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Multidisciplinary collaboration: A necessity for curriculum innovation

Dr Pieter H du Toit
Department of Humanities Education
E-mail: pieter.dutoit@up.ac.za

Prof Ann-Louise de Boer
and
Prof Theo Bothma
Department of Information Science
University of Pretoria
Pretoria, South Africa
E-mail: ann-louise.deboer@up.ac.za
and theo.bothma@up.ac.za

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Abstract:

The context of the research reported in this paper is teaching a module on Information Literacy at university level, with a specific focus on curriculum development and professional development of academic staff. Continuing professional development of academic staff at universities has become an imperative in South Africa. This is inter alia a consequence of the new education dispensation that emphasises the importance of higher education and training that recently resulted in the South African government appointing a minister of higher education and training for the first time. This imperative is underscored by several initiatives taken by higher education institutions in the country. The University of Pretoria is no exception: Professional development of academic staff is increasingly being highlighted in policy documents, in the welcoming speech of the newly appointed Principal, strategic initiatives in this regard by the office of the Vice-principal responsible for undergraduate studies, the Department for Education Innovation that takes responsibility for academic staff development and the Division for Higher Education in the Faculty of Education that offers a formal higher education qualification – all integrated and linked to the current operational performance management system.

1 Introduction

> *Man's mind, once stretched by a new idea, never regains its original dimensions* (Oliver Wendell Holmes, Jr).

The Department of Information Science, Faculty of Engineering and Build Environment at the University of Pretoria is responsible for offering a semester module on Information Literacy to all first year students across all faculties annually. The module is presented to more than 8000 students and addresses the process model for information literacy, namely the Big6 Information Literacy model (Berkowitz & Eisenberg, 1997).

A textbook, *Navigating Information Literacy: Your information society survival toolkit,* (Bothma et al, 2009) written by subject specialists from the Department is used as learning material for the module. Although the module has an acceptable pass rate, the scholarly application of the applicable skills linked to the subject content and learning outcomes is limited and in some cases lacking in subsequent academic years of study. In their endeavour to empower students to develop as lifelong learners the Department introduced a collaborative project entitled: *Facilitating Whole Brain Information Literacy: An interdisciplinary research project.* At the same time, to empower all staff involved, the Department embarked on a research project that covers aspects such as professional development of staff and curriculum research, which forms the focus of this paper. The professional development of academic staff is one of the sub-projects. The overarching project consists of the following ten sub-projects:

- Baseline study
- Professional development of academic staff
- Information literacy across the curriculum
- Education innovation
- Research output
- Strategic partners
- National and international collaboration
- Leadership and management in higher education
- Community engagement
- Funding

These sub-projects are closely integrated and confirm the multidisciplinary nature of the project.

The multidisciplinary team consists of information science specialists, librarians, instructional designers, educational consultants and staff development professionals. They were invited to participate in a collaborative process to enhance the curriculum, and to design and develop teaching and learning material. The learning material has been developed as a lecturer's 'toolkit' that aims at enhancing information literacy skills across the curriculum and instilling a culture of applied information literacy within the learners.

The overarching research project commenced with a baseline study. It entailed a quantitative approach to determining the learning style profiles of a first cohort of students, the lecturers and other professional staff involved. For this purpose the Herrmann Brain Dominance Instrument (HBDI) was used. The baseline study, presented at IFLA pre-conference meeting 2009 with the title "*Facilitating whole brain learning: An innovative option for Information Literacy"* highlighted the fact that students have different thinking and learning preferences. Therefore, a teaching methodology embracing the notion of 'one style fits all' is not effective. It was decided that Herrmann's Whole Brain principles would be applied to all aspects of the project. Another part of the baseline study that concerned the academic staff is reported in detail in another IFLA pre-conference meeting 2010 with the title "*A mental model for successful interdisciplinary collaboration and cooperation in curriculum innovation for Information Literacy".*

The academic programme under discussion is currently put under a scholarly lens as an investigation from within the Department. An internal locus of control viewpoint is taken when it comes to quality assurance. A scholarly and action research-driven approach to quality assurance and knowledge management is taken. As theoretical paradigm and impetus for education innovation, whole brain learning forms the crux. As research paradigm and process for professional learning action research is promoted. Action research is considered most applicable when it comes to professional development and practitioner research.

