

The effects of educational models based on *experiential learning* in Medical Education: an international literature review

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SUMMARY

In the scientific literature there are numerous articles concerning the testing of new models of experiential learning in Medical Education. The experiential learning, indeed, is used as a method of training in continuing education in medicine and in many university courses that are intended for doctors, nurses and other health professionals.

We, therefore, designed a literature review to evaluate the existing evidence about the effects of educational models based on experiential learning in university education and continuing training of health and care professionals.

Keywords: experiential learning, learning from experience, change, behavior, practice, reflection, experience

RIASSUNTO

A partire dalle teorie di Dewey, la visione dell'educazione e della formazione è cambiata radicalmente, soprattutto per quanto riguarda il processo di insegnamento/apprendimento. Si è passati, infatti, da una visione di "trasmissione delle conoscenze" ad un modello in cui il soggetto che apprende ha un ruolo inter-attivo nella costruzione della conoscenza.

Questo nuovo concetto (evolutosi in seguito, soprattutto grazie agli studiosi post-deweyani,) ha molto da suggerire alla formazione dei professionisti della salute e della cura.

Nella letteratura scientifica troviamo numerosi articoli riguardanti la sperimentazione di nuovi modelli di apprendimento esperienziale per la formazione (universitaria e continua) nel campo della medicina e della salute. L'apprendimento esperienziale, infatti, è utilizzato come metodo formativo in Medical Education e in molti corsi universitari e non che si rivolgono a medici, infermieri e altri operatori sanitari.

Abbiamo, pertanto, ritenuto utile progettare ed effettuare una revisione della letteratura al fine di valutare i dati esistenti sugli effetti dei modelli educativi basati sull'apprendimento esperienziale nella formazione - universitaria e continua - dei professionisti della salute e della cura.

Parole chiave: experiential learning, apprendimento dall'esperienza, cambiamento, comportamento, pratica, riflessione, esperienza

INTRODUCTION

As the conditions of medical practice have been changing in the past 20 years, the possibilities and conceptions of Continuing Medical Education (CME) have also changed [1].

Today's health care professionals must function in complex and changing health care systems, continuously refresh and update their knowledge and skills, and frame and solve complex patient and healthcare problems. Preparing professionals who possess these capabilities is correspondingly complex [2].

Various programs have been developed to bridge the gap between what should be practiced and what is actually done, but few have been uniformly successful. Passive education, such as conferences or the publication of clinical practice guidelines, has been shown consistently to be ineffective [3].

In recent years, however, has spread a vast literature on the processes of knowledge construction and the "how" to make visible to students the complex dynamics of knowledge construction.

This is possible - particularly in the light of recent studies in the field of Medical Education - through the promotion of "reflective practice" [4] and the "transformative learning" [5] in the training of health professionals, especially through the so-called "narrative approach" [6].

From the experience of many U.S. universities since 1980 has spread to Europe, the Problem Based Learning (PBL), ie the problem-based learning, which is configured as a specific methodology of experiential learning [7].

More active strategies to implement guidelines, such as educational outreach, feedback, reminder systems, and continuous quality improvement, offer greater promise and have captured the interest of physicians, health systems, hospitals, managed care plans, and quality improvement organizations. To date, however, research on whether these methods produce meaningful change in practice patterns or patient outcomes has yielded mixed results [8]. Physicians interact with peers and mentors to frame issues, brainstorm, validate and share information, make decisions, and create management protocols, all of which contribute to learning in practice. It is

likely that working together in this way creates the best environment, for learning that enhances professional practice and professional judgment [9].

This review of the literature is the result of a research project started in January 2011 as part of an internship followed by the writer (part of the curriculum of the Master program in "Sustainable development and impact assessment" followed at the Center for lifelong learning and retraining of personnel in the health service - CEFPAS - Caltanissetta, Sicily) at the Department of Psychology at Erasmus University in Rotterdam (Tutor: Dr. Silvia Mamede MD, PhD) and concluded in May 2012 at the University Florence, Laboratory of Medical Education as a research Fellow (Tutor: Prof. Dr. Patrizia de Mennato PhD, director of the Laboratory of Medical Education).

EXPERIENTIAL LEARNING DEFINED

Many definitions of Experiential Learning can be found. To guide our review we used these definitions, trying to reconstruct the evolution of the construct.

Dewey [10], who was likely one of the most significant and influential educators of his time, founded an educational movement based, at least in part, on the concept of, "experience plus reflection equals learning". This was the foundation of what came to be termed "progressive education", in that it challenged. It is here that the origins of experiential learning can be seen, with Dewey's recognition of the importance of experience and reflection in learning.

Experiential learning has received considerable coverage in the recent literature on nurse education [11]. The theoretical literature seems to use the term in two different ways.

One approach involves the concept of life as a learning process and thus experiential learning is learning through the process of living, working and generally relating to the world. This approach to the concept of experiential learning is best exemplified by Keeton and his associates [12].

The other approach is via humanistic psychology and emphasises subjective experience, personal interpretation and the education of the emotions.

This approach is best exemplified in the writings of Kilty [13], Shaffer [14] and Heron [15]. From a Freirian [16] and Illichian [17] perspective the focus that experiential learning puts on an individual's experience rather than the learning institution's (and hence the government or state) is highly significant. For when the locus of control of what is learnt lies with the individual, then the potential for the challenge of social norms becomes a reality, a "bottom up" rather than a "top down" change agent.

Apart from these two main themes in the experiential learning literature, there are also some 'hybrids'. Kolb [18], for example, combines some of the 'learning through the process of living' approach with ideas from Carl Rogers and Carl Jung and applies, almost paradoxically, a fairly rigorous quantitative approach to researching his theoretical constructs. Boydel's [19] theoretical approach also seems to stand outside the mainstream humanistic approach and yet does not fit completely into the first approach either.

For Kolb and Fry [20], the experiential learning is the process of making meaning from direct experience. He helped to popularize the idea of experiential learning drawing heavily on the work of John Dewey, Kurt Lewin, and Jean Piaget. His work on experiential learning has contributed greatly to expanding the philosophy of experiential education. The root of this model can be found in very early descriptions of educational settings; certainly descriptions of teaching by Socrates utilized similar inquiry-based practices. Experiential learning, indeed, is related to -but not synonymous- with experiential education, action learning, adventure learning, free choice learning, cooperative learning, service learning, reflective practice and adult education. While there are relationships and connections between all these theories of education, importantly they are also separate terms with separate meanings. In its simplest form, experiential learning is learning achieved through the appropriate use of experience. In other words, experiential learning is a form of learning by doing. Kolb and Fry's experiential learning model is a continuous spiral process which consists of four basic elements:

1. concrete experience;
2. observation and reflection;

3. forming abstract concepts;
4. testing in new situations.

Immediate or concrete experiences are the basis for observation and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can be drawn.

McGill and Warner Weis [21] attempted to provide a definition that incorporated a wide range of interpretations: "The process whereby people engage in direct encounter, then purposefully reflect upon, validate, transform, give personal meaning to and seek to integrate their different ways of knowing. Experiential learning therefore enables the discovery of possibilities that may not be evident from direct experience alone".

Burnard [22] summarized experiential learning as: "learning by doing, which involves reflection and is an active rather than a passive learning process".

Cohen, Boud and Walker [23] developed five propositions concerning experiential learning. They identified that experience is the foundation of and stimulus for learning, learners actively learn, in a holistic way, which is socially and culturally constructed and influenced by the socio-emotional context in which it occurs. The outcome of learning, subsequent to the ideas contained within these propositions and within the four villages, is that experiential learning has the potential to result in: self growth, ranging from the individual to communities, and aspects of professional, life and academic education.

