Workshop on Literature Searching and References Managing for Freshmen of Morphology Class

Taller de Búsqueda de Literatura y Manejo de Referencias Bibliográficas para Estudiantes de Primer Año de un Curso de Morfología

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SUMMARY: This paper presents the design and implementation of a workshop based on the integration of Internet-based technologies, for literature research and preparation of citations for freshmen in the career of dentistry (n = 30) enrolled from the morphology class. Most students achieved the proposed competencies; the presentation of a search strategy and a uniform format delivers in better references and best evaluated activities (averaging 4.5 points, up to 5). This research provides new evidence on practices that can be incorporated, give and deliver literacy information, according to training dental curriculum.

KEY WORDS: Academic skills; Computers in dentistry; Curriculum; Teaching information literacy skills; Web-based technologies; Facebook; Morphology; Anatomy.

INTRODUCTION

Nowadays, scientific and technological advances that lead to new knowledge, and increase the amount of available material for the academic researcher in bibliographic databases, continues expanding in an exceptional rate (Hunt & Newman, 1997). With the main objective to maintain the status of the respected biomedical sciences profession, it is important to achieve a good scientific basis; dentistry should appreciate and incorporate this advancement into their educational systems and patient care (Carvalho *et al.*, 2013).

This continuing explosion in biomedical research and new information makes it more difficult for dentists to access and evaluate the necessary information, in order to make intelligent choices regarding patient care (Hunt & Newman). Currently a huge amount of scientific information is available free (Open Access) (Carvalho, *et al.*) or is database restricted; it should be examined focusing on the credibility, reliability, timeliness and relevance to perform an specific task or to solve the studied problem (Kingsley *et al.*, 2011).

In order to find scientific literature, a documentation process should be carried out, named bibliographic research. Bibliographic research is the key to generate new knowledge and develop ideas, to review the state of the actual knowledge on important subjects, contextualize the investigation problem in an actualized theoretical scene, and to compare different methodological approaches for its resolution (Sandars, 2012). Quoting use, and its correspondent bibliographic reference list is the most habitual form to reutilize in a licit way the published content and thanks to that, use the existent information in the interest field as a base to develop and gain new knowledge.

The proliferation of online data has precipitated the need for more curricular activities in higher education centers and health care, for those students who are seeking and training; scientific literature is an effective way to evaluate the information obtained (Kingsley *et al.*) before quoting and list the products of that exercise.

This paper presents the design and implementation of a based workshop on the integration of Internet-based technologies to acquire knowledge and its implementation with freshmen dental students. In addition, we present the students performance, and some recommendations for future modifications in order to facilitate the teaching environment, learning and assessment.

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MATERIAL AND METHOD

Participants. The study design consists of a convenience sample of 30 dentistry freshmen from the University of Talca, Chile. Students were volunteers, enrolled from the morphology class (integration of anatomy, embryology and histology), who participated in a teaching situation called "Workshop on literature searching and references managing", generated as an extracurricular activity, outside school hours and led by an academic of the Faculty of Health Sciences of the same university (CR). All procedures were approved according to the Committee on Bioethics of the University of Talca.

Designing the teaching situation. Three workshops were conducted with 10 students each one, in units of the Department of Basic Biomedical Sciences, University of Talca, Chile. Each workshop contemplates two sessions, with one week intervals. In the first session of the workshop, the academic introduced to basic information about scientific literature and some references styles, centered on the presented concepts showed in Table I. Following the theoretical exposition, the installation of EndNote® Web was made, on the personal computers of the participants, to manage references. After a recess, exercises were conducted to search interest topics, raised by the workshop participants.

To evaluate the achievement and compromise related to the exercises, a three level rubric (Table II, evaluation section) was prepared according to lineaments published previously (Brodie *et al.*, 2000); resuming: insufficient (objective not accomplished) 0 points, competent (achieved work, using help or guidance) 3 points, excellent (fully achieved objective, without tutorial help; autonomic condition) 5 points. This allowed judgments to be issued with respect of the needed and required tasks or to confront natural situations that could be presented or observed.

Finishing the first session, students were asked to write and develop a text of 500 words according to a topic of their interest, which should contain related references.

The second session started with the delivery of the required works and the exposition of the search strategy. At the close of the activity, themes were discussed and exposed by the students, to discuss and solve difficulties. After a break, we applied a theoretical and practical examination (http://www.cesarrivera.cl/research/sf21072013.pdf).