This paper briefly links the baseline data of the two groups of lecturers and the group of students as background to the discourse on interdisciplinary curriculum development collaboration below. The curriculum research group consists of an array of staff members. So-called professionals include an education consultant, designers of learning material and an information specialist from the library. Two groups of lecturers are implied. A group of senior academics are responsible for developing the academic programme under discussion. The offering of the programme is the responsibility of a group of 16 junior lecturers. The professional development of both groups is the focus of this paper. Professional learning about and through whole brain learning and monitoring one's professional development and innovations in one's teaching practice by means of action research occurs on an ongoing basis. In addition to the brain profiling of the groups mentioned above, the brain profiling of the research project leaders as researchers forms the third dimension, although not reported. Quantitative data in the form of brain profiling of

the respective groups reported is based on Herrmann's whole brain theory and the theory of action research as it applies to organisational learning. A quantitative-qualitative mix enrich the data and consequent outcomes. Qualitative data includes observations by means of video recordings, photo evidence; and focus group interviews. The quantitative data reported is complemented by qualitative photo material. Quality assurance from a total quality management (Sukumaran & Marcheva, 2009) perspective is also highlighted.

The following focus areas, incorporating whole brain concepts, within the project will be highlighted:

- Whole brain interdisciplinary collaboration and cooperation within a quality assurance perspective
- Whole brain continual professional development of academic staff responsible for Information Literacy
- Using whole brain action research for constructing knowledge as living theory
- Whole brain curriculum design and development

2 Research Questions

Since the overarching research project covers a vast scholarly land within the higher education landscape relating to numerous research questions, only the following research questions are taken as guidelines for this part of the study:

- How is action research used to construct new knowledge in the context of the innovation of the Information Literacy curriculum in a whole brain manner?
- What is our basic model for curriculum development?
- How does interdisciplinary collaboration complement our approach to quality assurance and whole brain learning?

These questions are addressed in an integrating manner in the discourse that follows. The next section on action research covers both the research design of the project and the theoretical contribution it makes to the study. The constructivist nature of action research allows for engaging in collaborative curriculum development and the constructing of meaning.

3 Action research as process for professional development

In this project the different roles of a lecturer, such as facilitating learning, designing curricula, the leadership role, role of assessor, role of researcher and lifelong learner, among others, as stipulated in the *Norms and Standards for Educators* (South Africa, 1999) are closely integrated. The different roles lecturers have are interrelated and cannot be separated. The notion of becoming an independent

scholar of one's teaching practice is promoted by suggesting that all lecturers take responsibility for planning, monitoring and assessing their own teaching practice by means of action research and continuous scholarly reflection (Du Toit, 2009). In the same way, those responsible for the professional development of these lecturers do action research in the workshops they offer. Scholarly reflection is an integral part of action research and can be seen as an essential principle regarding professional development for all. To benefit from this scholarly approach it is proposed that all involved as members of the curriculum research team constantly go back to literature applicable to their field of specialisation and other relevant sources from other disciplines, such as management, mentorship, communication, knowledge management, quality assurance, professional development and research. It helps in developing a holistic and interdisciplinary view of one's practice and one's contribution to the entire research project. One such contribution is sharing knowledge as explained by Liebowitz (1999:3) who indicates that organisational knowledge is "processed information embedded in routines and processes that enable action. It is also knowledge captured by the organisation's systems, processes, products, rules and culture." Furthermore, it contributes to creating a professional learning community, or as referred to by some scholars as community of practice (Van Wyk, 2009) – contributing to organisational learning (Liebowitz, 1999). However, scholarly reflection cannot be done effectively without an accountable theoretical framework (literature review) and everyone involved in the curriculum research contributes to creating a body of references.

Scholarly reflection is an intrapersonal act with a view to improving what one is doing. Professional growth from such an intrapersonal locus of control viewpoint has to do with becoming a self-regulated, flexible, reflective practitioner/action researcher who can monitor his/her own progress. The process of continuous reflexive practice, also referred to as 'reflexivity' (Burton & Bartlett, 2005), has its roots in learning theories such as self-regulated professional learning and constructivism. However, intrapersonal scholarly reflection should contribute to collaborative, interpersonal scholarly reflection as a team, driven by the principles of socio-constructivism. In this regard the following observation by Zbaracki (1998:29) is very apt: "Social construction processes demand that we consider a dialectic process by which people negotiate an understanding of the everyday realities they encounter." In the context of our study such realities include one's practice (as lecturer, librarian, instructional designer, etc) and one's research activities. The dialectic approach includes constructing meaning, or what Liebowitz (1999) refers to as knowledge transformation. Furthermore, the dialectic approach offers team members the opportunity "to adding value or creating value by more actively leveraging the know-how, experience, and judgement resident within ….. an organisation" (Ruggles, 2010). Numerous opportunities for professional learning, apart from the workshops organised, take place on a continuous basis. It includes meetings within the core group and meetings with a wider learning community with an interest in whole brain learning that is not linked to the focus of our project, namely information literacy.