A number of authors in the 1990s began to distinguish between levels of depth in reflection [24]. However, they seemed to make the assumption that "no reflection" is associated with "surface learning" whilst "critical reflection" is associated with "deep learning". They do not seem to acknowledge that the stage or level of reflection may be associated with the level of exposure to the experience; in essence, that there may be an inappropriate time for reflection and an appropriate time. If the two taxonomies, reflection and experience are combined, then there exists a potential strategy or framework for experiential learning.

The more significant developments have been in the recognition of the importance of corporate bodies becoming "learning organizations" not just at an in-

dividual level [25]. A number of recently published educational textbooks (both nursing education and general education) contain details of experiential learning approaches based upon Kolb's original work of the 1980's [26]. There is thus a considerable body of knowledge and experience, which acknowledge the significant learning that occurs as a result of reflection upon experience but little in the way underpinning structure as to how that occurs or how as a teacher can facilitate that learning. Finally, in an attempt to give a definition of experiential learning, Valkanos and Fragoulis [27] would say that the experiential learning is a process by which learners are invited to live and conscientiously understand their own reflections, feelings, actions and reactions to a particular situation. This can be achieved either by simply sharing one of their experiences relating to a cognitive object or by participating in the representation of a given situation – real or imaginary – which is introduced by the educator in the form of a fact or incident, etc. and which is offered, so that participants can understand more deeply all parameters of the situation and develop their relevant abilities.

METHOD

We conducted a systematic review of the research literature in the area of educational models on experiential learning in the continuing education of health professionals.

Selection process

The *PubMed* and *Educational Resources Information Center (ERIC)* databases were searched using the following keywords: *experiential learning – learning from experience – change – behavior – practice – reflection – experience*.

We also conducted hand searches and reviewed bibliographies of identified papers. The search was limited to English language papers published between 1984 and 2011, dealing specifically with education models on experiential learning education of health professionals. The original search in *PubMed* identified more than 622 papers, commentaries and reviews of the literature. To address our specific interest, we excluded

all papers that did not describe research examining the educational models on experiential learning in the continuing education of health professionals. This resulted in the identification of 43 papers.

The original search in *Educational Resources Information Center (ERIC)* identified more than 40 papers but we have narrowed the field even more and we tried to focus our research and we have chosen 4 paper. The identified papers (n. 47) are shown by type of study, journal of publication, country of location, educational level of subjects and profession studied. As shown, the majority of studies reported were in medicine and nursing; the largest percentage of papers was from the United Kingdom (approximately 44,6%) and USA (approximately 40,4%). Moreover 25 of 47 utilized qualitative approaches to address the research question (See Appendix I- Studies Reviewed with Abstract for a detailed overview).

Review procedure

A review of the published literature, limited to the last 27 years, was conducted to include recent updates on medical and nursing education. This was done by systematically searching appropriate databases using keywords. We also conducted hand searches and reviewed bibliographies of identified papers. The search was limited to English language papers published between 1984 and 2011, dealing specifically with medical or health professional education or practice.

To evaluate the premise that experiential learning is essential component of competence in health professionals, and therefore capabilities that must be acquired, we developed the following questions:

- What is the nature of experiential learning?
- What are the areas of medicine in which experiential learning is used?
- Can experiential learning be assessed?
- What contextual influences hinder or enable the development of experiential learning?

RESULTS

The results of the review are structured to summarize the relevant studies that addressed each of these questions in relation to medicine, nursing and

Type of study	Qualitative	n = 25	Nursing Standard	n = 1
	Quantitative	n = 2	Journal of Advanced Nursing	n = 4
	Quasi experimental	n = 1	Journal of Transcultural Nursing	n = 1
	Mixed Methods	n = 4	Journal of Clinical Nursing	n = 1
	Reflective paper	n = 14	Urological Nursing	n = 1
	Literature Review	n = 1	Journal of continuing education in nursing	n = 1
Journals	Medicine		Nurse Educator	n = 3
	Medical Education Online	n = 1	Nursing Ethics	n = 1
	British Medical Journal	n = 1	Other	
	Journal of Allied Health	n = 2	Clinical Psychology & Psychotherapy	n = 1
	Archives of Disease in Childhood	n = 1	Journal of Health Administration Education	n = 1
	Medical Education	n = 3	Action Learning: Research and Practice	n = 1
	American Journal of Pharmaceutical Education	n = 2	Rural and Remote Health	n = 1
	Patient Education and Counseling	n = 1	American Educational Research Association	n = 1
	Medical Teacher	n = 2	Book	n = 1
	Journal of University of Occupational and Environmental Health	n = 1	Location	
	Canadian Journal Neuroscience Nursing	n = 1	USA	n = 20
	Advanced in Health Science Education	n = 1	UK	n = 14
	Journal of Continuing Education in the Health Professions	n = 1	Canada	n = 3
	Dental Update	n = 1	Australia	n = 2
	Association of periOperative Registered Nurses	n = 1	The Netherlands	n = 2
	ANNALS Academy of Medicine Singapore	n = 1	Singapore	n = 2
	Nursing		Tasmania	n = 1
	Nursing Education	n = 2	Belgium	n = 1
	Nurse Education Today	n = 6	Japan	n = 1
			Turkey	n = 1
		TOT.	n = 47	

Table 1. Summary of 47 reviewed research studies.

other health professional contexts. Several studies addressed more than one of our questions. For clarity, we have highlighted the different aspects of a single study under the relevant questions.

What is the nature of experiential learning?

Eight studies were found which addressed this question.

David A. Kolb [28] created his famous model (with Fry in 1975) out of four elements: concrete experience, observation and reflection, the formation of abstract concepts and testing in new situations. He represented these in the famous experiential learning circle that involves (1) concrete experience followed by (2) observation and experience followed by (3) forming abstract concepts followed by (4) testing in new situations (after Kurt Lewin). For Kolb, experiential learning is not a molecular

education concept but rather is a molar concept describing the central process of human adaptation to the social and physical environment.

Learning is the process whereby knowledge is created through the transformation of experience. This definition has several critical aspects of the learning process as viewed from the experiential perspective. First is the emphasis on the process of adaptation and learning as opposed to content or outcomes. Second is that knowledge is a transformation process, being continuously created and recreated, not an independent entity to be acquired or transmitted. Third, learning transforms experience in both its objective and subjective forms. Finally, to understand learning, we must understand the nature of knowledge, and vice versa.

Burnard P. [29] offers an epistemological theory divided into three domains: propositional knowledge, practical knowledge and experiential knowledge, as a basis for a theory of experiential learning. After a description of the theory, experiential learning is redefined and the practical issues relating to the theory are discussed. The paper closes with some thoughts on the problems of research in the field of experiential knowledge.

In the paper of 1987, Barnard studies how the aspects of experiential learning and andragogy may usefully be combined in nurse education. Such a combination needs to take into account certain basic principles such as negotiation, the importance of personal experience and the use of self and peer assessment. What must also be borne in mind, however, is that learner nurses and nurse tutors have to work to a prescribed syllabus of training laid down by the English and Welsh National Boards. This fact makes nurse education somewhat different to many of the experiential learning training workshops at which all of the content may arise out of participants needs and wants. Many nurse tutors may encounter problems in translating workshop experience into practice because of this fact.