Facebook Website. To support academic activity a private Facebook group was created, (http://www.facebook.com/groups/drrivera/) (to maintain confidentiality of the social

Table I. Introductory theoretical concepts showed in part during the inaugural session.

Concept	Content
Scientific Literature	The relationship that an author establishes with a public professional about actions, studies and ideas using a carefully language, so that sentences and words become coherent and interrelated (Cajal, 2013).
Bibliographic Research	Group of activities directed to locate and recover primary documents related to a given topic
Bibliographic Research Purposes	i) Increase knowledge. ii) State the ability to find relevant information. iii) To critically evaluate research.
Hierarchical and pyramidal model of evidence search (5S de Haynes)	Original studies. Systematic Reviews and clinical practice guidelines. Structured abstracts from an original article. Collective abstract from several studies about a topic. Decision making on support systems (Haynes, 2006).
Reliable sources	Refereed literature. Institutional prestige of the issuing body. Impact factor of the information (Thomson Reuters ISI rankings, SCImago).
Search Engines and databases	Strategies for the use of search engines and databases. PubMed, Google Scholar, SciELO, MEDLINE.
Bibliographic References Elaboration	To find the source of relevant information. To show a reference according to diverse styles. Several styles in order to be cited within the text. Construction: Author, studio name, journal name, year, volume, number, page(s).
Bibliographic References Manager	A program that allows storage of reference information for articles, books or other content and its posterior insertion while writing a text.

Table II Design of the didactic situation for students of first year of morphology class from a Chilean dental school.

Learning Purpose	Ontogenic Obstacle	Pedagogical Obstacle	Epistemic Obstacle
To make reliable searches of scientific literature and to elaborate texts and references from their findings.	Poor knowledge of the students about databases in order to obtain scientific articles.	Subject to distraction when personal computers and social networks (Facebook) are being used.	Students lack of instruction in order to search scientific literature.

Didactical Strategy	
Problem Based Learning	
Conceptual Map	

Strategies to avoid obstacles
The workshop generates an approach for the students with the contents, scheduled activities. It makes a social experience for academic learning.
Using the methodology of Problem Based Learning, will be the solution for the problem (finding manuscripts and correct preparation of a text with references, so students may achieve a diagnostic of learning needs, build knowledge and work cooperatively.
Through the concept map, students may expose strategies and new criteria that could lead to the outcome to solve and answer the given problem.

Didactical contract to be established

Roles	In a classroom at the University of Talca a workshop for literature research and reference preparation will be held. **Teaching role**: To report basic information about scientific literature research and list references of diverse styles. To perform an introduction related to the issues and to deliver information for the students in order to organize their participation in product development. To act as a monitor in the progress of a requested work. To participate guiding the work of students in non-contact hours. **Student's role:** To research scientific information related to selected themes, and particularly aspects related to them. They should show their progress in every workshop, each time that his or her instructor requires it. They will finish their activity with a conceptual map that resumes their strategy research, which will be reported to their classmates, and then, a report will be written according to the schedule and required format provided by the instructor.
Learning moment based on competencies	The knowledge workshop has three moments of based learning competences. The anchorage (previous knowledge relation), appropriation (new knowledge, abilities or capabilities integration) and production (more complex products generation, so students integrate them)
Students work time	Work in attendance: Two sessions of 2 and half hours (30 minutes for teacher's presentation, and then process closure for the rest of the class; supervision of the work progress guided by the instructor). To backup information; this will be shown in real time, published in a Facebook group.
Materials and instruments required for the activity	Data show, Microsoft Office® (Microsoft Power Point , Microsoft Word), Internet Browsers (Internet Explorer, Mozilla Firefox, Google Chrome, Safari, etc.), Bibliographic References Software EndNote® Web, Personal computer for each student or research participant, Wi-Fi connection to Internet (University Wireless Internet Connection), Acrylic Board, Pencils, Board Eraser, Class Hall Room.
Product	Search strategy and results presentation obtained by the students. Scientific report, writing citations after the workshop.
Evaluation	**Competencies** Declared competencies in the exit profile from the University of Talca: To apply the scientific method in order to solve health problems. Sub-competition workshop: Perform literature search and to develop text and articles with references of the searched products. **Dimensions** Levels: Insufficient (objective not accomplished) 0 points, Competent (achieved work, using help or guidance) 3 points, Excellent (Fully achieved objective, without tutorial help; autonomic condition) 5 points. **Criteria** • B egin break down of the components of the research question • W ell defined keywords • T o Find synonyms for its terms • I dentifies the controlled terms (MeSH). • A dds new terms and objectives • Develop and considers strategies in order to find a well adjusted number of quotes and references (filters/limits). • R eads and check the abstracts and values its modifications • S t rategy application for research into other databases • C onceptual map drawing according to the workshop advance • W rite a text that synthetizes the information of its papers, according to the indicated format (500 maximal words). • G ives text references in an understandable format and according to a bibliographic style. **Feedback** Workshop conversation in the private group found on *http://www.facebook.com/groups/drrivera/,* developed for the academic in charge. Conversation with the docent/tutor, though activity development Questions and doubts during non-present hours through Facebook platform

