IJAHSP

Internet Journal of Allied Health Sciences and Practice

Volume 14 | Number 4 Article 7

October 2016

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This commentary is available in Internet Journal of Allied Health Sciences and Practice:
https://nsuworks.nova.edu/ijahsp/vol14/iss4/7

IJAHSP™
The Internet Journal of Allied Health Sciences and Practice
Dedicated to allied health professional practice and education
Vol. 14 No. 4 ISSN 1540-580X

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ABSTRACT

Development of professional expertise is the transition from novice to expert within a profession through deliberate practice with feedback. While this development is actively stimulated during undergraduate studies, encouraging practicing healthcare professionals to pursue their development towards expertise does not seem as obvious. This commentary briefly describes the development of professional expertise and the possible decline in performance that can occur with time. It then gives insight into the roles of continuing professional education in healthcare practitioners' acquisition and maintenance of professional expertise.

BACKGROUND

Development of professional expertise is the gradual transition from novice to expert practice within a profession. It is a process of progressively and continuously transforming a repository of knowledge, skills, and attitudes resulting in consistent improvement in professional performance in a specific domain. Development of professional expertise has been studied in many health professions, widely inspired by both the Dreyfus five-stage model of skill acquisition and by Ericsson's experts' exceptional performance approach.[1,2] The Dreyfus model shed light on how experiential learning develops and gave educators insight into the steps the future healthcare practitioners go through during their training years and during their post-training professional career. Dreyfus and Dreyfus have studied the skill-acquisition process of airplane pilots, chess players, automobile drivers, and adult learners of a second language. They have found a common pattern which is the origin of their five-stage model of skill acquisition: 1) the novice performer follows learned "context-free" rules with much concentration, 2) the advanced beginner (also called intermediate) begins to use experience and situational elements when performing, 3) the competent performer sees a situation as a set of facts and plans work with a goal in mind, 4) the proficient performer is deeply involved in his/her task, rapidly recognizing patterns but still thinks analytically about what to do, and 5) the expert performer acts intuitively and relies on mature and practiced understanding.[1] After the work of Benner in nursing, this model was later adapted to many health sciences.[3] In order to highlight the time of entry into a profession, this five-step model can also be divided in two parts, in which 1) students progress through the novice, advanced beginner, and competent levels –the latter being the certification level– and, 2) in which new healthcare practitioners continue to progress from the competent level to the proficiency stage, and then ideally to the expert level.[4]

Ericsson's expert performance approach assumes "that acquisition of expert performance requires engagement in deliberate practice and that continued deliberate practice is necessary for maintenance of many types of professional performance."[5] Deliberate practice consists of individualized training activities designed to improve specific aspects of an individual's performance through repetition, feedback, and successive refinement.[6] Multiple methods are used to get students engaged in deliberate practice during their professional training years. Interactive and realistic methods such as simulations, hands-on labs, workshops, and information technology platforms allow students to practice their skills and clinical reasoning abilities in a controlled, risk-free environment.[7,8] Students also receive appropriate feedback, which then encourages them to repeat clinical tasks in order to improve their performance. While it is easy to conceive that professional development is actively fostered in health science education, it is more difficult to figure out how healthcare practitioners can be encouraged as they progress toward expertise. Most professionals reach an acceptable and stable level of performance within a limited period of time. As their behaviors are adapted to the performance demands, they become increasingly automated. The key challenge is to avoid the

arrested development associated with automaticity and to acquire cognitive skills to support continued improvement. Expert performance and continued learning are mediated by complex mechanisms of monitoring, planning, and analyses of performance. The experts deliberately construct and seek out training situations in which the desired goal exceeds their current level of performance.[5] This commentary aims to give some insight into how the development of professional expertise can be fostered throughout the professional career.