Glendon K. and Ulrich D.L. [30] that the focus of education has changed from teaching to learning. This educational model stresses student outcomes that include critical thinking, effective communication, and students' ability to reflect their own learning. This article describes "unfolding cases," a

comprehensive plan of learning that allows student practice time to solve individually and collectively problems they may encounter in clinical situations. It combines a variation and extension of the frequently used strategy of case study with multiple cooperative learning strategies, culminating in an individual reflective writing experience.

Bauchner H., Simpson L. and Chessare J. [31] believe that trying to change physician behaviour in order to improve quality of care is a critically important endeavour for medicine, it reflects current emphasis on cost, evidence, and patient participation in their care. For many physicians, trying to practice up to date medicine is an important part of their professional life. Unfortunately, there is limited time for reading, meeting with colleagues, or reviewing their own practice. We must continue to emphasise creative, efficient, and innovative approaches that help physicians change their behaviour and improve the quality of health care. In this respect, they draw the following recommendations:

- traditional continuing medical education and passive distribution of information is not effective;
- continuing medical education that includes interactive interventions is effective;
- creation and promulgation of guidelines does not impact on patient care;
- guideline implementation within an organization can be effective;
- clinical paths improve inpatient care;
- reminders, both patient and physician, improve quality of preventive health services;
- educational outreach is effective, but time consuming and expensive;
- audit and feedback alone is modestly effective;
- financial incentives can change physician behavior under certain circumstances;

Jarvis P. [32] argues that reflective practice is a frequently used but in-frequently defined concept in nursing. Part of the reason for the lack of definition lies in the fact that there is no theory of practice. This paper lays the foundations for a theory of practice and paves the way for one useful way in which the relationship between theory and practice can be understood. It is suggested that thoughtful

practice is often mistaken for reflective practice, but that the latter can only exist where practice is not taken for granted and so the outcome of practice is more learning from experience. The paper also maintains that for reflective practice to be practiced within the profession it is necessary both to have the structures within which it can be encouraged and the theoretical foundation whereby efficient practice need not only be judged in terms of 'value for money'.

Mander [33] examines the contribution of experience to learning in relation to data collected during a study of midwives' care of relinquishing mothers. The extent to which there is a conflict between experiential learning, valued as a component of andragogy, and aspirations to being a research-based profession is examined. Experience has been shown, by an ongoing research project and the nursing and midwifery literature, to be significant as the basis of learning and the resulting practice. This contributes to a healthy learning process only to the extent that it includes all features of all experience - not just that of a practical, occupational nature - but also the reflective aspects of practical experience, together with the experience of learning from others such as researchers and theorists. The limitation of experience to the work environment alone, or the exclusion of any aspect or area of experience, is a disservice to both the learning itself and to those for whom care is being provided.

For Ringsted C. [34] in experiential learning the learner is highly active in these processes through trial and error practice, whereas in the step-by-step approach the learner takes a more passive role.

Many errors are characterized in the initial stages of learning and Ringsted states that learning from error has received increasing attention in skills training. She hopes that clinical training centers might be places where learners can train in an experiential way, allowing them to make the errors that are necessary for embedding the skills in the long-term memory.

Wallace D. [35], finally, describes a continuing ethnographic study of critical thinking, reflection and experiential learning in nursing. The author examines the related theory and explains the terms of reference which underpin the study. Data analy-

sis so far as the importance of recognizing positive and negative feelings associated with experiences, when engaging in reflection. She also outlines the precursors to effective and non-effective reflection implied by the data. It is suggested that there is no correct model for critical thinking and the author highlights the need for further research into effective and non-effective outcomes of reflection.

These studies have shown that experiential learning is a methodology that can help practitioners and health care in the new learning and management of emotions connected to clinical practice.

The experiential learning, in fact, gives the subject an active role as builder of knowledge, which is also the result of "exchanges" between him and the surrounding environment.

However, emerging terms such as "experiential learning", "collaborative learning", "critical thinking", "cooperative learning", "reflection" and "reflection practices" that seem to be often used as synonyms.

Despite being aware that all the theoretical and methodological influence and determine each other, we need to systematize and distinguish the various theories and methodologies, in particular, in Medical Education.

What are the areas of medicine in which experiential learning is used?

Twenty-one studies were found which addressed this question.

Carpio B.A. and Majumdar B. [36] use experiential learning as an approach to transcultural education for nursing. Experiential learning is a powerful methodology for addressing the affective, as well as the cognitive, domain of learning. The exploration of personal values is an essential first step in developing cultural awareness in order to move learners beyond ethnocentrism through awareness, understanding, acceptance, and appreciation of other cultures if learners are to truly adopt a multicultural approach to their professional practice.

D'Eon M. [37] use experiential learning for Inter-professional education (IPE), a method to enhance the ability of health professionals to learn to work together. He examines several approaches to learn-

ing that can help IPE fulfill its expectations. The learning process itself needs to be approached from an experiential learning framework cycling through the four-stage model of planning, doing, observing and reflecting. By using increasingly complex and relevant cases in cooperative groups with an experiential learning process, interprofessional education can be successful.

Gaby C. Jacobs [38] developed an action learning programme on empowerment to support practitioners in the transformation of their current practice, in line with the health promotion discourse, using a qualitative case-study approach. In this paper, the process and outcomes of reflection as experienced and described by the practitioners in the action learning programme, are discussed against the background of notions of reflection and reflexivity, critical being and critical pedagogy.

The study of Hammer D. [39] defines professionalism in the context of contemporary pharmacy practice, discusses the professional socialization process of student pharmacists, and suggests strategies for preceptors to facilitate the professionalism of the student pharmacists they precept. There are numerous techniques to help students develop positive professional behaviors during experiential learning. Preceptors may already be employing some of these and may have additional ideas that have worked at their sites. Some ideas are described in detail as state explicit expectations; set high standards for students; treat students respectfully; frequent, timely, specific feedback to students; evaluation of students' professional behavior; student feedback to site and preceptors and, in particular, the role modeling.

Linus Vanlaere et al. [40] developed an experiential learning method to generate empathy in the care of vulnerable older persons. The care-ethics lab 'sTimul' originated in 2008 in Flanders with the stimulation of ethical reflection in care providers and care providers in training as its main goal. Also in 2008, sTimul commenced the organization of empathy sessions as an attempt to achieve this goal by simulation. The empathy session is a practical and fairly straightforward way of working to provoke care providers and care providers in training to engage in ethical reflection. Characteristic of the

empathy session in the care-ethics lab is the emphasis on experience as a basis for ethical reflection.

In the article of Grol R. et al. [41] a description is given of what 'implementation' involves in practice, the theoretical points of view regarding changes in care practice and how - in general terms - a programme or project aimed at the introduction of new working methods or changes in practice could be set up. The effective implementation of guidelines, valuable procedures or other innovations, be they new or old, requires a systematic approach with good preparation and planning. The following steps are important in a systematic approach to implementation:

- Formulation of a concrete, well-developed and attainable proposal for change in practice, with clear targets.
- Analysis of the target group and the setting: what are the problems in care provision, and what factors are stimulating or hampering the process of change?
- Development or selection of a set of strategies for change: strategies for both the effective dissemination and the effective implementation and maintenance of change.
- Developing and executing an implementation plan that contains activities, tasks and a timetable.
- Evaluation and, if necessary, revision of the plan: continuous monitoring on the basis of indicators.

These are brought together in a model. Various theories and 'approaches related to the effective implementation of change are integrated into this model.

