







Formation of professionalism: A courtship between academic staff and prospective clinical associates



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Background: The study was conducted to the background of a qualification in medical clinical practice offered at a Faculty of Health Sciences at a university in South Africa.

Aim: The aim of the study was to determine how the theory of Whole Brain® thinking informed our professionalism and its relevance to transforming self and practice.

Setting: The study was conducted in the context of a higher education institution, the University of Pretoria. The focus is specifically on the Bachelor of Clinical Medical Practice (BCMP). It has been offered since 2009.

Methods: Participatory action research was the design of choice. The participatory part culminated in working as a collective in a scholarly community of practice. What is reported is the use of the Herrmann Brain Dominance Instrument® (HBDI®) as a research instrument. It was used to determine the thinking preferences of the lecturers. Each lecturer obtained their brain profile that served as baseline data for self-study in the future. The profiling revealed their strengths and areas that they needed to work on – as individuals and as a team.

Results: The theory of Whole Brain® thinking was identified as an enabler towards transforming self and practice. This transformation involved both lecturers and prospective clinical associates.

Conclusion: The value of the study mainly lies in the development of the professionalism of the lecturers. Linked to professionalism is the value of using the theory of Whole Brain® thinking that primarily informed the teaching practice of the lecturers. And secondary to this, the students' authentic clinical practice, which included patients and simulated practice where peers act as patients. The study contributed to the scholarship of teaching and learning in a medical clinical context and to participatory action research – both interrogated from a Whole Brain® perspective for the first time in the context in question.

Keywords: clinical associates; early-career academics; participatory action research; professionalism; scholarly community of practice; scholarship of teaching and learning (SoTL); self-study; thinking preferences; Whole Brain® thinking.

Introduction

This article has been written from a value perspective. What we value as academic staff in relation to our lecturer and scholar identity formation resonates with values stipulated by the University of Pretoria.¹ Three layers of value can be identified.¹ Firstly, the social value of the study that is called the ethnographic^{2,3} value, constitutes a scholarly community of practice with continuous professional development as aim. The idea of a community of practice was initiated by a group of lecturers teaching first-year students enrolled in the Bachelor of Clinical Medical Practice (BCMP). The programme resides in the Department of Family Medicine in the Faculty of Health Sciences at the University of Pretoria. Members of the Department of Family Medicine responsible for first-year modules decided to engage with educational professional development opportunities they have initiated themselves.⁴ Different initiatives have been given life since the introduction of the qualification in 2009. Communities of practice were formed to respond to some of the initiatives. For our sub-projects that form part of an overarching project, the authors opted for using the construct 'scholarly community of practice' as suggested by Fringe⁵ instead of *community of practice* that is commonly used. Our projects are initiative driven opposed to problem driven.

Secondly, the social/ethnographic value relates to the reciprocal learning that enriches the professionalism of both the prospective clinical associates and lecturers. It entails learning from

one another. As lecturers we learn from one another and from our students. Our students learn from us and their peers.

Our scholarship of teaching and learning (SoTL) – so-called scientific value – extends to authentic real-life settings. The authors follow a scholarly approach to our teaching practice. By using a scholarly lens to investigate practice, they are able continuously to construct living theory, following Whitehead⁶ and Huxtable and Whitehead.⁷ The action research design is aligned with our approach to scholarship development. Our aim was to act as role models of being transformational when it concerns our teaching practice – thus creating exemplary practices. More often than not scholars use constructs such as *best-practice* and *evidence-based practice*. Fitting our article and context best is the reference to evidence-based practice in both teacher education and the health care sector by Diery et al.⁸ They highlighted the importance of improving patients' well-being by integrating clinical expertise with the best available clinical evidence. This is extrapolated to our context with the first-year students and their clinical skills practice. Moreover, it is extrapolated to our teaching practice: teaching expertise has been integrated with the best evidence of student well-being.

Creating a culture of well-being includes lecturer well-being. Part of well-being is self-awareness. We used a single questionnaire – the Herrmann Brain Dominance Instrument® (HBDI®)⁹ – as a research method and a means to identify a single aspect of wellness. The instrument identifies an individual's preferences for modes of thinking. Being aware of one's thinking preferences is emancipatory. Being aware of the thinking preferences of members of a team such as a scholarly community of practice enriches one's SoTL. Thinking preferences are integral to well-being and well-being integral to lecturer-identity and clinical associate-identity formation.

We question the insight the higher education community, including ourselves, have about the use of the principles of contemporary learning theories in our teaching practice. For example, the notion of best practice in teaching in higher education is continually under scrutiny by scholars such as Zabalza Beraza¹⁰ and Fook.¹¹ These scholars seem to have a constructivist view of what best teaching practice entails. However, other scholars of higher education such as Bidabadi et al.¹² sketch a very faded picture of what best practice means. They advocate using learning theories that will promote self-regulated and independent students, following a student-centred approach. Amongst other constructs that complement being and becoming an independent thinker, they refer to *metacognition*. This essential construct, *metacognition*, is then blurred when they add the construct *training* – metacognitive training. How would one train a one-sided lecturer-centred approach, to have students become knowledgeable about metacognition and have them use the principles if the principles of metacognition are negated within the learning process? At face value, this paradox shouts betrayal. Furthermore, Bidabadi, Isfahani,

Rouhollahi and Khalili¹² referred to using conceptual maps to promote student centredness and quote an interviewee who was open to making public his or her (best) practice, stating that he or she always first gives a '5 to 10 min summary of the last topic to students if possible, and then build up the new lesson upon the previous one'. The authors consider the construct *lecture* as appropriate to university teaching instead of lesson. They would think that a constructivist approach should complement metacognition. This revelation by the interviewee indicated that a lecturer-centred approach was followed – what could have been done by the students themselves was now being done on their behalf. In this way, the value of metacognition becomes redundant. In our view, this is a perfect example of what best practice is not, cannot and should not be. Furthermore, the question arises: Is the construct *best practice* the best? Should we not agree with the given discourse, the question is: What is our stance?

What is reported is only a fraction of the sub-project on the thinking preferences of the lecturers. The theory on Whole Brain® thinking^{9,13,14,15} is briefly introduced. The instrument that complements the research is the HBDI®.⁹ Apart from other learning theories this theory forms the epicentre of most of the sub-projects we are currently conducting or projects that are being conceptualised or planned. Whole Brain® thinking is one of the learning theories used in our teaching practice and research and is included in the construct frame.

The purpose of conducting this research is consequently briefly highlighted.

