



**ATTITUDES, PERCEPTIONS AND VIEWS OF ARAB
PHARMACISTS AND PHARMACY STUDENTS
REGARDING THE EFFECTIVENESS OF E-LEARNING
AND WEB 2.0 TOOLS IN TRANSFERRING OF
PHARMACEUTICAL KNOWLEDGE**

BY

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ABSTRACT

E-learning is considered one of the major trends in the digital age. Online learning helps pharmacy students and pharmacy practitioners to continue their professional development and to improve their skills via the internet. E-learning has positive effects on medical and pharmacy education in developed countries. Educators nowadays can build online educational materials based on their students learning styles and manage the learning process through learning management systems. However, scarce research efforts have been observed about the effectiveness of e-learning and web 2.0 tools in pharmacy education regarding transferring of pharmaceutical knowledge in Arabic Language Speaking Countries (ALSCs). This study consolidated into two phases. In the first phase a cross-sectional study design has been adopted to evaluate the attitudes and perceptions of Arab pharmacists and pharmacy students. While one-group pre-test post-test study design has been used in the second phase to assess the effectiveness of using e-learning and web 2.0 tools and explore the views of study participants regarding the effectiveness of using these technologies in transferring of pharmaceutical knowledge. The study results showed that the majority of respondents have highly positive attitudes towards using e-learning and emerging web 2.0 tools in transferring pharmaceutical knowledge. Similarly, the majority of them have high confidence level in learning and shared the same motivation to learn using such novel tools. Using Schoology® as LMS and Facebook® as the most popular social network site was effective. Upon completion of the online course, a significant improvement in the participants' level of knowledge about the studied topic has been observed. Highly positive views of respondents regarding the effectiveness of e-learning and web 2.0 tools have been perceived. Major logistical and technical barriers impeded the successful adoption of e-learning in ALSCs. However, this study showed a promising results regarding using novel online educational technologies in transferring of pharmaceutical knowledge. Further researches are encouraged to study the convenient, compatibility and the effectiveness of e-learning and web 2.0 tools in pharmacy education in ALSCs. A steady expansion in the digital gap between ALSCs and developed nations empowers launching well-planned initiatives to facilitate the proper use and implementation of novel technologies in pharmacy education.