Hewson Mariana G. et al. [42] developed and implemented a professional development program involving experiential learning and conceptual change teaching approaches in the field of complementary and alternative medicine (CAM). The study demonstrate that it is possible to increase physician knowledge and change attitudes towards integrative medicine with an eight-hour intervention using experiential and conceptual change teaching approaches. The 8-h program consisted of experiential workshops (total of 5 h), in which partici-

pants were actively involved in yoga, massage, Reiki, T'ai Chi, mindfulness meditation, guided imagery relaxation. Specific lectures (total of 3 h) provided scientific data about the selected CAM modalities. The evaluation data showed that the program was successful in achieving its aims. The participant physicians changed from relative ignorance and negative attitudes to having conceptions of CAM that were more intelligible, more plausible, and potentially more fruitful. Their attitudes to CAM became more positive. The Authors found that the one-day program had significant impact in an area that is often viewed with suspicion and doubt.

Ikemi A., Masui T. [43] report a study that they conducted in which the effects of participating in a seminar on counseling skills were demonstrated. The subjects were 11 first and second year medical students who took part in an elective course in medical humanities, in which counseling skills, active listening and experimental focusing were taught. The class met for 10 sessions every other week, in which students were exposed to these techniques. On weeks when the class did not meet, students practiced these techniques in pairs among themselves. At each of these sessions, students filled out a relationship scale and recorded the session into a cassette tape. Furthermore, students filled out personality tests at the first and last class. A comparison of the results of the relationship scale between the first and last session showed a significant increase in the students' ability for empathy (P less than 0.02) and for unconditional positive regard (P less than 0.02). Not enough personality tests were handed in at the last class to provide a useful comparison. Tapes of the sessions are currently being investigated in another study using a different measurement. The authors discuss the need for such experimental courses for medical students to overcome the Cartesian view of seeing others as "objects" and for developing humanistic ways of relating to other persons.

Kidd T. and Kendall S. [44] examine issues of contention regarding current practices and suggests the application of the experiential theory of learning (incorporating reflective practice) to advanced cardiac life support (ACLS) training.

Kinyon J., Keith C.B., Pistole M.C. [45] describe an interdisciplinary, group experiential learning approach used with baccalaureate nursing students as group participants and graduate counseling psychology students as facilitators. This teaching method provides learning to enhance the knowledge and skills of students preparing for both professions. Because many nursing responsibilities are accomplished in groups, undergraduate nursing curricula need to prepare students in the skills required to function effectively in groups.

Lian-Kah Ti et al. [46], because simulators provide an effective platform for the learning of clinical motor skills such as endotracheal intubation -although the optimal learning technique remains unidentified- they hypothesised that, for novices, experiential learning would improve the learning and retention of endotracheal intubation compared with guided learning.

Lockhart J.S. and Resick L.K. [47] describe an undergraduate course in transcultural nursing that relies heavily on experiential learning activities and local community resources. Student evaluations reveal both immediate and long-term effects of this course on graduates' clinical practice.

Papai P., Bourbonnais F.F., Chevrier J. [48] use Kolb's experiential learning model as a framework to help Chinese nurse educators reflect on their practice as clinical teachers. The workshop resulted in the generation of new insights by participants into their role as clinical teachers. Chinese educators wanted to increase their links between the teaching of theory at the college and the instruction of students in the practice setting. The use of a similar approach in future professional development workshops allows presenters to identify nurses' learning needs regarding specific areas of nursing practice and education. Phillips R.M., Bonsteel S.H. [49] highlight that Faculty are challenged to find innovative ways to teach the skills for evidenced-based practice and information literacy. Librarians are natural partners with nurse educators because of their information literacy expertise. The authors describe the development and implementation of simple research projects in an undergraduate nursing research course and the collaboration among course faculty, nursing students, and the information literacy specialist.

In an attempt to excite baccalaureate nursing students about nursing research, a traditional, lecture-style nursing research course was transformed into an experiential, interactive course [50]. Attitudes toward research were compared between students who received the lecture course and those who participated in the experiential course. Students in the experiential course exhibited significantly more positive attitudes toward nursing research than students in the traditional lecture course.

Sewchuk D.H. [51] develops a “perioperative nursing course” that uses Kolb’s experiential learning theory and learning cycle as a framework to provide nurses new to the OR with a solid knowledge base with which to further their practice. This framework can be used to leverage learning style, promote critical thinking, and encourage active learning.

The models of reflective practice and experiential learning, described within the article of Simpson K, Freeman R. [52], provide the dental practitioner and his/her team with realistic methods by which they can improve their skills and working atmosphere, and also reduce occupational stress.

Smith L.M., Emmett H.E., Woods M. [53] highlight that the intent to improve the health status of the population served through community practice nursing interventions, guided by primary health care principles, is common to all clinical placements. A curriculum designed to standardize community health practice experience and theory may not address students’ learning needs in any of the practice areas. These challenges have been addressed in their study, through an experiential learning approach that focuses on the needs of the learner.

Vesper J. et al. [54] explore the effects of experiential learning in pre-hospital emergency care by nursing students on placement with the Northern Ireland Ambulance Service.

Vidar Melby [55] refer to *The World Health Organization* that developed a weeklong experiential learning event for participants so they could gain experience in how temperature-sensitive products are handled, stored, and distributed throughout the length of the distribution supply chain system. This experiential learning method has enabled par-

ticipants to visit, critically observe, discuss and report on the various components of the cold chain process.

Finally, White K.R. [56] address the issue of how a balance of experiential and didactic learning is essential to develop managers and leaders for early and mid-career positions in the healthcare administration profession. His article suggests pedagogical methods that enhance experiential learning. It also recognizes the need for a renewed focus on diverse experiential learning opportunities, management and preceptor development programs, and graduate program partnerships.

Can experiential learning be assessed?

Fourteen studies were found which addressed this question.

The study of Aukes Leo C. et al. [57] test the expectation that enhanced experiential learning is an effective educational method that encourages personal reflection in medical students. Using a pre post-test follow-up design, the level of the personal reflection ability of an exposure group of first-year medical students participating in a new enhanced experiential learning program was compared to that of a control group of second- and third-year medical students participating in a standard problem-based learning program. Personal reflection was assessed using the Groningen Reflection Ability Scale (GRAS). Students’ growth in reflection was analyzed with multilevel analysis.

After one year, first-year medical students in the exposure group achieved a level of personal reflection comparable to that reached by students of the control group in their third year. This difference in growth of reflection was statistically significant ($p < .001$), with a small effect size (effect size = 0.18). The reflection growth curve of the control group declined slightly in the third year as a function of study time. The conclusion of the study is that enhanced experiential learning has a positive effect on the personal reflection ability of undergraduate medical students.

Bligh J. and Parsell G. [58] highlight as the acquisition of the necessary knowledge, skills and attitudes required for effective interprofessional behavior is

conditional upon a large number of variables, over many of which practitioners may have little control. Planned educational and organizational strategies, research and evaluation are needed to answer the considerable number of questions and issues raised by the report.

The University of Maryland School of Pharmacy has systematically implemented professionalism assessment to establish expectations in experiential learning and to create a mechanism for holding students accountable for professionalism. Cynthia J. Boyle [59] describe their philosophic approach to the development and implementation of these explicit criteria and also review the outcomes of applying these criteria.

In 2001, 3 professionalism criteria were developed and applied to required intermediate and advanced pharmacy practice experiences (APPEs). Students were expected to achieve 100% acceptable ratings to pass the rotations. The criteria were subsequently enhanced and by 2005 applied to all experiential courses. Most students exhibited professional behavior; however, 9 students did not meet the established criteria. Strategies used in remediation and further professional development are discussed in the article. The use of professionalism criteria has promoted a culture of professionalism throughout the School.

