in class or seminar, 41%. Nevertheless, all the participants benefit from the support of family and friends for frequent referred to for help. The following quotes describe of the necessity for information technology training aimed at the school principles: 'I needs to find the time to learn how to use technology'; 'I find it necessary and have the desire to learn information technology skills', 'I hesitate sometime to take risks and explore the information technology applications in fear of breaking the machine or making errors', 'it useful and practical to learner the usage of latest technology', 'tend to learn from practical learning activities in technology class.

6.7.2. Perceived Younger Setting:
None of the participants had used the information technology outside their home or work environment, for that reason we did not have any statistics to evaluate whether comfort in a perceived younger setting had any influence on technology usage.

7. Discussion

7.1. Introduction
This research objective is to examine the barriers that impact technology usage for school principles, in Lebanon. The result for each of these possible barriers will be discussed in turn.

7.2. Component 2: Psychological Barriers to Technology Usage
7.2.1. Perceived Usefulness
Perceived usefulness of technology was found to significantly affect technology usage. The fact that most of the participants describe technology as useful could account for the fact that most of the participants had already made an effort to utilize technology and were consequently more probably realize it as useful.   The majority of new and experienced participants perceived technology as useful. The outcome of the data might influence technology uptake in the future, as it indicate that there is an growing demand to use the technology due to increased perception and awareness of its use.

7.2.2. Perceived Ease of Use
The results confirm that perceived ease of use of technology had a significant positive effect on technology usage. All of experienced information technology users perceived the technology as easy to use; new technology users were equally negative and positive about perceived ease of use of technology.

7.2.3. Perceived Complexity of Technology Terms
The results of the statistic confirm that complexity of technology terms did not have an effect on technology usage. The majority of new and experienced users perceived technology terms as complex. The result showed that users are ready to deal with some complexity obstruction to technology usage, give that they are aware of it as effective or overall easy to use. Without a doubt, the result demonstrates that if users were faced with complex information technology terms, they will find away go around the complexity, or basically they learn to pay no attention to complex terms. Despite the fact that perceived complexity of technology terms revealed not to have an effect on technology usage, these outcome illustrate that the terms employed by the technology must be tackled and converted into easy to use to improve the user's experience of the technology.

7.3. Component 3: Physical Barriers to Technology Usage

7.3.1. Perceived Changes in visual Acuity Senses
The contingency results showed effect of changes in visual acuity senses on technology usage. The majority of participants, who perceived visual acuity, have the tendency to use technology more than the participants with a lower visual acuity. Previous research has shown that changes in perceptual senses that develop with age affect the self-efficacy and attitudes towards information technology usage, (Mayhorn, Stronge, McLaughlin, & Rogers, 2004). The decrease in visual acuity leads to struggle in looking at small prints on the information technology display or concentrates for a long time. Adjustments for these issues are to incorporate bigger print and graphics on the information technology screen for the users, and maybe use multi-focal lenses (Selwyn, Gorard, & Furlong, 2003). It is also normal to have sensitivity to

glare on the keyboard and information technology display, which can be minimized by relocate the PC to a spot where light beam is not directly reflecting on the keyboard or the display or using a screen cover.

7.3.2. Perceived Changes in Motor Functions- Arthritic Hands & Back Pain
A significant positive effect of perceived motor functions changes on the information technology usage. Nearly all of participants with no motor physical deficits have the tendency to use technology more often than the participants with motor physical deficits - arthritic hands, back pain. Deterioration in physical performance is another concern that should be taking into account when designing instruction. Previous study has shown that with age it is common challenges in pointing and clicking on items or dragging objects on the information technology display, and single or double clicking the mouse, (Mayhorn, Stronge, McLaughlin, & Rogers, 2004). Adjustments for these motor physical barriers embrace adjusting the mouse clicks settings, using keyboard shortcuts, and using touch pads, roll balls, or touch screens devices as alternatives. Furthermore, practicing information technology activities regularly can develop such physical motor skills, (Mayhorn, Stronge, McLaughlin, & Rogers, 2004).