خُلاصة البحث

يُعتبر التعليم الإلكتروني واحد من أهم التوجهات في العصر الرقمي. يُساعد التعليم الإلكتروني طلاب الصيدلة والصيدالة في استمرار تطويرهم مهنيًا وفي تطوير مهاراتهم عبر الإنترنت. هناك تأثيرات إيجابية للتعليم الإلكتروني على التعليم الطبي والصيدلاني في الدول المتقدمة. بإمكان معلّمي اليوم إنشاء مواد تعليمية عبر الإنترنت وفقاً للأنماط التعليمية لطلابهم وإدارة العملية التعليمية عبر منظومات إدارة التعليم الإلكترونية. مع ذلك، هناك القليل من الأبحاث حول فعالية استخدام التعليم الإلكتروني والجيل الثاني من أدوات الويب الحديثة في التعليم الصيدلاني في الدول الناطقة باللغة العربية بغرض نقل المعرفة الصيدلانية. تضمنت هذه الدراسة طورين. تمّ استخدام تصميم من نمط Cross-sectional في الطور الأوّل من هذه الدراسة بهدف تقييم مواقف وتصورات الصيادلة وطلاب الصيدلة العرب. في حين تمّ اعتماد تصميم One-group pre-test post-test في المرحلة الثانية لتقييم فعالية وآراء المشاركين في الدراسة فيما يتعلّق باستخدام التعليم الإلكتروني والجيل الثاني من أدوات الويب الحديثة في نقل المعرفة الصيدلانية. أظهرت نتائج الدراسة أنّ لغالبية المشاركين مواقف إيجابية بشكلٍ عالٍ فيما يخص استخدام التعليم الإلكتروني والجيل الثاني لأدوات الويب الحديثة في نقل المعرفة الصيدلانية. وبالمثل، كان لدى معظمهم ثقة عالية في التعلّم وكانوا يتقاسمون نفس الدافع نحو التعلّم باستخدام الجيل الثاني لأدوات الويب الحديثة. كان الاستخدام فعّالاً لأداة سكولوجي كمنظومة إدارة تعليم وفيس بوك كأكثر موقع تواصل اجتماعي شعبيةً. لوحظ زيادة في درجات المعرفة بصورة جليّة بعد حضور مساق إلكتروني عبر شبكة الإنترنت حول الموضوع المدروس. كانت آراء المشاركين إيجابية بشكلٍ عالٍ حول فعالية التعليم الإلكتروني والجيل الثاني من أدوات الويب. هناك عوائق أساسية تحول دون التطبيق الناجح للتعليم الإلكتروني في الدول الناطقة باللغة العربية مثل مشاكل تكنولوجيا المعلومات والاتصالات، وحواجز اللغة، والحروب والصراعات السياسية، وضعف التعليم، وارتفاع تكاليف التواصل عبر الإنترنت، وعدم وجود مُعلّمين مؤهلين ومتمرسين في تكنولوجيا المعلومات والاتصالات. رغم هذا، فقد أظهرت هذه الدراسة نتائج واعدة فيما يتعلق باستخدام التقنيات التعليمية المبتكرة في نقل المعرفة الصيدلانية. يُوصى بأبحاث أخرى في الدول الناطقة باللغة العربية لدراسة فعالية وملائمة وتوافق التعليم الإلكتروني والجيل الثاني من أدوات الويب في التعليم الطبي والصيدلاني. هناك زيادة مُطرّدة في اتساع الفجوة الرقمية بين الدول الناطقة باللغة العربية والدول المتقدمة، ممّا يدفع إطلاق مبادرات مُخطّط له بصورة جيّدة لتسهيل الاستخدام الأنسب وتطبيق التكنولوجيات المبتكرة في التعليم الصيدلاني.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion; it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master in Pharmaceutical Sciences (Pharmacy Practice).

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DECLARATION

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Finally, I dedicate this work for all Arab countries wishing policy makers to get benefits from the findings of this research towards minimizing the digital gap between Arab states and developed nations.

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LIST OF ABBREVIATIONS

ALSCs	Arabic Language Speaking Countries
AUC	Area Under the Curve
CAL	Computer-Assisted Learning
CPD	Continuous Professional Development
CPE	Continuous Pharmacy Education
CVI	Content Validity Index
EdTech	Educational Technology
E-Learning	Electronic Learning
ICT	Information and Communications Technology
IT	Information Technology
LAU	Lebanese American University
LMS	Learning Management System
MCQs	Multiple Choice Questions
ME	Middle East
mHealth	Mobile Health
MOE	Margin of Error
NEJM	New England Journal of Medicine
PBL	Problem-Based Learning
PharmD	Doctor of Pharmacy
SNSs	Social Network Sites
UAE	United Arab Emirates
WBL	Web-Based Learning
Web 2.0	The Second Generation of Web
WHO	World Health Organization
WWW	World Wide Web

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CHAPTER ONE

INTRODUCTION

1.1. BACKGROUND OF THE S33TUDY

Online learning is considered one of the major trends in the digital age. Pharmacists and other healthcare professionals can improve their skills via the internet. Literature showed that online learning helps pharmacy students and pharmacy practitioners to continue their professional development (DiPiro, 1999; Pereira and Murzyn, 2001; Erickson, Chang et al., 2003; Brock and Smith, 2007). Web-based learning has positive effects in medical education (Raupach, Münscher et al., 2010; Pelayo, Cebrián et al., 2011; Boye, Moen et al., 2012). Educators nowadays can build educational materials based on their students learning styles, so they can offer videos, audios, lectures notes and slides. Online materials can be downloaded easily through a learning management system (LMS) where learners can access to course materials and have direct discussions with instructors. Emerging online educational technologies (EdTech) and web 2.0 tools have been used globally in transferring of knowledge via the internet. Notably, there is a huge pressure on faculty staff members to apply these technologies in classrooms (Rogers, 2000; T. 2012). Web 2.0 tools help learners to stay connected with the latest emerging knowledge in any field of knowledge (McAndrew and Johnston, 2012). One of the benefits of online educational technologies is creating a collaborative virtual space not dependent on time or place which facilitate inter professional education (Pittenger, 2013). Educational technology tools give solutions to many barriers that might prevent achieving effective education, like higher costs regarding interactive face-to face learning, more workload on staff members, space limits, so teaching others