For Burnard P. [60] the experiential learning has been as a means of helping students to learn about aspects of nursing. His paper reports an analysis of two language styles identified during a research project that explored nurse tutors' and students' perceptions of experiential learning. twelve nurse tutors and 12 student nurses were interviewed and the transcripts were analysed using a modified grounded theory approach. The aspect of the findings reported in the study is that of the emergence of two 'language styles' used by some of the writers and practitioners in the field of experiential learning. It is suggested that those language styles may form a 'culture isogloss' or barrier between tutors and students.

In another study, Burnard P. [61] interviewed 12 nurse tutors in depth about the way that they defined experiential learning and experiential learning methods. In the paper, those definitions are

compared and contrasted with definitions in the literature and implications for nurse education are identified.

When students were interviewed, they tended to define experiential learning much more in terms of clinical work than did the tutors. This difference of perception highlights, perhaps, the need for tutors and students to work closely together in discussing educational approaches to teaching and learning nursing.

In another article, Burnard [62] has advocated Experiential learning methods for teaching interpersonal skills in nursing courses. Tutors and lecturers are often teaching larger groups of students on Project 2000 courses and this may lead to difficulties in using experiential learning methods. The paper offers two types of structure for using such methods based on the notion of student-facilitation. The paper also highlights the need for experiential learning groups to be evaluated effectively and the learning that takes place in them to be linked to the clinical nursing arena.

Coker P. [63] examined the effects of participation in a 1-week, experiential, hands-on learning program on the critical thinking and clinical reasoning skills of occupational therapy students. A quasi-experimental, nonrandomized pre- and post-test design was used with a sample of 25 students. The students had completed three semesters of didactic lecture coursework in a master's level OT educational program prior to participation in a hands-on therapy program for children with hemiplegic cerebral palsy. Changes in critical thinking and clinical reasoning skills were evaluated using the following dependent measures: Self-Assessment of Clinical Reflection and Reasoning (SACRR) and the California Critical Thinking Skills Test (CCTST). Changes in pretest and posttest scores on the SACRR and the CCTST were statistically significant ($p > 0.05$) following completion of the experiential learning program. This study supports the use of hands-on learning to develop clinical reasoning and critical thinking skills in healthcare students, who face ever more diverse patient populations upon entry-level practice. Further qualitative and quantitative investigations are needed to support the results of this study and determine which components of experi-

ential learning programs are essential for developing clinical reasoning and critical thinking skills in future allied health professionals.

D'Amour R. and Guimond P. [64] report on an evaluation of work-based learning within a post-registration community health nursing degree programme. The purpose of their article is to describe the process utilized to develop, implement, and evaluate a workshop on Creutzfeldt-Jacob disease (CJD) for nurses and other health care providers. Kolb's experiential teaching/learning model was used as a framework for this workshop. A workbook was developed to complement the participants' learning. Fifteen health care providers from the Alzheimer Society of Canada's Dementia Network agreed to participate in this educational project. The results indicated that the participants had limited knowledge about CJD. They felt ill prepared and uncomfortable in providing quality care to this patient population. The workshop generated new insights and knowledge about the disease and the needs of the patients and their families. Participants exchanged ideas for tailored interventions. An experiential teaching/learning model is a highly effective approach to increase knowledge and skills, as well as fostering reflective practice.

Delany C. and Watkin D. [65] describe and examine the effect of a three hour per week, six week critical reflection program, grounded in knowledge paradigms of postmodernism, reflexivity and critical theory, on third year undergraduate physiotherapy students' experience of their first clinical placements. The theoretical basis of the program provides a potential bridge with which to link and broaden the established framework of clinical reasoning theories. Within the program, students' critical reflection discourse focused on notions of power, hierarchies, connecting with others and relationships. Their feedback about the effects of the program highlighted themes of validation and sharing; a break in clinical performance and a broadening of their spheres of knowledge. These themes resonated with students' overall experiences of learning in clinical placements and provide some evidence for the inclusion of critical reflection as a valid and worthwhile component of early clinical education.

Dewar B. J. and Walker E. [66] report on an evalu-

ation of work-based learning within a post registration community health nursing degree programme. Work-based learning is primarily concerned with the process of learning and with encouraging the individual to be explicit about how and what they learn so that their experiential learning may be assessed and accredited. The methodology of Illuminative Evaluation was adopted, with case studies (n=6) used as the means of exploring in depth the different perspectives of the major stakeholders (that is, the students, their workplace supervisors and their academic supervisors). The data comprised documentation, participant and nonparticipant observation, interviews and focus groups. What emerged through the course of inquiry was a gap between the educational philosophy of work-based learning and the way in which work-based learning was delivered within the department concerned. Work-based learning provides educators with an opportunity to debate openly fundamental issues about the nature of educational practice; in particular, about the role of the supervisor in facilitating students' learning. As the evaluation highlights, if this debate does not occur, existing educational practice remains unchanged and the potential benefits to students of this new educational philosophy are not realized. Furthermore, it is by engaging in a reflective process in relation to their own experience that educators can begin to understand how to facilitate that process in others.

Hogg D. C. and Morgan P.J. [67] have gathered students' opinions of the simulator learning experiences and to study and analyze their comments regarding the nature of the learning.

All fourth-year medical students were invited to participate in a simulator session during their anesthesia rotation. A satisfaction survey was administered and the qualitative data were analyzed. A total of 145 students completed the questionnaire (100% return rate). Most students (88%) reported the session to be a positive learning experience that provided opportunities for applying their knowledge in a realistic environment. Some students indicated a lack of comfort in the environment but this did not appear to inhibit performance. Student comments highlighted the value of the learning experience and provided insights into the nature

of the learning. The computer-controlled patient simulator offers new and challenging opportunities for medical students to apply their knowledge and practice working through an Anesthesia case without endangering patient safety.

Evaluation of the effectiveness of the Urinary Incontinence Scales to measure change after student participation in a disability-incontinence experiential learning activity was the focus of the pilot study of Karlowicz K.A. [68]. A comparison between pretest and posttest scores showed a significant increase in Belief and Practice subscale scores after participation in the experience. However, positive correlations between the variables measured could not be established.

Lian-Kah Ti et al. [69] present 2 pilot projects in which the efficacy of experiential learning with simulation is demonstrated. In the first project, groups of 4 to 6 fourth-year medical students were exposed to common crisis scenarios. Each student took turns to individually handle the situation (in the hot seat), while the rest of the group watched "live" via video-link. A group debrief was done after the completion of all scenarios and learning points were discussed. A test was conducted shortly after, and the student who managed the same scenario in the hot seat earlier was compared to the rest of the group with respect to crisis recognition, management and diagnosis. In the second project, 36 fourth-year medical students were assigned to learn endotracheal intubation through a directed or experiential method. Students were recalled after 3 months and tested on 4 major categories: preparation, technique, success and ventilation. Students in the hot seat tended to perform better (72% vs. 64%), and were more likely to be the highest scoring student within their group; although this did not reach statistical significance. For the intubation study, students in the experiential group had a higher success rate at 3 months (78% vs. 41%). Experiential teaching methods with simulation result in better learning of crisis management and endotracheal intubation.

In the study of Wolf M. and Mehl K. [70] the principles of experiential learning, outdoor ropes courses are a means for the facilitation of personal growth and promotion of individual coping skills. A ropes

course intervention was evaluated as an add-on to a psychotherapy inpatient programme. In a diagnostically mixed inpatient sample, participation in ropes course exposures seemed to be related with better long-term outcomes on personality variables - trait anxiety and self-efficacy - but not regarding depressive symptoms and state anxiety. Interventions that draw upon experience and group action might be a valuable addition to talking psychotherapy.