Every opportunity that allows for discussion is considered a constructivist learning opportunity that in some way enriches the curriculum development discourse. In order to allow for quality assurance a lot of the sessions so far have been based on idea generation and brain storming as suggested by Zbaracki (1998) as important for Total Quality Management (TQM). It is significant to mention as background to whole brain learning (figure 3) as briefly discussed below those team members who have a preference for fact-based learning and analytical thinking (quadrant A) and are structured and organised (quadrant B) are challenged to operate in a brain storming environment that is very open-ended, as it is aligned with quadrant D).

One of the purposes of our research project is to focus on the professional development of all involved. Such professional development is grounded in a reflective investigation of each team member's own practice in his/her specific context and contribution to the research project. Such a contribution includes constructing and sharing new insights – usually referred to as knowledge creation or knowledge management. Part of knowledge management in the university context would be to disseminate research findings by means of a journal or conference paper. In the context of our research project with its focus on curriculum innovation the constructing of new meaning/insights is continual. Therefore, knowledge management is a never-ending obligation all team members have. Furthermore, it is a collaborative effort that is enriched by the interdisciplinary approach followed. Evidence of this collaboration can be seen in the co-authorship of this paper, other papers and journal publications. By coining the terms 'scholarly knowledge management' and 'managing scholarly knowledge' we suggest that in a university setting the notion of knowledge management acquires a different meaning. It implies that knowledge creation is research-based and that the management of knowledge is researched – the reason for adding the word 'scholarly' to the constructs. This scholarly approach to knowledge management is evident in one of the PhD students' study in Information Science that investigates, among other, the entire communication and knowledge and knowledge management system operationalised within the research team as scholarly community. The study has a quality management focus and is concerned with "effective communication" as part of the TQM strategy that is followed, as recommended by Zbaracki (1998). However, our interpretation of 'effective communication' is 'whole brain communication', as can be substantiated by the work of Herrmann (1996).

The basic principles used for action research form the core of each of the team member's professional development strategies. Each one plans to transform what one is doing, implements the plan, monitors the implementation by means of scholarly reflection and evaluates in the end to determine to what extent the implementation contributed to a more transformative practice. Lessons learned from the process and each team member's experience are indicative of the way forward. By being critically reflective about what each member is doing one constructs new meaning of one's actions and contributions. Such new meaning is constructed in terms of each member's own practice and in terms of his/her contribution to the curriculum research. Furthermore it is constructed through what the research team

is collectively doing and by acting in a constructive way on what one finds, based on literature and experience.

The global acceptance of action research as a worthy and proven way of practitioner research (Burton & Bartlett, 2005; McNiff, 2002), especially in education and training, makes it the most appropriate way for us as practitioners to investigate our practices and to reflect critically on those practices. In the context of our study each member has a dual practitioner role. In the first place one is a practitioner in a field of expertise; secondly one is research practitioner. It empowers each team member to take responsibility for his/her contributions as a measure for quality assurance from within (bottom-up approach), opposed to quality assurance measures enforced externally from officials/management (top-down approach). Action research can be done by any practitioner taking responsibility for monitoring his/her professional development. Therefore it is also called practitioner research and self-reflective practice. In addition this empowering and emancipatory way of monitoring one's practice is aligned with the People Capability Model that Sukumaran and Marcheva (2009) refer to.

In terms of quality assurance a holistic approach is followed. Such a holistic approach is possible since each team member contributes to the quality assurance of his/her own actions, while collectively all contribute to a so-called Total Quality Management (TQM) approach (Zbaracki, 1998). No quality assurance model can be considered holistic if it is not people-centred (Sukumaran & Marcheva 2009; Živković, Mihajlović & Djutić 2009; Staines 2010).