Aim

It is common in traditional research that a research problem that serves as a point of departure for a research project is identified. The authors opted for a different way of commencing with conducting research projects. They came across innovative ideas that they wanted to 'try out', as McNiff¹⁶ suggested. Instead of engaging a research problem as a point of departure, we engaged an 'innovative research idea'.¹⁷

As a group of scholars they engage with an innovative idea and experiment with the idea. Action research^{16,18} fits this way of thinking. As implementing a new idea is experimental and more often than not intuitive, it was realised that our research design would complement our stance. Participatory action research creates a sense of allowing for spontaneity and fluidness that McNiff and Whitehead¹⁹ refer to. In order to activate our enquiry minds, the authors opted for formulating inquiry statements instead of research questions. What the authors wanted to explore from the commencement of this project is stated next.

This study provides an insight into different modes of thinking, using the HBDI®⁹ as diagnostic means can be used to enrich and sustain our transformational teaching practice construct frame.

Consequently, the construct frame that pertains to teaching and learning has been outlined. However, the outline is not rigid, boxing in our thoughts and insight, but rather streams throughout our scholarly discourse, allowing the reader to construct their own frame of mind.

Construct frame

It is common to find reference to theoretical or conceptual frameworks in traditional research. The epistemological grounding of our discourse is constructivism. Therefore, using *construct frame* as sub-heading makes sense. The construct *Whole Brain® thinking*^{9,13,14,15} forms the epicentre of our study and discourse. The new meaning that has been constructed, thus far and the daily meaning making are in line with the thinking of De Boer and her co-workers¹⁵ and Smit²⁰ who use the construct *Whole Brain® constructivism*. The authors have added *epistemology* to this construct. It is rich in meaning: *Whole Brain® constructivist epistemology*. Other constructs are derived from the respective learning theories. Important constructs pertaining to our developing professionalism are *self-regulated professional learning*,²⁰ *modes of thinking*,^{9,13,14,15} *self-empowerment*¹⁷ and *living theory*.^{6,7} The authors construct meaning where insight or new meaning is absent in discourse on transforming teaching practice or transforming educational research. The absence is apparent in relevant discourse platforms such as conferences and scholarly publications.

Action learning^{21,22} is employed by the students whilst we conduct action research. Action learning promotes attributes such as confidence, resilience, conflict resolution, team work, self-empowerment, leadership skills, self-efficacy, critical thinking and problem solving. These attributes that Masango-Muzindutsi et al.²² advocated are in alignment with our discourse. This alignment accentuates the alignment between, *inter alia*, action learning, metacognition, self-regulated learning and reflexivity that is visible in the use of principles that are closely related. All of these notions of quality learning expect students and/or professionals to plan, execute the plan, observe what is happening and reflect on the process and the outcome. In this way, individuals enable themselves to re-plan for innovation and transformation.

As we advocate transformational practice as part of our professionalism, we expect our students to become transformational clinical associates – professionals in their own right and own context. As we promote a student-centred approach in our authentic teaching practice, we expect our students to advance a patient-centred approach in authentic clinical settings. Moreover, we advocate a Whole Brain® approach^{9,13,14,15} to both student and patient contexts. This study is the first of its kind in a clinical associate professional development setting at national and international levels. It is innovative in its use of the principles of preferences for different modes of thinking to transform both teaching and clinical practice. The transformation is established as Whole Brain® teaching practice and Whole Brain® clinical practice. Moreover, the study is innovative

insofar as the same principles enrich action research and participatory action research. New meaning making gave birth to constructs coined by Du Toit (cited in Smit),²⁰ such as Whole Brain® action research (WBAR) and Whole Brain® participatory action research (WBPARG).

The authors have constructed a new meaning of best practice, based on new insight gained whilst engaging with literature, taking part in discourse on the subject and contemplating their practice. During our deliberations the authors came to realise that best is not good enough. We contemplated constructs such as Whole Brain® facilitating of learning and Whole Brain® assessment. These constructs suggested innovative and transformational thinking about teaching practice. Our living theory^{6,7} lens allowed us continuously to construct new meaning. A dynamic process of meaning making emerged based on our lived, authentic experiences. Constructs such as cutting-edge started to surface. It was soon realised that the authors cannot claim to be cutting-edge academics because the infrastructure such as the laboratories used for the purpose of mastering clinical skills may not complement such a view of self.

Our meaning making became a Whole Brain® process in itself – in our view a transformational process. Our teaching practice gradually was transformed by using the principles of Whole Brain® thinking. Similarly, the authors expect their students to become Whole Brain® meaning makers. As prospective professionals they have to make meaning of what a transformed clinical practice entails. As the authors form an integral part of their teaching practice and students of their clinical practice, the transformational intent is focused on an intra-, inter-personal and a structural dimension. The latter includes managerial and administrative dimensions of practice that are distinct to teaching or clinical practice. The intrapersonal dimension refers to the self – the one that needs to be transformed.²³ The interpersonal relates to the members of the community of practice who are equally responsible for one another's transformation. As individual professionals, the authors transformed their own practice – what one does when being on one's own with students. Students transform the self and own practice – when being on their own with patients and being part of a multidisciplinary team. As scholars of teaching and learning, the authors form a community of practice; as a group of 'clinical associates', students form communities of practice as Li et al.²⁴ highlighted and as a collective, they transform the curriculum with the input of the students and based on what they learn from them. Our insight into what curriculum entails is beyond the traditional view of curriculum as being a structured content-driven plan. In our view, a content-focused curriculum is an oversimplification of a complex construct. Therefore, we appreciate the work performed by Hicks.²⁵ From this study, we learn that our meaning making of what curriculum constitutes is neither simple nor complex.

Our view of curriculum is holistic. It includes infrastructure, including educational media and platforms for online and virtual modes of learning; study material in different formats

compiled by ourselves and students, such as readers and Power Point slides; methods of facilitating and assessing learning, including peer teaching and peer and self-assessment; strategies for ensuring the well-being of self and students; and, unavoidable, content (*What*) and the *How* and related-learning outcomes. The how of learning undeniably includes learning theories such as learning-centred approaches, constructivism, self-regulated learning, Whole Brain® thinking – all touched on by Smit.²⁰ It includes human capital – assets such as the lecturer and students and many more – all aspects that constitute learning environments with distinct learning cultures. As an overarching umbrella the construct *Whole Brain® curriculum* resonates with what we are, what we intend to be – our *becoming* as Slabbert, De Kock, Hattingh²⁶ put it – and what we do with what we have.

To ensure the sustainability of our transformational practice the scholarly community of practice convenes by means of in-person or online meetings, attending one another's learning opportunities, whether in the form of contact sessions such as clinical skills mastery in the laboratories or joining online sessions. In this way, we build professionalism of which reflexivity is an essential ingredient and attribute of 21st century learning.²⁷ This attribute of a professional, namely to become a reflexive clinical associate should be instilled into our students. This is especially of the essence in interprofessional workplace contexts that Baerheim, Ness and Raaheim²⁸ wrote about. In clinical practice context, reference is made to interdisciplinary teams – for example, teams consisting of a nurse, a clinical associate, a surgeon and a dietitian. The overarching goal is to improve treatment efficiency and patient care in a holistic fashion. Phrabo et al.²⁹ highlighted the role of reflexivity in team dynamics and leadership development, an attribute that is indispensable in our students' clinical practice and our community of practice.