who are in different geographical locations and time zones is promising step (Zhu, 2006; Shen, Nuankhieo et al., 2008). Also, these technologies will help educators to make a powerful channel to reach public and to build online networks and study groups with their students and other experts (Selwyn, 2007; Brown and Adler, 2008; Munoz and Towner, 2009). Well-designed online instructional models and easy access to educational materials are the most important factors for successful and effective e-learning (Chumley-Jones, Dobbie et al., 2002; Wiecha, Vanderschmidt et al, 2002; Cook, 2007; Cook and McDonald, 2008). However, disadvantages of adopting these emerging trends include the lack of interaction between instructor and students, time and efforts by faculty members and programmers, hardware and software requirements, time needed for course preparation and lack of technical expertise (Schitteck Janda, Tani Botticelli et al., 2005; Parker and Howland, 2006; Cook, 2007).

Computer-aided learning (CAL) is used effectively in pharmacy education to reduce education costs and to make learning more available to students (Craig SL, 1999). Vanderbush et al. showed that integration of informatics into pharmacy education is considered a time investment (Vanderbush, Anderson Jr et al, 2007). Unfortunately, integration of online educational tools in pharmacy education was not feasible because of some barriers like costs, resistance of change by faculty members and huge amount of time needed to create interactive online courses (Grant, Owen et al., 2011). Although pharmacy students are familiar with social media, their use of online educational tools is scarce (Grant, Owen et al., 2011). Integration of web 2.0 tools like Facebook® into pharmacy education may be useful to engage pharmacy students to learn in a consistent manner, especially when more expert pharmacists share their experiences and knowledge with others. About 1.04 billion users on are using Facebook® in a daily basis (newsroom, 2016). The millennial generation of

undergraduate and postgraduate pharmacy students are using Facebook[®] nowadays to communicate with their friends, family members, colleagues, experts and use it for educational purposes. It has been reported that pharmacists are using social media tools more than other health care professionals (Lupiáñez-Villanueva, Ángel Mayer et al., 2009).

However, these trends are scarce in the majority of Arabic Language Speaking Countries (ALSCs) where traditional and didactic educational methods are still being used with some exceptions seen in Palestine, Kuwait, Jordan, Saudi Arabia, Egypt, UAE and Qatar. Although these new trends are promising to push pharmacy and medical education forward, the major barriers regarding adaptation of e-learning and new online educational technologies in Arab states have been reported. The major barriers reported in the literature were higher connectivity costs, ICT problems, language barriers, wars and political conflicts, poor education, financial problems, lack of qualified ICT-savvy educators (Abouchedid and Eid, 2004; Babiker, 2014; Dutta and Coury, 2002; Hamdy, 2007; Mirza, 1998).

1.2. STATEMENT OF THE PROBLEM

E-learning is playing crucial role nowadays in pharmacy and medical education. Social network sites (SNSs) and other novel web 2.0 tools are being used by learners to share their knowledge and expertise. Podcasting, webinars and learning management systems (LMSs) have been used successfully in medical and pharmacy education. Personal computers and smart phones assist learners to enroll in various online courses. E-learning and emerging web 2.0 tools have been adopted successfully in pharmacy and medical education in developed countries as novel teaching tools. However, traditional didactic educational methods are still used in the majority of Arabic Language Speaking