What contextual influences hinder or enable the development of experiential learning?

Four studies were found which addressed this question.

Acosta V. M. [71] offers a perspective on why culturally integrated behaviors are important for allied health education and suggestions of methods to facilitate such behaviors. Literature and theory are used to support cultural integration in allied health curricula. Examples of learning experiences from students in cross-cultural environments and reflections on those experiences further elucidate facilitation methods.

Barrett K. [72] shows a framework for health education based on experiential learning and critical inquiry was developed and applied to a Spring 1990 basic health education class for college students called "Patterns of Healthful Living." Students were asked to consider contemporary health problems and how these affected their own lives and the lives of others.

Green A.J. [73] develops an enquiry from the premise that there is potential for students to learn effectively in experiential teaching sessions. The authors experience of teaching in mental health gave focus to the question as to whether nurse teachers consider, and then use, a particular experiential learning framework when facilitating experiential teaching methods. The enquiry was an individual case study of one nurse teacher, and the data were collected through non-participant observation and focussed, non-directive interviewing. The philosophical perspective and methodology was phenomenological with the data analysed using phenomenological guidelines. This was used as it concentrated on

the nurse teachers understanding of experiential learning as a phenomenon. The results concluded that the nurse teacher had a clear understanding of experiential learning and aspects of her interpretation manifested themselves within the classroom as part of experiential teaching. When compared with the literature there were commonalities with the meaning of experiential learning held by the nurse teacher studied. The focus of this paper is to report briefly on the enquiry, and then offer a detailed critical description and evaluation of the methodological approach used.

Green A.J. and Holloway DG. [74] provide a report of the usage of a phenomenological research methodology to investigate the influence on clinical practice of pre-and post-registration nurse education which makes explicit use of experiential teaching and learning approaches. The primary aim of the research was to explore the use of a phenomenological research methodology to examine the students' understanding of experiential teaching and learning, The claims made for the use of experiential teaching and learning approaches in both pre-and post-registration nurse courses and how clinical practice is influenced by the experiential learning elements of pre-and post-registration nurse education were also examined. The first stage of the enquiry involved focused nondirective interviews with members of BSc Nursing Studies and MSc Mental Health Branch programmes. Both programmes claim to make use of experiential teaching and learning. Previous experiences of experiential teaching and learning were probed, student interpretations differentiated, and the relationship between course-based learning using experiential approaches and the implications for its influence on practice were examined. The second stage of the enquiry has followed up the initial findings, exploring the students' experience of experiential approaches on their courses both in the classroom and in work-based learning situations. The findings are presented and discussed in the context of other studies from both nurse and higher education, Throughout the paper methodological concerns arising are discussed. The paper concludes with the identification of methodological problems arising from the research strategy:

the implications of the power nexus created when teachers research students, and issues relating to the use of a phenomenological methodology in a longitudinal study.

DISCUSSION

In this section, we discuss the current state of research in this area. We summarize the findings briefly and relate the literature to existing models of experiential learning. We also highlight the assumptions and relationships that are not yet supported by research evidence. Lastly, we offer implications for research and for educational practice.

Current state of the research

The research literature on the effectiveness of strategies to foster experiential learning is still in development. We identified 49 studies, the majority of which were qualitative. Comparison groups were sometimes included. At the time of our review, no randomized controlled studies were identified. However, many of the studies employed carefully conceptualized, theoretically-based qualitative methods and analytic approaches.

The methods employed were appropriate to the research questions and led to reasonable estimates of study quality and findings. Qualitative inquiry also informs understanding of theoretical perspectives and models which best seem to inform experiential learning in medical education. Comparative research approaches can be more appropriately utilized once these common understandings have been developed.

That said, the review revealed several carefully developed instruments and analytic approaches for measuring experiential learning. Where these were developed for a specific study, their construction and validation were clearly described, with an appropriate methodologies, mainly with a qualitative research approach and case studies. These instruments can provide a useful steppingstone to further study of experiential learning in medicine.

The experiential learning, as evidenced by papers identified, is used in various fields of medicine: for example, trans-cultural nursing education, in-

ter-professional education, transformation of current practices, empathy in the care of vulnerable older persons, complementary alternative medicines, counseling skills, cardiology, to teach the skills for evidenced-based practice and information literacy in pre-hospital emergency care, to develop managers and leaders for early and mid-career positions in the healthcare administration profession. We can say that experiential learning is seen as a methodology that encourages reflection and promotes the construction of new shared professional knowledge.

From the studies analyzed, then, emerges as the experiential learning is seen as a practice that can be experienced not only in the training of doctors, nurses, educators, but also managers and other professionals working in teams.

Summary of our findings

This literature review allows us to identify certain influential variables that can form the foundation for future studies. It also reveals the gaps in the existing literature, both in content and methodology. However, several illuminating and important findings appear consistently across study designs, study groups and professions. They are summarized below: The focus of education has changed from teaching to learning. This educational model stresses student outcomes that include critical thinking, effective communication, and students' ability to reflect their own learning.

These studies have shown that experiential learning is a methodology that can help practitioners and health care in the new learning and management of emotions connected to clinical practice.

The experiential learning, in fact, gives the subject an active role as builder of knowledge, which is also the result of "exchanges" between him and the surrounding environment.

However, emerging terms such as "experiential learning", "collaborative learning", "critical thinking", "cooperative learning", "reflection" and "reflection practices" that seem to be often used as synonyms. Perhaps we could say that the experiential learning includes all these elements, precisely because it is primarily about learning from experience to reflect

on it, creating new meanings and new professional practices.

A key point that emerges from studies identified for this review of the literature concerns the personal epistemology as an array of professional shift. To change its practices, that is, you need to work on dismantling and restructuring of their own beliefs, attitudes, values, languages, and in a few words on our own systems of social-cognitive construction of reality (social representations).

The next step in the process of building new knowledge involves the "socialization" of these in a "community of practice" [75]. Here, in fact, the experiential learning can play a decisive role, if it manages to turn a negotiation, exchange and restructuring of the "personal knowledge" of each individual practitioner who is part of a "learning community".

Because an experiential teaching / learning model is a highly effective approach to increase knowledge and skills, as well as fostering reflective practice, it is necessary to keep experimenting with new models of experiential learning assessment, which can bring out the critical aspects on which to intervene continually improving levels of intra-group interaction. The aim is to promote the ability to work in inter-professional environments, which direction they are moving all the professional sectors, especially related to medical practice.

Implications for research and practices

The literature synthesis highlights several questions for further study. We raise these questions here.

Does the experiential learning enhance the practices?

All studies show that experiential learning has facilitated the sharing of knowledge and emotions and we have evidence that best practice by experimenting with some models of experiential learning [76]. Unfortunately, there is limited time for reading, meeting with colleagues, or reviewing their own practices. We must continue to creative, efficient, and innovative approaches that change their behavior and help physicians improve the quality of health care [77]. In particular:

- It is critical to continue to measure physician performance;

- changing physician behavior must devolves more than one approach;
- change often occurs within organizations and barriers to change must be understood;
- should approaches to change and reflect, the specific issue to be based on model of physician decision making;
- medical informatics holds great promise, but has an unclear role in the ambulatory setting;
- traditional continuing medical education should be changed.

For Ringsted C. [78] (2009) experiential learning in the learner is highly active in the practices processes through trial and error, whereas in the step-by-step approach takes the learner to more passive role.