This community of practice is constituted by six academics. Four are early-career academics, specialising in medical clinical practice. Two are established academics: one specialising in the educational professional development of academic staff and the other the coordinator of the BCMP programme. In our context professionalism is a two-sided synchronistic endeavour that the authors had to pursue – metaphorically referred to as a courtship. Students' enactment of what professionalism in clinical settings entails, is demonstrated whilst on authentic clinical practice experience at public hospitals that serve as clinical learning centres (CLCs) – also referred to as work-integrated learning (WIL) – under the supervision of clinical mentors and facilitators. Or, in simulated environments, such as clinical skills laboratories where peers act as 'patients' to one another.

As a number of the students are familiar with the public hospital and clinic settings in rural areas, our learning from them is invaluable. These students have a wealth of knowledge built on real-life experiences.²⁶ Such real-life experiences more often than not are enriched by indigenous knowledge³⁰ that deepens our insight into the real world

with its challenges that we need to address in real-life educational settings; challenges the prospective clinical assistants need to address in clinical practice settings and will address in future. By being open to reciprocal professional learning, both our lecturer identity and their clinical associate identity are enriched, through role modelling, reciprocal professional learning and professionalism – all attributes of education of the 21st century that need to be part of the identity of any professional.

In addition, another attribute involves competence in contributing as a member of a team. As lecturers, we are members of the scholarly community that was established. For example, in the case of students, learning tasks often have to be performed by small groups in a clinical skills laboratory. This execution of tasks as a collective prepares them for the authentic world of work. In work settings as clinical associates, they will become members of a multidisciplinary team consisting of an array of health science practitioners as alluded to here. They will form their distinct communities of practice as Naidoo and Vernillo³¹ suggested it be carried out. Their study was conducted in a health sciences context and therefore serves as a well-contextualised exemplar.

Further to this discourse about what a construct frame entails, the authors offer the following view: to us a conceptual framework is not a loose standing entity within a scientific document, but gives flow to the scholarship demonstrated in our text from the very first sentence. However, this study offers a framework built from the cornerstones – work of leading scholars – found in relevant and recent literature. Where sources seem to be outdated it simply means that it is a seminal work. As constructivists, the authors prefer using *construct frame* instead of *conceptual framework*. Our construct frame is offered as the epicentre of the theories around which our study revolves. Citing sources throughout the text shows the fluidness of our thinking and insights and putting it into words. Whilst putting their thoughts into words the authors came to realise that they create new meaning during writing. The authors came to the conclusion that the entire article is a construct frame in itself; the construct frame changes continuously as we reflect before writing, whilst writing and after writing, imitating Schön's³² idea of three dimensions of reflection: reflecting before action, in action and after action, echoed by Bothelo and Bhuyan.³³ The latter is more specific to clinical practice, although in dentistry. Furthermore, the reflexivity in interprofessional workplace contexts that Baerheim, Ness and Raaheim²⁸ refer to, is especially of the essence in the workplace of the clinical associate. And the work by Phrabo²⁹ on team reflexivity speaks to both the community of practice of the lecturers and the clinical practice of the students.

Whilst we conduct action research, action learning²¹ is employed by the students. Action learning, as with action research, promotes attributes such as 'confidence, resilience, conflict resolution, teamwork, empowerment, leadership

skills, self-efficacy, critical thinking and problem solving' – all in alignment with our discourse, which Masango-Muzindutsi et al.²² advocate. This alignment accentuates the alignment between, *inter alia*, action learning, metacognition, self-regulated learning, reflexivity which is visible in the use of principles that are closely related. All of these notions of quality learning expect the student/professional to plan, execute the plan, observe what is happening and reflecting on the process and the outcome. The quality of our professional learning enriches our professionalism.

Distinct traits of professionalism is to act independently and to take responsibility for self-empowerment.¹⁷ As lecturers, we cannot empower students. Moreover, no individual can empower another. In our workplace context, early-career academics can only empower themselves. Similarly, it is only the self that can maximise own potential as Slabbert and his co-workers²⁶ assert. Integral to our professionalism as lecturers and our students as prospective clinical associates are leader qualities. As any profession is multi-dimensional – and the lecturer profession and clinical associate profession are no different – leader qualities are integral to our maximising²⁶ own potential and self-empowerment. We all have latent leader potential, which should be exploited by the self. Leadership competencies should be made visible – through our lecturer persona and actions and through students' practising leadership skills that will be of the essence in their future clinical world of work. When analysing the profession of the lecturer and the profession of the clinical associate, it becomes clear that leader-identity formation³⁴ inevitably forms part of both our lecturer identity and our students' clinical associate identity.

Peer mentoring resonates with self-exploring of own leader potential. Peer mentoring is yet another role lecturers and clinical associates need to fulfil. Peer mentoring, in our context, is activated when a scholarly community of practice is formed. The formation of such communities of practice is common in education contexts but is used in other contexts such as the corporate world and any health sciences³⁵ contexts, such as the clinical practice of the clinical associates. Peer mentoring is reciprocal in nature and is built on the principles of socio-constructivism. Some scholars refer to *reversed mentoring*.³⁶ This means that the early-career academics take the position of the facilitator of professional learning – they facilitate one another's professional learning and from time to time the professional learning of the established academics. This became evident because the established academics learnt from their early-career counterparts, especially in terms of using educational technology in general and the online learning platform the university uses. What we derived from the peer mentoring that took place is that it contributes to developing professionalism – professionalism of both the academics and the prospective clinical associates.

The context-specific educational professional development of the members of the scholarly community of practice in

question was self-initiated. Our approach to educational professional development regards transformation as an overarching developmental process for all involved. Our aim with transforming self and practice, as advocated by Du Toit,²³ is to be custodians of transformational teaching practice and transformational clinical practice.

Our ontological stance complements our epistemological view. Through a lens of Whole Brain[®] constructivist thinking, we constantly look at the self and practice – what we do daily. Using the Whole Brain[®] lens, activates self-study, and this offers us the opportunity to zoom in on the actions of the self – the 'I' and as a collective, we look into the actions of the community of practice – the 'we'. These actions pertain to what we do in our teaching practice and what we do in terms of research. It is about self-empowerment and self-regulated professional development – becoming a well-rounded independent academic who takes ownership of maximising own potential.²⁶ Looking constantly at self and practice is what clinical associates should do. Their observations, using a Whole Brain[®] constructivist thinking lens, activates the study of themselves as prospective clinical associates. They are expected to take responsibility for own self-regulated learning – becoming a well-rounded independent clinical associate. The notion of maximising potential is enriched by the values the university¹ holds. The values of *excellence*, *innovative thought* and *inquiring mind*, for example, allow for new meaning making. The qualities that the values embody are integral to scholarly communities of practice; they are the educational ingredients we use for sustaining our transformational teaching practice claim. These values are to be instilled into our students: as clinical associates they need to pursue excellence in clinical practice, should become innovate thinkers and develop an inquiring mind.