Self-enquiry, also referred to as "appreciative enquiry" by Staines (2010:1), which is key to action research is systematic and follows a process through which we continuously learn by doing and monitoring by means of quality assurance. The purpose of such self-enquiry is to have a better understanding of oneself as a person and as a professional. The focus of the action research we execute is on professional learning and development. A holistic approach to professional development is promoted – keeping in mind that each team member is more than an individual managing his/her curriculum development activities but is part of a bigger curriculum-development-in-context picture where it is about other people and their preferences and developing their and one's own full potential by co-facilitating the processes that would make it materialise. According to McNiff (2002) action research is educational – all colleagues, from the junior lecturers to the research project managers, are offered numerous opportunities for professional learning.

Since a scholarly approach to professional learning is adapted action research is seen as the vigorous application of eclectic research methods by us as practitioners to investigate our own practices with a view to transforming such practices and to constructing new meaning. Such new meaning contributes to developing one's own practice theory – in the spirit of McNiff's (2002) idea of living theory. Applied to the context of our study, action research can be seen as the research actions all

involved take to investigate our practices with a view to acting in a positive way to the research findings and to transforming our practices. These actions are taken with a view to promoting productivity and professional learning within all participating colleagues and to constructing grounded understanding of our practices. Self-driven professional learning and learning collaboratively with other colleagues are essential for promoting a culture of professional learning and creating a learning organisation. In our context the professional learning is in essence about curriculum development. But the multidimensional nature of all our practices implies that curriculum development cannot be addressed in isolation. It is closely integrated with all the other related aspects, such as policy, facilitating learning, assessment and learning material.

Although the action research process is seen as systematic and vigorous, it is open-ended. It is a developmental process of starting with an innovative idea, implementing the idea and checking continuously if what we are doing and how it is done, is what we had initially planned. Our innovative idea is to apply the principles of Whole Brain learning to everything we do as a research team. It is simply a way that we regard as a lens for looking into our living of values, what we believe in and ensuring that we do not 'live a lie' as far as our values are concerned – in our case the essential value, apart from others, is whole brain learning. This would mean that we are enabled to come up with supportive, validated evidence for any claim we make. If the evidence is supportive, our research integrity can be viewed as being solid; if the evidence is contradictory, questions arise about our integrity and our claim to 'live the truth' – as Whitehead puts it: "living contradictions" (McNiff, 2002). Instead of a 'living contradiction' we strive to become a 'living congruence' or 'living complement'. McNiff (2002) refers to the importance of finding "ways of overcoming the contradictions so that we might live more fully in the direction of our values".

It is often said that action research is collaborative research. This implies that more than one colleague becomes engaged in the process of professional learning with the same focus. In this way all the professionals involved in our curriculum research, who already have substantial professional knowledge and skills, share what they know and engage in doing with others. New understandings are generated through professional discourse with others with the same interest. Peers engaged in such a mutual learning process learn by reciprocity. When a 'give and take' situation is negotiated, professional jealousy is counteracted. The discourse is always that of equals – "no one tells another what to do in action enquiries; we all share and value one another's learning" (McNiff, 2002).

According to McNiff (2002) the question, 'How do I improve my work?' has a social intent. When one has the intention of improve one's work it is not only for one's own benefit, but also for the benefit of others and the organisation at large – in our case it is contributing to the curriculum development activities. Improving what one is doing and gaining a better understanding of what one is doing and why one is doing it, most probably will influence other people that one encounters in a positive way.

Positive influence goes beyond practical application – it informs the process of learning from others at an abstract/ theoretical level to such an extent that new understanding brings about constructing new meaning, which in the end becomes new knowledge. This creating of new knowledge is usually contextualised, but that is what one would want from any employee who should contribute to developing/influencing others and his/her organisation.

The model for action research represented below is used as overarching model and as refined model for each of the individual sub-projects. The proposed model is representative of the actions any practitioner or curriculum developer would typically take. The model is based on the work of Zuber-Skerritt (2000). Instead of 'planning for change', as is generally used, or 'planning to improve', we prefer to use 'planning for innovation' or 'planning for transformation'.