network members). The students were asked to find the page on Facebook and manifest a "like", in order to see all posts in their news feed and to be able to comment an publish into the group wall and also comment on the posts of other users. Students were told that "before" the page was voluntary, it would be used as an important method to communicate and guide the activities of the course in real time. Participants and members were asked to modify their Facebook profiles, previously to join the private group, with the intention to hide and not show their personal information to the other members on the group.

RESULTS

In the research exercise, all students achieved the needed skills for the listed conditions in the evaluation criteria. A concept map with the search strategy and the delivery of uniform references, obtained the highest evaluations, both with an average of 4.5 points (Fig. 1). They were followed by free terms addition, with an average of 4.2 and key terms definition with 4 points.

In the test after the workshop, 100% of students correctly answered the first 4 test sections (A, B, C) and the last two sections (E, F and G). The case was very different for the Section D, where only 6 students (17%) correctly answered the question, item that was a technology-dependent item.

Among difficulties reported by the students, lack of English grammar, compression and its verbal management was the main problem. Poor vocabulary was also present according to biomedical and scientific (scientist) words and some items managed by students.

The evaluation of the Facebook group as a communication tool was positive, although, at the beginning of the workshop, students were skeptical about displaying messages related to the activity; 73% of them (n=22) reported at least one message on the group wall.
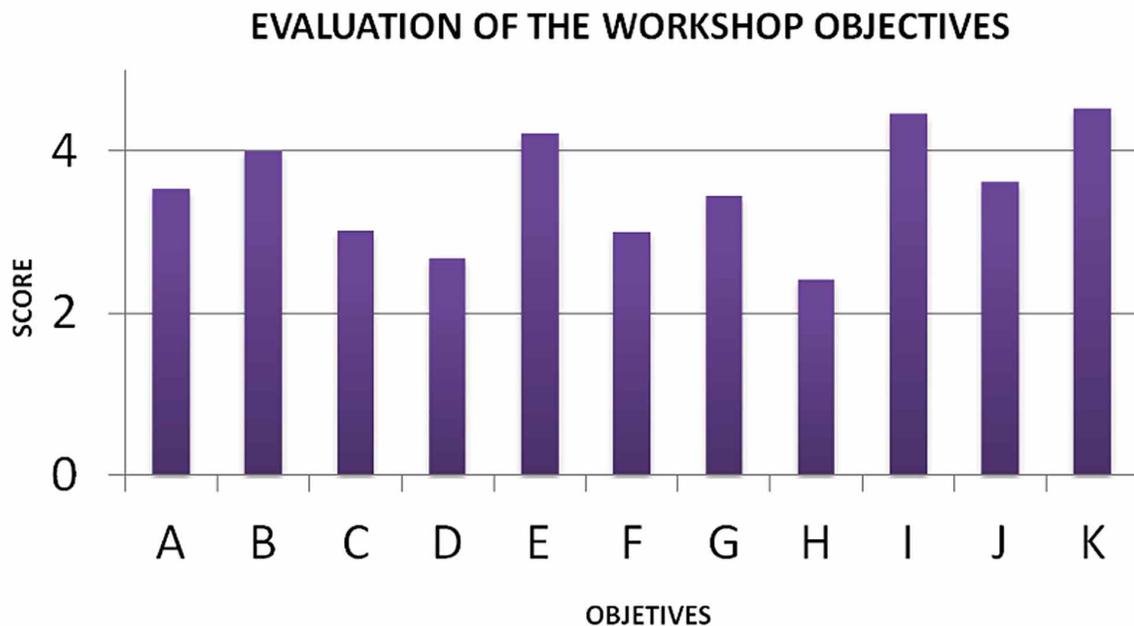