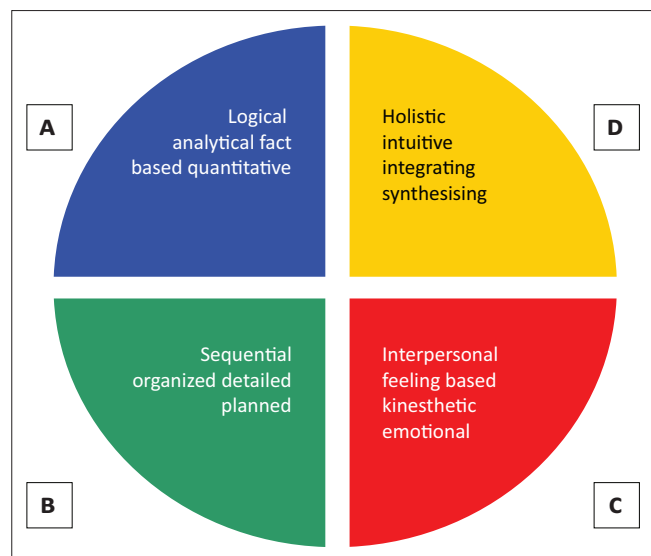
As alluded to here, any best practice, cutting-edge practice, evidence-based practice has transformation as its foundation. Any transformation, although, starts with the self as Du Toit²³ points out. The notion of starting with the self-holds that self-awareness is imperative. For the purpose of in-depth insight into the self, we opted for using a scholarly and validated means of determining how we think differently – the different modes of thinking we prefer. For this purpose, we draw on the seminal work of Herrmann^{9,13} and the extensive studies by De Boer et al.³⁷ The theory of Whole Brain[®] thinking informs our entire ontological existence: who we are; what we do; how we do it; our mindset that includes willingness to be innovative; how we think; our becoming, as Slabbert et al.²⁶ accentuate, as lecturers and clinical associates. We, as a collective, consider ourselves to be part of a professional development trajectory that reflects each individual's signature practice and professional branding. The latter refers to our branding as lecturers and our students' branding as clinical associates.

The essence of our preference for different modes of thinking is that it informs what we do; it informs the way we facilitate

and assess learning; our communication; our problem solving; execution of tasks; how we approach conducting research; how we contribute to the actions of a scholarly community of practice – all dimensions of the dynamics of our becoming. Our becoming²⁶ as a dynamic process is juxtaposed with a stagnant state of being. As we have preferences for different modes of thinking, so do our students. What is outlined for us in the previous sentence applies to our students. Herrmann⁹ 'calls these actions cognitive preferences or preferred modes of knowing'.

Herrmann⁹ based his four-quadrant model (Figure 1) on the principle of 'interconnected clusters of specialised mental processing modes that function together situationally and iteratively, making up a Whole Brain[®] in which one or more parts naturally' take dominancy.¹⁵

The Model (Figure 1) represents Herrmann's⁹ insight into the function of the brain. He distinguishes 'four distinct modes of thinking'. In brief, the A-quadrant mainly represents a fact-based mind – also referred to as the *intellectual self*. This quadrant focuses on 'logic and analytical thinking that revolves around, for example, quantitative measures'. The B-quadrant represents a mindset that thrives on sequential thinking – referred to as the *safekeeping self*. Thinking in this quadrant is, *inter alia*, about 'being organised, detailed and planned when executing a task. The C-quadrant is about emotive thinking' – the *emotional self*. This quadrant is about thinking where interpersonal 'relations are prominent and feeling-based thinking and kinaesthetic movement, for example, contribute to one's thinking' when executing tasks. The D-quadrant represents an experimental mindset – *experimental self*. It is about 'thinking in a holistic way' that may 'include synthesising', integration, 'visuals, thinking intuitively', etc. These modes of thinking inform, amongst others, one's approach to solving problems, communication and teaching.



Source: Du Toit PH. Whole Brain thinking. PowerPoint presentation, Postgraduate certificate in higher education, 13 February. Pretoria: University of Pretoria; 2019 (Unpublished).

FIGURE 1: Simple representation of the metaphoric Whole Brain[®] Model.³⁸

Embarking on a trajectory of professional development requires reflecting on self. Our professional learning includes reflective practice.²⁰ So does the professional development of the clinical-associates-to-be. Reflection is intrapersonal and interpersonal for our students and us. For students, it is enacted at an intrapersonal level during action learning as Revans (cited in Cho and Egan³⁹) asserts. New meaning is constructed through a process of critical reflection. For our students, action learning is complemented by the principles of self-regulated professional learning. As lecturers, our professional learning is intrapersonal when action research is the design of choice and interpersonal when we opt for participatory action research.⁴⁰ In action research the focus is on the 'I'; in participatory action research the focus is on the 'we'. The ontological means of being, or rather becoming as Slabbert et al.²⁶ asserted, which is intra- or interpersonal, is derived from our insight into the notion of multiple intelligence.⁴¹ Our choice of participatory action research is discussed next.

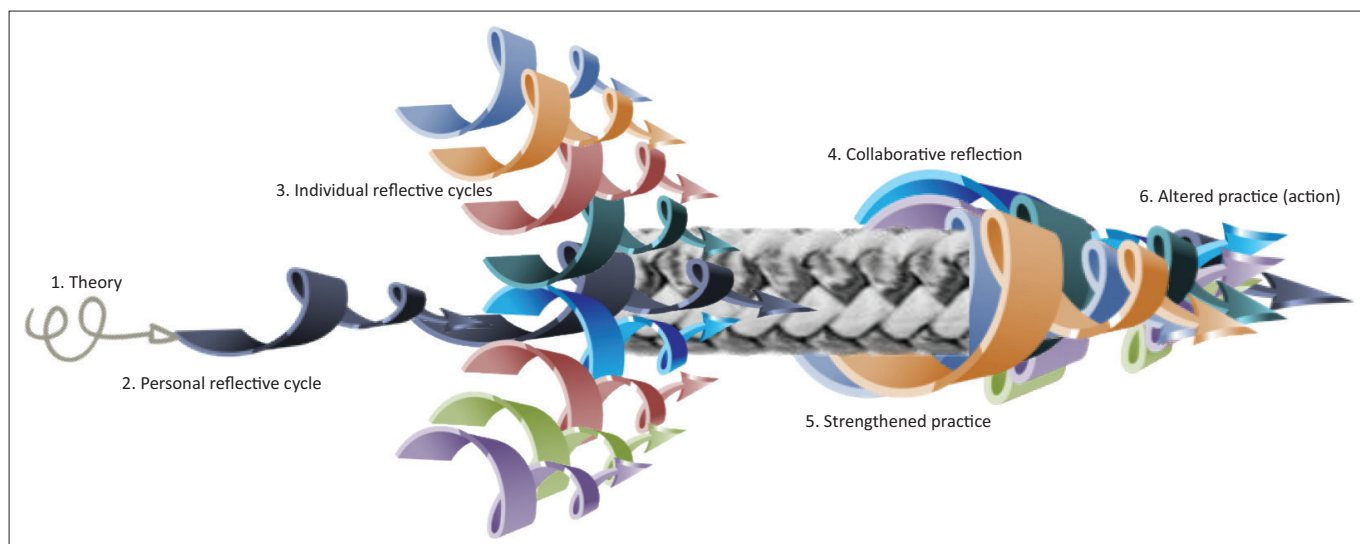
Research design

Our research design of choice is both action research and participatory action research. However, the latter is the focus in this article. The authors opted for using Randewijk's model.⁴⁰ It fits our lecturer professional development in a health science context. Figure 2 is a representation of the model.