MAINTENANCE OF PERFORMANCE

Continued practice during one's professional career is capital for maintaining a high level of performance.[9] Under some circumstances, a healthcare practitioner may become less proficient and drop to a lower phase of learning, then having to re-ascend up the professional development levels.[10] Age-related decay in healthcare practitioners' skills has been identified to be of concern for the population's safety. [11,12] Eva reviewed many studies showing a negative relationship between age and performance in medicine.[11] Healthcare practitioners' skill decay can be viewed as breakdowns in the clinical reasoning processes; it could either be a loss of skills from a prior baseline or the stasis of skills in the face of constantly changing professional and scientific knowledge over time.[12] An inverse relationship between age and performance seems to be a paradox, given the emphasis most educators put on experience. It could be that practitioners are less likely to keep up-to-date with current knowledge. Another explanation may emerge from the dual-process theory of reasoning. Clinical reasoning is often seen as interactions between two systems: non-analytical or intuitive reasoning and analytical reasoning. Non-analytical reasoning (e.g. pattern recognition) consists of unconsciously and automatically making links between a given clinical situation and patterns stored in the long-term memory, allowing the formulation of diagnostic hypotheses very quickly. It is described as intuitive, tacit, and experiential. Analytical reasoning (e.g. hypothetico-deduction) comes from a rational and deliberate judgment based on actively collected information and on the conscious application of rules. Most of the time, pattern recognition allows healthcare practitioners to formulate diagnoses and management options intuitively and rapidly. These diagnoses and options will be confirmed or ruled out analytically through a hypothetico-deductive process.[13] It appears that older practitioners rely more on non-analytical, intuitive reasoning.[11,13,14] Yet, relying on one's prior experience may reduce the tendency to critically incorporate new conflicting information while solving a problem.[12] Non-analytical reasoning can also, to some degree, compensate for failure to keep up-to-date with current knowledge.[15] According to Ericsson, age-related decline in professional performance is usually mediated by reduced engagement in practice.[9] Once experienced healthcare professionals' performance reaches automaticity, they lose conscious control and no longer make specific intentional adjustments.[5] What can continuing professional education providers do to foster professional expertise development and to prevent –or reverse– age-related skill decline?

EFFECTIVE CONTINUING PROFESSIONAL EDUCATION

Continuing professional education obviously aims to improve healthcare practitioners' performance and patient health outcomes. Two recent reviews have shown that these goals are usually achieved and that some educational methods are more effective than others.[16,17] Moore has proposed that, to be effective, continuing professional education providers should consider the five practitioners' stages of learning, which he identifies as: 1) recognizing an opportunity for learning, 2) searching for resources for learning, 3) engaging in learning, 4) trying out what was learned, and 5) incorporating that knowledge.[18] However, continuing professional education providers typically assume that practitioners who enroll in a continuing professional education are at the stage of engaging in learning (stage 3), primarily needing information. Unfortunately, this is not necessarily the case. For example, practitioners in stages 4 and 5 will benefit, respectively, from an opportunity to apply what they have learned and from resources showing them how to integrate new approaches into their own practice. Healthcare professionals are more prone to change their practice if they realize that it does not match with other practitioners in their area or it is not of acceptable professional standards.[19] Shojania et al. suggest that continuing professional education providers could offer sessions that show participants how to identify quality gaps in their practice.[20] Examples of such sessions include presentation of data describing current performance, presentation of guidelines or standards of care, and panel discussion to identify factors contributing to the difference between current and desired performance.[19] Opportunities for self-directed learning should also be proposed in order to enhance the knowledge and skills required for critical reflection on practice and measurement of improvement.[21]

What Works Best?

It is now recognized that traditional continuing education alone, such as lectures (didactic sessions) and distribution of printed material, are unlikely to change professional practices.[15,21,22] Healthcare practitioners are more likely to learn and change their practices if they engage in learning activities focusing on clinical problems closely resembling the setting in which they will use the learning and on outcomes that they consider important.[16,18] As during undergraduate studies, interactive methods such as case discussions, hands-on training, role-playing, workshops, and simulations are more likely to be effective for several reasons.[16,18,21-23] Among others, they provide an opportunity for practice and feedback, which are both essential for learning and transferring learning into action.[5,6,18] Using multiple and sequenced activities also leads to greater improvement in practitioner performance and patient outcomes.[12,16,18,21,22] Finally, reinforcing activities such as sending course handouts, practice guidelines,

summarized information, or reminders to participants after a continuing education activity may foster knowledge transfer into practice. Post-course evaluations with case studies that emphasize the key points of an activity may as well contribute to changing practices.[19]

CONCLUSION

Engagement in deliberate practice is essential to achieve and maintain expertise, but it takes time and motivation.[18,24] In order to prevent skill decay, continuing education activities should be adapted to the audience, taking into account the various stages of learning and levels of professional development.[10,12] Active learning and feedback are key factors for effective transfer into practice.

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