

the teacher to prepare. Once prepared, the teacher gains confidence. The educator begins to appreciate his or her own abilities and becomes eager to improve further. Peer-to-peer support strategies accomplish this when promoting a culture of continuous improvement. What better way of achieving faculty

development can there be but to inspire joy in our teachers and, in turn, our learners?

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Learning through the senses

Marieke van der Schaaf 

Everyone who rides a bicycle or plays music will experience that such tasks demand more than a cognitive process; the body seems able to process and even ‘remember’ knowledge and skills that cannot easily be reasoned and explained. In the paper ‘Body pedagogics: embodied learning for the health professions’, Kelly et al.¹ make a well-founded argument regarding how embodiment is central in the actions of health professionals. They offer examples of how senses and bodily

movements interact with the environment and feed expertise development. In doing so, they highlight a lack of attention to embodiment in health professions education and suggest filling this gap by means of ‘body pedagogics’ (i.e. ‘the central pedagogic *means* through which a culture seeks to transmit its main corporeal techniques, skills and dispositions, the embodied *experiences* associated with acquiring or failing to acquire these attributes, and the actual embodied *changes* resulting from this process’²). This argument follows from the last decade’s increased interest in embodied cognition within the learning sciences. In that broader literature, embodied cognition describes a spectrum of theories that view learning, and human cognition in general, as driven by a body’s interactions with the environment.³

If bodily sensations are key to learning in the health professions, the development of learning environments that support embodiment may benefit from insights developed through the educational sciences. It is important,

for example, that we avoid overloading a curriculum with activities that stimulate the senses without leading to learning. Activating learners by having them use gestures that do not facilitate learning will only provide extra load on learning processes without yielding the desired benefits. Although the authors explain the importance of sensory learning and provide many clear examples, the concept remains rather implicit in terms of what learning is and how learning takes place. To add to that representation, therefore, we use the taxonomy of embodied cognition put forward by Shapiro⁴ to explain three main accounts of embodied cognition in an attempt to take a position regarding how the concept of embodied cognition can benefit health professionals’ learning and learning environments.

The first account of embodied cognition treats all perceptions, actions and cognitions as occurring from how learners experience and conceptualise their environment, with the experience and conceptualisation being co-determined by the nature of the

Center for Research and Development of Education, University Medical Center Utrecht, Utrecht, the Netherlands

Correspondence: Marieke van der Schaaf, Center for Research and Development of Education, University Medical Center Utrecht, Utrecht, the Netherlands.
Tel: 00 31 6 2571 0537;
E-mail: m.f.vanderschaaf-5@umcutrecht.nl

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human body (e.g. the way we use our eyes, see, smell, touch). Shapiro calls this the *conceptualisation account* of embodied cognition, stating that concepts arise from physical experiences rather than beginning with the acquisition of cognitive knowledge. It seems that Kelly et al.¹ embrace this account, following Shilling² in their explanation of *body pedagogics*, by referring to: (i) institutional means (i.e. the context that mediates embodied experiences); (ii) embodied experience, and (iii) embodied outcomes.

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In the second account, embodied cognition includes the idea that cognition is a dynamic interaction between brain, body and the world. Shapiro calls this the *replacement account* because the notion of mental representations is replaced by dynamic interactions in which learning occurs fully through the connection between body and world.⁵ In this view, health professionals do not make (static) representations in their mind, but shape their learning in the workplace based on motion or dynamic interaction. From a dynamic systems perspective, learning has been described as a reinforcement of associative relationships. The pattern and strength of these relationships are hardly accessible for conscious control and are heavily driven by chance and predictions. This model

can be hard to appreciate in health professions education because learning is often focused on consciously seeking particular observations when explicitly analysing, diagnosing and assigning meaning and interpretations. However, there are several examples of studies and educational designs that show how learning can be developed by internalisation of sensorimotor actions, without making cognitive representations.^{6,7}

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Finally, several proponents of embodied cognition take the notion a step further still in what Shapiro calls a *constitutional discussion*, also known as the 'extended mind thesis'.⁸ This account follows the idea that the mind is distributed in the surrounding context. For instance, the use of paper and pencil to take notes to remember things can be seen as an enlargement of the cognitive process and makes the environment (i.e. the notes) a component of cognition. From a radical perspective, this implies that if the environment has a (extended) function that is considered to facilitate cognition, that part of the environment should be considered as cognition as well. A milder perspective assumes that the purpose of constitution is not to distribute cognition in an outer world, but to provide insight into how interactions between brain, body and world take place. After all, cognitions are always a bodily human construction and interpretation, rather than an objective reflection of reality. Both constitutional perspectives imply that learners need opportunities to discover, practise and refine their senses.

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In conclusion, the concept of body pedagogics indicates a need to deliberately attend to and improve health professionals' learning environments, but it also necessitates that underlying notions about learning are made clear. Learning, after all, does not automatically take place when learners carry out bodily activities or mimic the bodily movements of their supervisor. Neither does adopting the concept of embodied cognition imply that all learning should be based on body pedagogics. Shapiro's notions of conceptualisation, replacement and constitution may add to positions about learning and learning environments.

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These concepts may become increasingly important as today's multimedia learning environments and robotics offer opportunities for further development of embodiment and body pedagogics.^{9,10} To bring this field forward, a corresponding research programme is needed that may pre-eminently be phenomenological and multidisciplinary in nature. The programme should be driven strongly by learning theory to gain insight into how bodily actions, perceptions and cognitions are related to each other and how embodied expertise can be enhanced in health professions education.

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Towards a greater understanding of narrative data on trainee performance

Catherine Elizabeth Scarff 

In a research paper in this issue of *Medical Education*, Wilby et al.¹ present a study on the interpretation of narrative data generated by assessors in a final-year objective structured clinical examination (OSCE) for pharmacy students in Qatar. The authors collated the written comments on the performances of a sample of nine students (of good, average and poor performance standards) across all six of the OSCE stations and enlisted expert assessors to review them, using think-aloud procedures and verbal protocol

analysis.¹ The overall purpose was to explore how expert assessors understand the narratives written by others in the setting of a standardised performance assessment or, in other words, how we seek to reconstruct a learner’s unwitnessed performance based on descriptions provided by others.

The authors¹ note that narrative assessment data are used increasingly across many assessment formats. They and others note the value of this type of information in terms of its ability to both contextualise numerical data² and go further, providing useful information beyond the confines of ratings to offer a more global view of the trainee’s performance.³ Although some trainees may prefer comments to ratings,⁴ each method has its strengths and weaknesses. For example, some studies have shown that qualitative data can reveal

increases in numbers of poor performers compared with quantitative data⁵ and that such data are less susceptible to issues such as grade inflation.⁶ However, the work required to provide such narrative data and to communicate these data to the learner is not insignificant, and cognitive, motivational and normative influences are relevant.

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The human resources appraisal literature reminds us of the profound difference between ticking a box to reflect the level of an individual’s performance and actually composing text about it.⁷ Elsewhere, the significant cognitive workload in the OSCE setting in particular has been noted.⁸ Within the

Department of Medical Education, Melbourne Medical School, University of Melbourne, Parkville, Victoria, Australia

Correspondence: Catherine Elizabeth Scarff, Department of Medical Education, Melbourne Medical School, University of Melbourne, Room E728, Level 7 East Medical Building, Grattan Street, Parkville, Victoria 3010, Australia.
Tel: 00 61 3 9035 3270;
E-mail: scarffc@student.unimelb.edu.au

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