What intrigued us about the model is its metaphoric value. The authors consider their tight community of practice a rope consisting of a number of strands. To fit our context we have made some minor changes to explain the different phases. However, the phases do not follow one another in a sequential manner as can be derived from our discussion that follows.

The point of departure for our participatory action research is our distinct BCMP context and making meaning of it. The context includes all assets, such as human capital – lecturers and students – facilities, learning theories, teaching and learning practice. In Phase 1 we use existing theories and create our own, based on lived experiences. The latter are part of the notion of living theory.^{6,7} As a scholarly community of practice, consisting of six academics, each has its personal and individual reflective cycle – Phase 2 and Phase 3. Emanating from Phase 2 and Phase 3 is our collaborative reflection. We learn from one another in a reciprocal fashion. This reflection ties in with what has been alluded to here – enacting the attribute of reflection^{16,18,21} as part of our professionalism.

Our vision is to transform our practice continually, Phase 5, by strengthening our competence in offering quality teaching with a view to ensuring quality learning and strengthening our SoTL. Within Phase 6 continual acting to transform becomes evident. However, all six phases are executed



Source: Randewijk E. Informing the facilitation of Mathematics in the senior phase using Herrmann's Whole Brain® theory [unpublished thesis]. Pretoria: University of Pretoria; 2020.

FIGURE 2: Participatory action research model.⁴⁰

continually and simultaneously. It is typical of the fluid nature action research and participatory action research take as McNiff⁶ asserted.

Each individual's transforming of self and practice strengthens their professionalism, here shown as strands of rope, alluded to here but also contributes to the strengthening of the community of practice, indicated as the rope itself.

In our meaning making of how our participatory action research could be enriched, we integrate participatory action research with the principles of thinking preferences. This integration makes sense in our context as WBPARG becomes integral to our practice. We consider our conducting of WBPARG as transformational scholarship.

Our differences in ways of thinking become evident in the data presented here. As individuals the authors have strengths that might be lacking in others; as a group they are positioned to determine where we are lacking in terms of modes of thinking. This is touched on next.

Complementing our participatory action research is evidence gathered to justify our claims of using the principles of Whole Brain® thinking in practice. Using the principles of Whole Brain® thinking relates to multiple relationships: Firstly, the relationship with self. It assists in insight into how one executes tasks. Secondly, the relationship with others – peers and students. This relationship relates to accommodating as the *other* have their own thinking preferences. It is the self who needs to adapt. One needs to adapt in terms of facilitating and assessing learning, communicating with others, etc. In the same way, students need to master the skills of adapting to others' modes of thinking. This is essential when working as a member of a team. This is essential as this will have a bearing on one's entire demeanour as a clinical associate in the future.

Ethical considerations

The study is based on the principles of self-study. The authors are the participants. They report on themselves. The study was approved by Faculty of Health Sciences, University of Pretoria, reference number: 56/2011.

Results

The research method explained next-generated baseline data applicable to all the sub-projects we are conducting and will be conducting in the future – strands of rope. In identifying thinking preferences, the HBDI® was employed to generate essential data. The questionnaire was developed around 1995/1996 by the father of Whole Brain® Learning, Ned Herrmann. The HBDI® consists of 120 items.⁴² It has been identified as an instrument that has significance for education. Validity of the instrument was determined based on analyses of the different categories by Bunderson and Ho, cited by Coffield et al.⁴² and as reported by Clayton and Kimbrell.⁴³ The data reported in this article is valid with respect to the following: Factorial, construct and face validity. Up to date more than 2 million people have completed it across the globe.⁴²

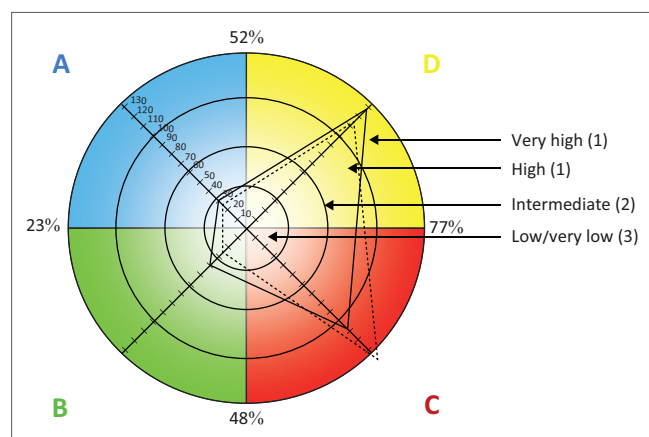
The way in which qualitative data are generated is discussed next. It gives an overview of what brain profiling is about. The brain profile displayed is that of one of the lecturers.

Figure 3 indicates the extent to which one has a preference for a specific mode of thinking. It is indicated by separate quadrants, identified by means of symbols A, B, C and D as mentioned earlier. The extent to which an individual has a preference for a particular mode of thinking is shown in the circles within circles. The closer the end of the plotted line on the diagonal axes to the perimeter, the greater the preference. The further the end of the line from the perimeter, the lesser the preference.

When an individual has a very strong or strong preference for modes of thinking that fit a specific quadrant it is indicated in the two circles closest to the perimeter. This is referred to as a primary choice. If the choice is indicated in the second inner circle, it means that the individual has an intermediate preference (choice) for the specific quadrant. A low or very low choice would fall in the inner circle, closest to the centre. This is referred to as a tertiary choice. A primary choice is indicated by 1; an intermediate choice by 2 and a low or very low (tertiary) choice by 3. Using these numbers in sequence, for example, 3>2>1>1, indicates a preference code. The exemplary profile used is the profile of one of the established academics. It indicates that the academic with this profile has a tertiary preference for quadrant A, indicated by 3; a secondary choice for quadrant B (2); a high preference for quadrant C (1) and the highest for D (1). Such a profile, with two first choices (primary) is referred to as being double dominant.