White K.R. [79] suggests pedagogical methods that enhance experiential learning. It also recognizes the need for a renewed focus on diverse experiential learning opportunities, management and preceptor development programs, and graduate program partnerships.

Can experiential learning be assessed?

Student evaluations reveal both immediate and long-term effects of this course on graduates' clinical practice [80].

In a recent study of Aukes Leo C. et al. [81] enhanced experiential learning has a positive effect on the personal reflection ability of undergraduate medical students.

D'Amour R. and Guimond P. [82] demonstrate as an experiential teaching/learning model is a highly effective approach to increase knowledge and skills, as well as fostering reflective practice.

Delany C. and Watkin D. [83] provide some evidence for the inclusion of critical reflection as a valid and worthwhile component of early clinical education.

Dewar B. J. and Walker E. [84] report on an evaluation of work-based learning They highlight as it is by engaging in a reflective process in relation to their own experience that educators can begin to understand how to facilitate that process in others.

Lian-Kah Ti et al. [85] demonstrate as experiential teaching methods with simulation result in better learning of crisis management and endotracheal intubation.

Finally, Wolf M. and Mehl K. [86] demonstrate as interventions that draw upon experience and group action might be a valuable addition to psychotherapy. Burnard [87] (1993), however, highlights the need for experiential learning groups to be evaluated effectively and the learning that takes place in them to be linked to the clinical nursing arena.

Further qualitative and quantitative investigations are needed to support the results of the studies and determine which components of experiential learning programs are essential for developing clinical reasoning and critical thinking skills in future allied health professionals.

What contextual influences hinder or enable the development of experiential learning?

We have not found studies that address this topic, but we can draw some general considerations that come from an analysis of material collected for this literature review:

- it is important to foster a climate of mutual trust between professionals within the working group;
- the *tutor* can facilitate group members in developing and sharing their emotions and their own knowledge, it is important that he always gives feedback and show the connections and associations between their thoughts;
- need to educate the group to “cognitive listen” than the other, avoiding to consider empathy as a “subjective variable innate” or, worse, as an element of mere “tolerance” of other person.
- need a “sensitivity” also by the institutions, so that we can implement specific moments dedicated to experiential learning. On the other hand, if an institution believes in a learning approach, this will be understood by the student / professional such as a value assignment. Conversely, if an activity is not enhanced, the tendency of the student / professional will be to regard it as unimportant and “incidental” in comparison to the traditional curriculum.

Conclusion

In this review, we have synthesized the findings of 47 studies of experiential learning in the health professions.

Experiences are now accelerated, fragmented, virtual, often contradictory, no longer transmitted by generation, but through building a creative effort. We need to “do” the experience and what happens when we transform everyday events into learning. It takes the body a different knowledge than those traditionally found in the lexicon of trainers (knowledge, skills, interpersonal skills).

This is the knowledge that comes from experience. Yet, as understanding of experiential learning and develops the field matures, there will be a need for studies with rigorous designs that will allow us to evaluate the effect of different educational strategies to promote its development.

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APPENDIX 1

Appendix 1 Studies included with Abstract

Source	Study design and data collection	Study population and discipline	Study location/ Author location	Sample size	Brief abstract
1) Acosta V. M. (1991)	Qualitative Research using Learning Style Inventory (LSI)	Under-graduate Health Professionals	USA	69	Students were asked to consider contemporary health problems and how these affected their own lives and the lives of others.
2) Aukes Leo C. et al. (2008)	pre and post-test follow-up design	Under-graduate Medicine	USA	184	This study's aim was to test the expectation that enhanced experiential learning is an effective educational method that encourages personal reflection in medical students.
3) Barrett K. (2002)	Qualitative Research	Under-graduate Health Professionals	USA		This article offers a perspective on why culturally integrated behaviors are important for allied health education and suggestions of methods to facilitate such behaviors.
4) Bligh J. and Parsell G. (1999)	Editorial	Under-graduate and Graduate Health Professionals	UK		Acquisition of the necessary knowledge, skills and attitudes required for effective interprofessional behavior is conditional upon a large number of variables, over many of which practitioners may have little control.
5) Boyle Cynthia J. et al. (2007)	Action research	Under-graduate Medicine	USA		The University of Maryland School of Pharmacy has systematically implemented professionalism assessment to establish expectations in experiential learning and to create a mechanism for holding students accountable for professionalism.
6) Burnard P. (1987)	Reflective article	Graduate and under-graduate Health Professionals	Australia		This paper offers an epistemological theory divided into three domains: propositional knowledge, practical knowledge and experiential knowledge, as a basis for a theory of experiential learning.
7) Burnard P. (1991)	Modified Grounded Theory Approach	Under-graduate Nurses	Australia		Experiential learning has been advocated as a means of helping students to learn about aspects of nursing. This paper reports an analysis of two language styles identified during a research project that explored nurse tutors' and students' perceptions of experiential learning.
8) Burnard P. (1992)	Interviews in depth	Graduate Nurses	UK	12	This paper offers some of the findings from a study into nurse tutors' and student nurses' perceptions of experiential learning.

Source	Study design and data collection	Study population and discipline	Study location/ Author location	Sample size	Brief abstract
9) Burnard P. (1993)	Reflective article	Under-graduate Nurses	UK		The paper highlights the need for experiential learning groups to be evaluated effectively and the learning that takes place in them to be linked to the clinical nursing arena.
10) Carpio BA, Majumdar B. (1993)	Reflective article	Under-graduate Nurses	USA		The exploration of personal values is an essential first step in developing cultural awareness in order to move learners beyond ethnocentrism through awareness, understanding, acceptance, and appreciation of other cultures if learners are to truly adopt a multicultural approach to their professional practice.
11) Coker P. (2010)	A quasi-experimental, nonrandomized pre- and post-test design	Under-graduate Occupational Therapy	USA	25	This study examined the effects of participation in a 1-week, experiential, hands-on learning program on the critical thinking and clinical reasoning skills of occupational therapy students.
12) D'Eon M. (2004)	Reflective Article	Graduate and undergraduate Medicine and health professions	Canada		This article examines several approaches to learning that can help IPE (Inter-professional Education) fulfill its expectations.
13) D'Amour R., Guimond P. (2010)	Reflective article	Graduate Health Professionals	Canada		The purpose of this article is to describe the process utilized to develop, implement, and evaluate a workshop on Creutzfeldt-Jacob disease (CJD) for nurses and other health care providers. Kolb's experiential teaching/learning model was used as a framework for this workshop.
14) Delany C., Watkin D. (2009)	Interpretive research design drawing from the methodological standpoint of interpretivism, and the related method of constructivism	Under-graduate Health Professionals	The Netherlands		This paper describes and examines the effect of a three hour per week, six week critical reflection program, grounded in knowledge paradigms of postmodernism, reflexivity and critical theory, on third year undergraduate physiotherapy students' experience of their first clinical placements.
15) Dewar B. J. and Walker E. (1999)	case studies	Graduate Nurses	UK		This paper reports on an evaluation of work-based learning within a post-registration community health nursing degree programme.