7.3.3. Cognitive Capabilities That Changes With Age
The results demonstrate that there was no effect of the cognitive capabilities on technology usage. Participant who perceived changes in their cognitive capabilities due to age does not influence their technology usage. Participant that did not have changes in their cognitive capabilities due to age (negative perceived) used technology often, but even in those that participants who perceived changes in their cognitive capabilities due to age (positive perceived), the majority used technology frequently. It made no difference in the positive group as to how repeatedly they used technology. Previous research on cognitive ageing denoted that older users are more frequently face obstacles due to cognitive and physiological changes; the researchers explained that practice using the information technology may reverse some of these effects and can contribute to positive effect, (Mayhorn, Stronge, McLaughlin, & Rogers, 2004). Mayhorn in 2004 explained that cognitive changes, such as processing speeds, attentiveness, and retention, are as well connected to aging. Therefore, specific training must be used when training adults. The method of teaching must be carefully being designed to minimize the learners brain overload and overwhelm by information. The information should be divided into pieces to successfully help them learn. It is also important to use clear and simple language in the training, (Bean & Laven, 2003). In addition, allowing adults with sufficient time for information processing; and frequent review and practice is imperative to reinforce the content and to assist in memory functions in order to encourage " . . . new skills to become automatic" (Bean & Laven, 2003). Another research has shown that middle and older age people often lack patience, (Selwyn, Gorard, & Furlong, 2003); for that reason, we should encourage learners to direct their own learning and maintain classes small, and allow them to express their needs. Also, we should teach them at slow base and put emphasis on practical learning methods through doing it themselves.

7.4.   Component 4: Other barriers

7.4.1. Training:
The results of this research demonstrate that more than half of the participants, 59%, were self-taught or depend on their children or friends, with the rest 41%, being taught in class or seminar. Nevertheless, all the participants in both groups benefit from the support of family and friends for frequent help. A major challenge of Lebanese societies is the progressive growing gap between the generations. In particular as swift rising of new technologies increase the distance between the younger and the middle age generations. Adults who are motivated to learn how to use technology and they didn't have the exposure

younger people had, but want to use the technology to keep up with the advancing world, will benefit greatly from information technology training sessions. Previous research demonstrates showed that successful information technology training sessions that produce proficient learners, help to support the confidence of information technology users; therefore, (Mayhorn, Stronge, McLaughlin, & Rogers, 2004). Society has the duty to offer suitable educational tools to train digital immigrants how to be practical, convenient, and serious users of technology (Selber, 2004). Without providing accessible education geared towards them, this generation is not given fair opportunity.

7.4.2. Perceived Younger Setting:
No effects of perceived younger setting were found in this study. None of the participants had used the information technology outside their home or work environment, for that reason we did not have any statistics to evaluate whether comfort in a perceived younger setting had any influence on technology usage. As the number of adult information technology users' increase, technologies are becoming more available: coffee shops, shopping centers, stores, libraries, community centers, relatives' homes (Selwyn, Gorard, & Furlong, 2003).

8.   Conclusion
The desire and need to utilize technology is growing between Lebanese public school principals. With the rapid increase of technology that make everyday tasks more efficient, effective, and convenient, there are a growing number of digital immigrants who find it necessary and have the desire to learn information technology skills (Selwyn, Gorard, & Furlong, 2003). Presenting the opportunities for Lebanese Public school principals to learn technology is vital. In the same way that students use technology to make everyday tasks easier, the Lebanese Public school principals should have access to training that will offer them with the equal knowledge and skills. Lebanese's school principles like any other demographic, need to be given fair opportunities to attain the benefits of technology. Designers must be sensitive that Lebanese's school principles learn differently as opposed to the way younger adults learn due to factors that develop with age; therefore, special considerations in designing technology training lessons must be incorporated. Mayhorn et al. (2004) summarized, "Factors such as previous information technology experience, information technology anxiety, and perceived effectiveness may interact to influence the development of the attitudes towards information technology" (p. 192). It is very important to demote Lebanese public school principal's fear of information technology technology and to encourage their reliance on technology. Finally, more research is also needed as whether the training was useful. It would be useful to look at the barriers from the trainers' perspectives; also more research is needed on the training programs and manuals and how we could design a simpler and more consistently technology training that would help to demote the barriers summarize in this study. This would provide more direct assist than having to depend on friends and family who might not all the time is accessible.

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