Based on preference codes, different types of profile are distinguished. Double dominant profiles are the most common. Double dominance means that two quadrants are most preferred, whilst other quadrants may be secondary or tertiary choices. It may be the case that three quadrants are chosen as most preferred. In this case, the profile is triple dominant. Quadruple profiles, where all quadrants are chosen as most preferred, are rare.

The results from the HBDIs^{®44,45,46,47,48,49} that we have completed are visually presented in Figure 4. It constitutes sets of qualitative data. The qualitative data includes a visual representation of the thinking preference profile (commonly referred to as a brain profile) for each lecturer. The solid line indicates the individual's preferred modes of thinking. The dotted line indicates how one's profile may shift when under stress. A narrative description forms part of each data set. The sets of quantitative data are not reported except for an indication of the Preference Code and Profile Score. In Figure 4, the six profiles serve as exemplars showing how we as a group of lecturers differ in the way we think. This, as alluded to here, inevitably has implications for the way we facilitate and assess learning, communicate, do research, execute tasks in general, etc.



Source: Du Toit PH. Whole Brain thinking. PowerPoint presentation, Postgraduate certificate in higher education, 13 February. Pretoria: University of Pretoria; 2019 (Unpublished).

FIGURE 3: Determining thinking preferences.³⁸

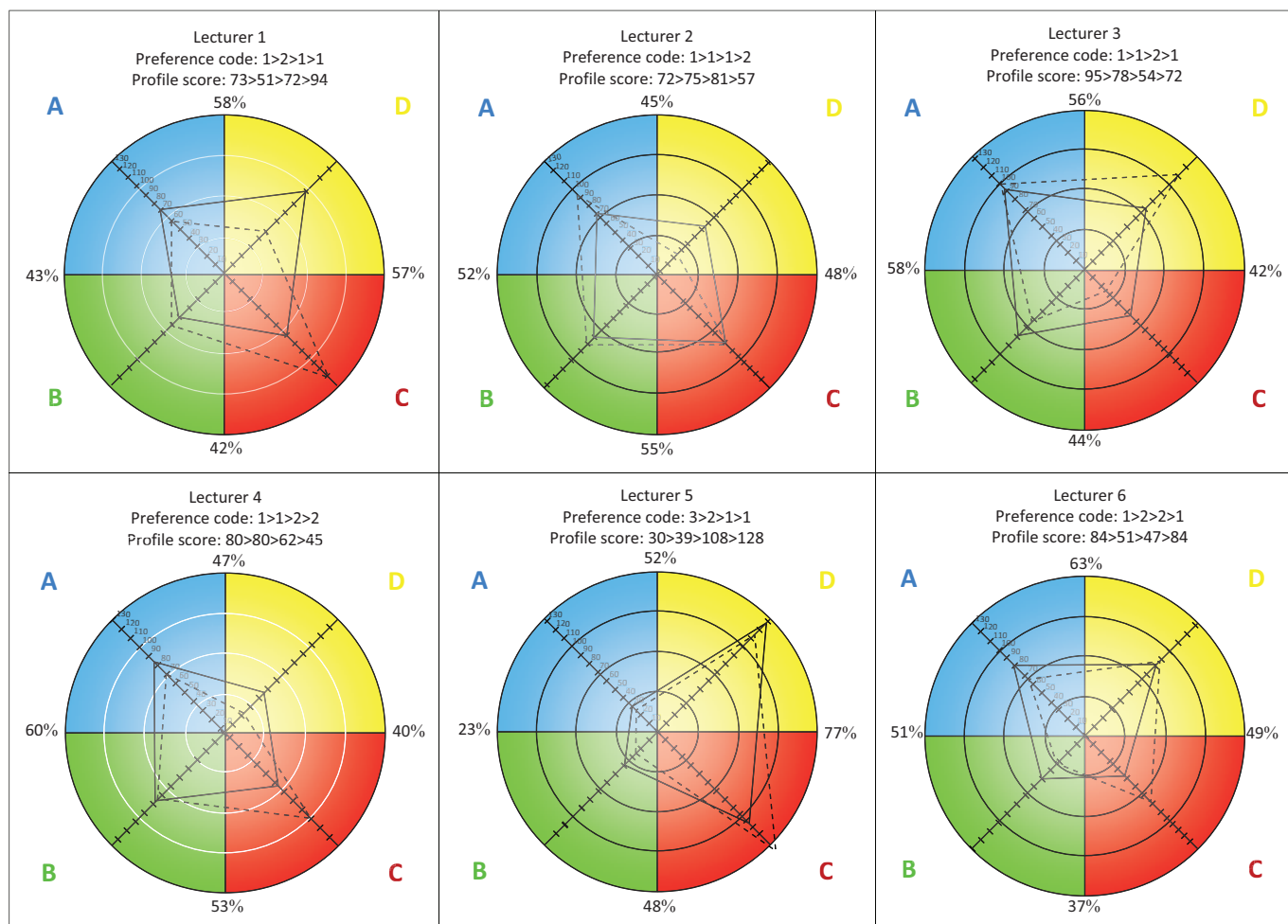
The preference code is an indication of the quadrant each individual has a high preference for, indicated by 1; which one is intermediate or secondary, indicated by 2, and which one is tertiary, indicated by 3. In case of the latter, 3 is an indication of avoidance or aversion of the specific quadrant. It should be observed that the theory is simply about preferences and not abilities. Should one indicate a 2 or a 3 for a specific quadrant, it does not suggest that one would not be able to execute tasks that require modes of thinking within this quadrant. The profile of Lecturer 5 indicates that he does not have an affinity for quadrant A that has fact-based thinking as focus. Fact-based thinking aligns with research. Therefore, it does not mean that the lecturer cannot conduct research. This is where maximising one's potential features. The profile works like a rubber band – indicating one's comfort zone. One can, as for Lecturer 5, stretch oneself – out of one's comfort zone – to work within quadrant A. But, as soon as the task of conducting research is performed, the rubber band comes back to its original resting place. One might have the ability to do something, but should one be offered a choice, one may prefer to avoid becoming involved in tasks of which the nature is such that one's preferred modes of thinking are not accommodated. The brain profile of each lecturer is explained next. It comes in narrative format. It is taken from the feedback report, with some sentences changed – it is not a verbatim report and therefore cannot be put in quotation marks. Putting only a few words in each sentence in quotation marks would be superfluous. As most of the profiles across the globe are similar and discussed in the same manner by using the same descriptive words, it becomes quite general. Similarities are unavoidable.