Source	Study design and data collection	Study population and discipline	Study location/ Author location	Sample size	Brief abstract
16) Gaby C. Jacobs (2008)	Qualitative case-study approach	Graduate Health Professionals	USA		In this paper, the process and outcomes of reflection as experienced and described by the practitioners in the action learning programme, are discussed against the background of notions of reflection and reflexivity, critical being and critical pedagogy.
17) Glendon K., Ulrich D.L. (1997)	Qualitative research	Under-graduate Health Professionals			This article describes "unfolding cases," a comprehensive plan of learning that allows student practice time to solve individually and collectively problems they may encounter in clinical situations.
18) Green A.J. (1995)	Phenomenological with the data analyzed using phenomenological guidelines.	Graduate Nurses	UK		This enquiry has developed from the premise that there is potential for students to learn effectively in experiential teaching sessions.
19) Green A.J. and Holloway DG. (1997)	phenomenological research technique	Under-graduate Nurses	UK		This paper provides a report of the usage of a phenomenological research methodology to investigate the influence on clinical practice of pre- and post-registration nurse education which makes explicit use of experiential teaching and learning approaches.
20) Grof R. (1997)	Qualitative research	Physicians, nurses, and paramedics	Netherlands		This paper aims to provide an overview of some of the theoretical approaches to change and to integrate these approaches into a more general framework for changing clinical practice. The emphasis will be on changing the clinical practice of doctors and not on improving hospital management.
21) Hammer D. (2006)	Reflective article	Under-graduate Medicine	USA		The purpose of this paper is to serve as a tool for preceptors to aid in pharmacy students' development of professionalism.
22) Hewson Mariana G. et al. (2006)	randomized controlled study	Graduate Medicine	USA	48	We developed and implemented a professional development program involving experiential learning and conceptual change teaching approaches.
23) Hogg Doreen Cleave & Morgan Pamela J. (2002)	Qualitative research (satisfaction survey)	Under-graduate Medicine	Canada	145	The purpose of this study was to gather students' opinions of the simulator learning experiences and to study and analyze their comments regarding the nature of the learning.
24) Howard Bauchner et al. (2001)	Reflective Article	Graduate Medicine	USA		We must continue to create, efficient, and innovative approaches that help physicians change their behavior and improve the quality of health care.

Source	Study design and data collection	Study population and discipline	Study location/ Author location	Sample size	Brief abstract
25) Ikemi A., Masui T. (1984)	Qualitative research	Under-graduate Medicine	Japan		The authors discuss the need for experimental courses for medical students to overcome the Cartesian view of seeing others as “objects” and for developing humanistic ways of relating to other persons.
26) Jarvis P. (1992)	Reflective article	Graduate and under-graduate Health Professionals	UK		This paper lays the foundations for a theory of practice and paves the way for one useful way in which the relationship between theory and practice can be understood.
27) Karlowicz K.A. (2009)	Quantitative research	Under-graduate Nurses	USA		Evaluation of the effectiveness of the Urinary Incontinence Scales to measure change after student participation in a disability-incontinence experiential learning activity was the focus of this pilot study.
28) Kidd T. and Kendall S. (2005)	Literature review	Under-graduate and Graduate Health Professionals	UK		This paper examines issues of contention regarding current practices and suggests the application of the experiential theory of learning (incorporating reflective practice) to advanced cardiac life support (ACLS) training.
29) Kinyon J., Keith C.B., Pistole M.C. (2009)	Action-Research	Under-graduate Nurses	USA		This article describes an interdisciplinary, group experiential learning approach used with baccalaureate nursing students as group participants and graduate counseling psychology students as facilitators.
30) Kolb, D.A. (1984)	Qualitative study	Graduate Under-graduate All the professionals	USA		Kolbs' Experiential Learning Model.
31) Lian-Kah Ti et al. (2009)	Statistical research (SPSS Version 15.0)	Under-graduate Medicine	Singapore	224	Simulators provide an effective platform for the learning of clinical motor skills such as endotracheal intubation, although the optimal learning technique remains unidentified.
32) Lian-Kah Ti et al. (2006)	Simulation	Under-graduate Medicine	Singapore		It present 2 pilot projects in which the efficacy of experiential learning with simulation is demonstrated.
33) Linus Vanlaere et al. (2010)	Qualitative research (simulation)	Graduate Nurses			To generate empathy in the care of vulnerable older persons requires care providers to reflect critically on their care practices. Ethics education and training must provide them with tools to accomplish such critical reflection.

Source	Study design and data collection	Study population and discipline	Study location/ Author location	Sample size	Brief abstract
34) Lockhart J.S., Resick L.K. (1997)	Reflective article	Under-graduate Nurses	UK		An undergraduate course in transcultural nursing is described that relies heavily on experiential learning activities and local community resources.
35) Mander R. (1992)	Qualitative research (semi-structured interview Format)	Graduate Nurses and Midwives	UK		The contribution of experience to learning is examined in relation to data collected during a study of midwives' care of relinquishing mothers.
36) Papai P., Bourbonnais F.F., Chevrier J. (1999)	Kolb's experiential learning model	Graduate Nurses	USA		Kolb's experiential learning model was used as a framework to help Chinese nurse educators reflect on their practice as clinical teachers.
37) Phillips R.M., Bonsteel S.H. (2010)	Qualitative research	Under-graduate Nurses			The authors describe the development and implementation of simple research projects in an undergraduate nursing research course and the collaboration among course faculty, nursing students, and the information literacy specialist.
38) Pugsley K.E, Clayton L.H. (2003)	Reflective article	Under-graduate Nurses	USA		In an attempt to excite baccalaureate nursing students about nursing research, a traditional, lecture-style nursing research course was transformed into an experiential, interactive course.
39) Ringsted C. (2009)	Reflective article	Under-graduate and Graduate Health Professionals	UK		In experiential learning the learner is highly active in these processes through trial and error practice, whereas in the step-by-step approach the learner takes a more passive role.
40) Sewchuk D.H. (2005)	Kolb's experiential learning theory and learning cycle	Under-graduate Nurses	USA		A perioperative nursing course that uses Kolb's experiential learning theory and learning cycle as a framework was developed to provide nurses new to the OR with a solid knowledge base with which to further their practice.
41) Simpson K, Freeman R. (2004)	Reflective article	Graduate Dentist	UK		The models of reflective practice and experiential learning, described within this article, provide the dental practitioner and his/her team with realistic methods by which they can improve their skills and working atmosphere, and also reduce occupational stress.

Source	Study design and data collection	Study population and discipline	Study location/ Author location	Sample size	Brief abstract
42) Smith L.M., Emmett H.E., Woods M. (2008)	Reflective Article	Under-graduate Nurses	Tasmania		An experiential learning approach that focuses on the needs of the learner.
43) Vesper J. et al. (2010)	Qualitative research (Questionnaires and focus groups)	participants from the global pharmaceutical industry, health care providers, national regulatory authorities, and suppliers/vendors	Turkey		This experiential learning method enabled participants to visit, critically observe, discuss and report on the various components of the cold chain process.
44) Vidar Melby (2000)	Qualitative research (diaries and focus group interviews)	Graduate Nurses	UK	141	Explore the effects of experiential learning in pre-hospital emergency care by nursing students on placement with the Northern Ireland Ambulance Service.
45) Wallace D. (1996)	Qualitative research (ethnographic study)	Graduate Nurses	UK		This article describes a continuing ethnographic study of critical thinking, reflection and experiential learning in nursing.
46) White K.R. (2002)	Reflective article	Graduate Health Professionals	USA		This article suggests pedagogical methods that enhance experiential learning. It also recognizes the need for a renewed focus on diverse experiential learning opportunities, management and preceptor development programs, and graduate program partnerships.
47) Wolf M. and Mehl K. (2011)	The high-rope evaluation study is a prospective naturalistic study with a non-equivalent control group design	Patients	USA	247	A controlled study was conducted to investigate the effectiveness of high-ropes exposures as an add-on to inpatient treatment in a naturalistic setting.