Fig. 1. Evaluated objectives on the workshop. Starts disclosing the question's components from the investigation (A). Defines the principal terms (B). Search for term synonyms (C). Identifies MeSH controlled terms (D). Adds free terms (E). Considers strategies in order to find a number of references adjusted for his work (F). Abstracts review and modifications valuation (G). Applies strategies using another databases (H). Develops a conceptual map according to workshop work and advance (I). Writes a text that synthesizes his/her paper information (J). Delivers text's references in a uniform format, related to the bibliographic style (K). Criteria is evaluated according to some points, such as insufficient (does not achieve the objective) 0 points; competent (achieves objective using help) 3 points, and excellent (autonomic achievement of the objective) 5 points.

DISCUSSION

In this study, we present the design of a workshop for literature research and preparation of references. As a bonus, we examined the ability of undergraduate freshmen to use Internet based technologies, on browsing and biomedical research process. In order to complete the challenges in the workshop, students used different technology dependent techniques: after searching and obtaining online bibliographic resources, the understanding of how the biomedical literature was organized, how to use search engines and databases data, and finally how to interpret their findings and make a text representation of selected manuscripts.

This study is related to a small group that seeks to understand and work with literacy information in students of dentistry, and to understand if an author is the first to study the design of an educational activity for scientific literature search in detail, as well as references preparation. Additionally, we have to recognize that confidentiality may not be fully protected, while participating in this social network.

A survey by the Pew Internet & American Life Project in the United States found that 63% use the internet in order to find the information they needed (Estabrook *et al.*, 2007), evidence that must be taken in consideration given that the technologies and applications (Apps) based on Internet, become more frequent in the digital age, and students need to acquire and develop their skills in medical research tasks.

Currently there are no standardized methods for teaching and learning the techniques of literature search and preparation of citations on dentistry students, it is therefore urgent for health sciences and dental curricula, to specifically incorporate technology and information about education through internet and a filtering guide for set the quality of retrieved information (Kingsley & Kingsley, 2009; Sandars); this workshop aims to contribute in this regard.

It should be recognized that this study has limitations. For example, the sample size is relative small. Besides is not a socio-demographic analysis of participants, factors that can influence the results, as they are considered in the digital division (Brodie *et al.*). Also, the educational experience of the participants was not evaluated. One of the main barriers to the students was the poor domain of English as a second language. Given that much of the biomedical literature is presented in this language, the language barrier is a problem that must be overcome (Espinosa & del Campo, 1995).

Initially, we understand that the basis for the n of subjects and the type of statistical analysis is weak. There could be great variability to draw strong conclusions. For future research it is necessary to increase the sample size, a complete characterization of socio-demographic and participants that may involve some other aspects, such as presenting a previous study (Kingsley & Kingsley), where students start from the analysis of a manuscript, and its literature review may begin and successfully complete the search exercises.

As final comments, student's workshop participants tested their practical seminars in different modules, being positively evaluated by other scholars. Results in a classroom led during the academic period following this workshop, were incorporated, but lead to a mandatory activity in other modules, for the full universe of freshmen, so the depth evaluation of metacognitive process will continue.

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RESUMEN: Este estudio presenta el diseño e implementación de un taller fundado en la integración de tecnologías basadas en internet para la búsqueda de literatura y elaboración de referencias bibliográficas por estudiantes de primer año de la carrera de odontología (n=30) del curso de morfología. La mayoría de los estudiantes logró las competencias propuestas, siendo la presentación de la estrategia de búsqueda y la entrega de referencias en formato uniforme las actividades mejor evaluadas (4,5 puntos promedio de un máximo de 5). Esta investigación provee evidencia sobre nuevas prácticas que pueden establecerse para incorporar la alfabetización informacional al curriculum formativo odontológico.

PALABRAS CLAVE: Habilidades académicas; Computadoras en odontología; Plan de estudios; Alfabetización informacional; Las tecnologías basadas en la web; Facebook; Morfología; Anatomía.

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