Lecturer 1 (Herrmann Global)

The interpretation of the profile of Lecturer 1⁴⁴ comes in a narrative format. It offers qualitative data about this member of our scholarly community of practice. Her most preferred quadrant is D. Key descriptors she selected are *intuitive*, *creative* and *synthesiser*. The one most descriptive of her is *intuitive*. Work elements she strongly relates to are *innovating*, *conceptualising* and *creative*. The next preferred quadrant is C. Descriptors selected are *emotional* and *intuitive*. The descriptor indicated as most descriptive of her work is *intuitive*. Work elements she strongly relates to are *expressing ideas* and *interpersonal aspects*. In the B-quadrant, which is the next preferred, the one key descriptor is *conservative*. The work element she strongly relates to is *planning*. 'A' is the less preferred quadrant. Key descriptors selected are *logical*, *critical* and *analytical*. Work elements are *analytical* and *problem solving*. Under pressure there is a shift: moving away from the preferred quadrant whilst C becomes the highest.

Lecturer 2 (Herrmann Global)

The description of the profile of Lecturer 2⁴⁵ reads as follows: The C-quadrant is the most preferred. Descriptors selected are *musical*, *emotional*, *spiritual* and *reader*. These descriptors represent a general overview of her mental preferences in



Source: Herrmann International/Global.

FIGURE 4: Thinking preference profiles of members of the scholarly community of practice.^{44,45,46,47,48,49}

day-to-day life. Work elements she strongly relates to in this quadrant are *teaching* and *writing*. These elements reflect mental preferences at work. By only a slight margin, her next most preferred is the B-quadrant. She selected *conservative* and *reader* as descriptors. Work elements she does well include *implementation*. Next is the A-quadrant. *Mathematical* and *analytical* are descriptors selected with *analytical* being her key descriptor – the one most descriptive of her. Work elements include *analytical* and *problem solving*. The least preferred quadrant is D. *Holistic* was selected as a characteristic. Her stress profile suggests that she can contain herself under pressure. It is only the D-quadrant that recedes into the background.

Lecturer 3 (Herrmann International)

The narrative for Lecturer 3⁴⁶ as a set of qualitative data are briefly explained next. The quadrant most preferred is A. Descriptors in this style are *logical*, *analytical*, *critical* and *quantitative*. *Rational* is her key descriptor. These descriptors represent a general overview of her mental preferences in day-to-day life. Work elements she strongly relates to in this quadrant include *analytical*, *technical* and *problem solving*. These elements reflect her mental preferences at work. Her next most preferred quadrant is B. As descriptor, she

selected *conservative*. Work elements identified as ones she does well include *planning*, *administrative* and *implementation*. Next preferred quadrant is the D-quadrant. Descriptors selected are *holistic* and *intuitive*. Work elements she does well include *creative*. Her least preferred quadrant is C. She selected *intuitive* as a characteristic of her. Under pressure her profile may shift to A being the second most preferred quadrant, with B the third, then C as the lowest and D becoming more dominant.

Lecturer 4 (Herrmann International)

The profile of Lecturer 4⁴⁷ can be interpreted as follows: Quadrant A and B are both selected as the most preferred. Next is C with D as the least preferred. Under pressure, the lecturer may focus more on modes of thinking that fit the C-quadrant with this quadrant becoming more dominant and the D-quadrant receding into the background.

Lecturer 5 (Herrmann International)

The profile of Lecturer 5⁴⁸ is built up by the following: The most preferred quadrant is D. Descriptors selected are *imaginative*, *synthesiser*, *artistic*, *holistic* and *intuitive* – representative of mental preferences in day-to-day life.

Work elements include *integration, creative* and *innovating*. The next most preferred quadrant for this Lecturer is C. Descriptors selected are *musical, talker* and *intuitive* with *emotional* as the most descriptive. Work elements include *teaching, writing* and *interpersonal*. B is the next preferred quadrant. *Talker* was selected as descriptor; work elements identified include *implementation*. The least preferred quadrant is A. No descriptors were selected. When under pressure this lecturer's profile does not shift much, except for the C-quadrant that becomes more dominant.

Lecturer 6 (Herrmann International)

The quadrant most preferred, based upon this lecturer's⁴⁹ responses is the A-quadrant. Descriptors in this mode of thinking selected are *analytical, rational* and *mathematical*. These descriptors represent a general overview of the lecturer's preferences in day-to-day life. Work elements the lecturer strongly relates to in this quadrant include *analytical* and *problem solving*. These elements reflect the lecturer's mental preferences at work. Work preferences may align completely with general preferences or they may stem from situations unique to the working environment. In the D-quadrant the lecturer selected *imaginative* and *synthesiser* with *holistic* as key descriptor. Work elements identified as ones the lecturer does well include *conceptualising, creative* and *innovating*. The next most preferred is the B-quadrant. In this quadrant *detailed* was selected as descriptor. The least preferred quadrant, based on the lecturer's responses, is Quadrant C. In this quadrant, *spiritual* was selected as characteristic of the lecturer. Responses to items that indicate one's preferences under pressure may or may not be consistent with the general behaviour of the lecturer. When under pressure this lecturer's profile shifts to the less-preferred quadrant, namely C that becomes more dominant, with generally preferred ones, such as Quadrants A and B, receding into the background.

The mean preference code of the group is $1 > 1 > 1 > 1$. This indicates that the group of lecturers as a collective form a composite whole group. However, as the group is quite small, a closer look into the highest scores on the respective quadrants is needed. The highest score is for Quadrant B with a total of 474; second is the score of 434 for the A-quadrant. The total score for the C-quadrant is 424 and for D it is 400.

The data sets are discussed in the next section.

Discussion

When the scores of the profiles are studied more closely, it becomes clear to what extent the scores for the different quadrants per individual differ. An exemplar of comparing the profiles of two lecturers when they have to work together on a task is offered next. It is of note that for Lecturer 6 the score for Quadrant A and D is the same (84), whilst Quadrant C is lowest at 47. For Lecturer 1, the highest score is for Quadrant D (94) and the lowest for Quadrant B at 51. If

Lecturer 6 and Lecturer 1 were to work together as a team, it can be deduced that they will complement one another to some extent. However, what they need to work on is Quadrant B as they both have a low score of 51. It may most probably be the case that the low score (47) of Lecturer 1 for Quadrant C will be compensated for by Lecturer 1 owing to the higher score of 72. These scores will influence both their teaching practice and research. Lecturer 6 might struggle with working on the curriculum as part of a curriculum development team or doing research as part of a team. This lecturer most probably prefers working as an individual.

Another exemplar of having two lecturers working together is in the case of Lecturers 4 and 5. The score for Quadrant A (30) – the lowest for all the quadrants of the entire group – shows almost an aversion for this Quadrant by Lecturer 5. This is in contrast to the high score of 80 for A by Lecturer 4. It can be said that the low score of Lecturer 5 will be compensated for by the high score of Lecturer 4. The same is to be observed in the case of Quadrant B: Lecturer 5 displays a low score of 39 whilst the score for Lecturer 4 is a high of 80. Opposed to this, it is of note that the high score of Lecturer 5 on Quadrant C (108) may compensate for the lower score (62) of Lecturer 4. The same counts for Quadrant D: The score for Lecturer 5 is 128, whilst for Lecturer 4 it is 45. It must be reiterated that Whole Brain® thinking is not about abilities but preferences. It is of note that Lecturer 5 is the principal researcher. It does not mean that, whilst struggling with doing research (Mainly Quadrant A) he does not have the ability to conduct research. It, however, is significant that the research is performed by a community of practice – the profile score for Quadrant C is 108. And, as this lecturer's score for Quadrant D is very high (128) it is evident that many of the creative ideas when it comes to conducting research, or to transform teaching practice is initiated by Lecturer 5. The high score of 108 on Quadrant C and the low score for Quadrant A (30) may indicate that he has a preference for doing action research and being included in participatory action research and not so much for quantitative, empirical studies.

Lecturer 4, for example, needs to work on becoming more creative when facilitating and assessing learning. And she might need to keep attributes of the C-quadrant in mind as her teaching practice and research are most probably very structured and focused on facts.

Although there are some indications of compensation where two individuals work together, one should keep in mind that each individual has to attend to quadrants with low scores with a view to becoming a Whole Brain® lecturer, Whole Brain® researcher and to maximising own potential.

For the group of six, there is evidence that the community of practice will be able to come up with constructive solutions to problems as the members will contribute from different perspectives. What the group will need to work on is Quadrant D. This is true for their teaching practice and their research.

Action research and participatory action research are C-quadrant dominant. As these research designs are focused on intrapersonal aspects (the 'I') and interpersonal aspects (the 'we'), the group as a collective need to work on attributes of the C-quadrant with a lowest group profile score of 400. For example, individuals, especially those with a low score for Quadrant C, need to work on expanding their repertoire of aspects related to working with others.

One has to keep in mind that these data sets on the profiles of the lecturers are exemplars of what we can expect in the first-year cohort. To accommodate all the differences in preferences for specific modes of thinking, we have to be adaptable. For example, Students need to perform learning tasks in the laboratories for mastering clinical skills; these tasks need to accommodate students with preferences for different modes of thinking. What the tasks require includes all modes of thinking. When working in small groups, or performing a head-to-toe examination on a peer who acts as a patient, the dominant quadrant is C, accommodating students who prefer working with others, sharing ideas, etc. It also accommodates D-quadrant thinking as students may be challenged to come up with visual representations. New meaning is constructed that fits the A-quadrant that includes fact-based thinking. Students have to organise themselves and devise a plan that they need to follow and execute with a view to achieving the envisaged final outcome and monitor the execution of the plan in terms of steps to be taken, typical of the B-quadrant.

Similarly, prospective clinical associates have to keep in mind that their profiles are exemplars of what they can expect in clinical practice – be it authentic real-life settings or simulated settings, such as clinical skills laboratories. To accommodate the differences in preferences for specific modes of thinking that peers in class contexts, patients and other health professionals may have, they need to be adaptable. For example, students need to perform learning tasks in the clinical laboratories, execute tasks in authentic real-life settings, such as hospitals and work with multidisciplinary teams and with patients. These tasks need to accommodate students with an array of different thinking preferences. What completing the tasks requires includes all modes of thinking. When working in small groups or performing a head-to-toe examination on a peer who acts as a patient the dominant quadrant is C, accommodating students who prefer working with others, sharing ideas, etc. It also accommodates D-quadrant thinking as students may be challenged to come up with visual representations. New meaning is constructed that fits the A-quadrant that includes fact-based thinking. Students have to organise themselves and devise a plan that they need to follow and execute with a view to achieving the envisaged final outcome and monitor the execution of the plan in terms of steps to be taken – attributes of the B-quadrant.

In essence, what the courtship comes to is the following: we have to demonstrate to students how the principles of Whole Brain® thinking are used to transform our teaching practice in

Whole Brain® facilitating and assessing learning and in other roles we have. Students as prospective clinical associates need to use the principles of Whole Brain® thinking with a view to adapting their learning to become Whole Brain® professionals and transforming practice to ensure Whole Brain® patient care, Whole Brain® communication with members of a multidisciplinary team and other roles they have to enact.

The two groups of professionals appreciating the courtship are students as prospective Whole Brain® clinical associates and Whole Brain® lecturers. Transformational clinical practice and transformational teaching practice are only possible when the professionals take responsibility for transforming self and practice – Whole Brain® transformational practice. Any courtship can last only as long as the two parties involved nourish each other.

In the context of our study, a scholarly courtship may be the means to achieve a designated and sustainable professionalism.

Conclusion

Our claim to transformational practice and transformational participatory action research is justified by implementing the principles of Whole Brain® thinking. Our claim that our practice is transformational because it uses reciprocal professional learning is justified by evidence of learning from one another in that our preferences of modes of thinking are different. This is also evidence of how our respective modes of thinking inform our lecturer identity. In view of the fact that our practice is learning centred, reciprocal learning is extended to what the authors can learn from our students. By demonstrating attributes to be enacted in an authentic place of work, the authors act as role models for our students who should enact the same attributes in their future clinical world of work.

The authors advocate that the notion of empowering others is a misnomer. One can only empower the self. This highlights the fact that self-empowerment and self-regulated professional learning are approaches that would help monitor one's professional development trajectory. These acts of taking responsibility feed into both lecturer-identity formation and clinical associate-identity formation.

In essence, professionalism takes centre stage. In our meaning making, staying true to our constructivist epistemology, the authors would like to add to the current body of knowledge on professionalism the construct *Whole Brain® professionalism*. This distinct attribute of professionalism is true for all professions, but in the context of this article specifically the profession of university teachers and the profession of clinical associates. This is the insight the authors bring into the domain of SoTL and the scholarship of professional development of clinical associates. The authors would like to contribute to scholarship of participatory action research by adding the constructs *Whole Brain® participatory action research* and *Whole Brain® action learning*.

Do we dare leave the reader with the following: What about a Whole Brain® scholarly courtship?

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Competing interests

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Authors' contributions

P.H.d.T. was responsible for research leadership, conceptualising of the study, literature review, writing of manuscript, data gathering and management, editing; L.T., S.C.-Z., M.O. and B.M. were involved in co-conceptualising of study, literature review, acting as educational practitioners they generated self-knowledge as data; M.L. was involved in co-conceptualising of study. He acted as a critical reader, monitored and evaluated the study as coordinator of the BCMP programme and generated self-knowledge as data.

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Data availability

Data sets contain confidential information per individual participant that is not accessible to any other person as it is coded. It is the prerogative of each participant to share own data on request. The data sets are kept in the data verification and analysis system of Herrmann International and/or Herrmann Global. Although the company and the registered HBDI practitioner have access to the data, the data cannot be revealed. This provision is in line with the POPI act with a view to honouring integrity and ethics practice.

Disclaimer

The views expressed in this article are that of the authors and do not constitute the official position of the university.

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