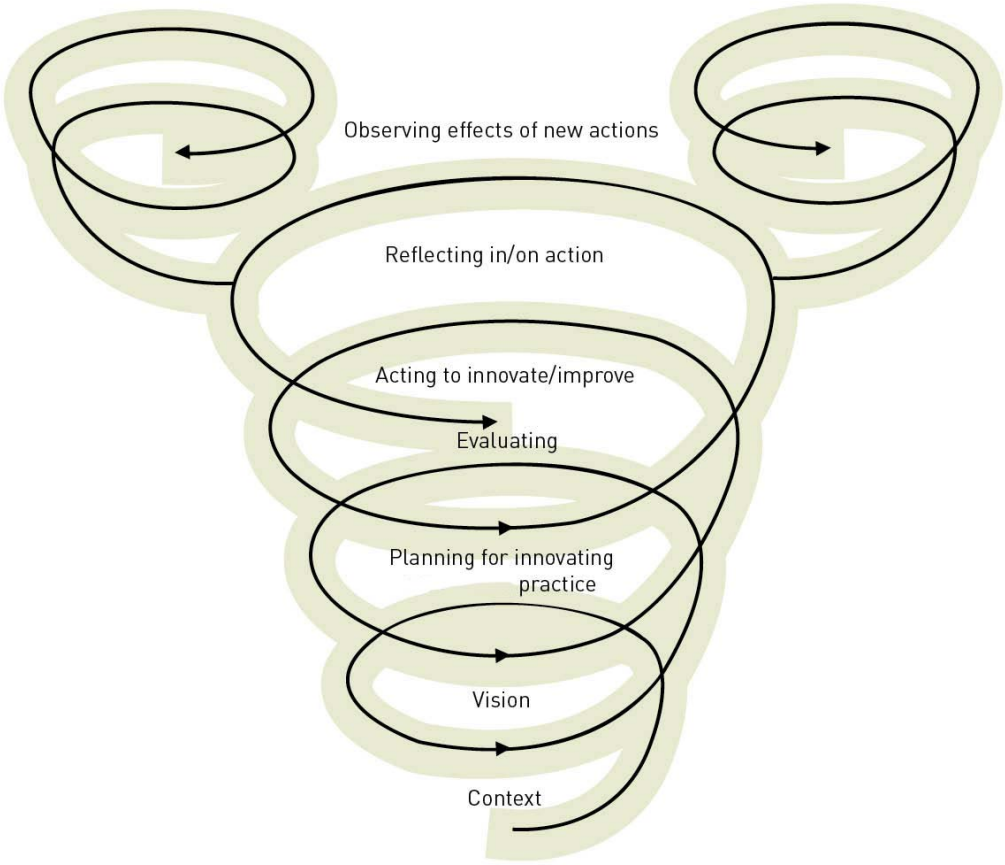
Most scholars of action research refer to problem identification (Zuber-Skerritt, 2000; Burton & Bartlett, 2005) or identifying a concern (McNiff & Whitehead, 2006) as one of the steps or as a point of departure for an action research project. Identifying a problem and formulating a so-called research problem is typical of traditional research and to us a deficit-based approach to action research. Instead we propose focusing on the assets of everyone involved or identifying a new idea. This would change action research into an asset-based approach. Especially within a visionary model one would rather work with innovative ideas in curriculum development that one would like to try out in one's practice with a view to innovating the current practice or radically transforming it. It is more about experimenting with new ideas than solving existing problems. The notion of experimenting with ideas falls under the D quadrant of the whole brain model depicted in figure 3.

The fact that problems regarding curriculum and professional development do exist and should be taken care of should, however, not be negated. Since action research is research in action while the practitioner/curriculum researcher is in action, the process of reflecting on what one does could start at any time. One could, for example, start with experimenting with a new idea; we opted for a whole brain approach to learning information literacy and during the course of executing the action research, encountered some problems. This might force the practitioner/ curriculum researcher to give immediate attention to a specific problem that has been identified. This might mean that the action researcher has to continue with the initial cycle of action research which has as focus the experiment, while another cycle should start in the middle of the initial cycle, taking the action researcher in another direction. This means that action research takes many turns. It also implies that critical reflection is multidimensional and takes many turns. Critical reflection is a scholarly skill practitioners need to acquire. Skills of reflection, according to Senge (in McGill & Beaty, 1996:195) "concern slowing down our own thinking processes so that we can become more aware of how we form our mental models and the ways they influence our actions".

The multiple cycles most action research projects consist of are depicted in figure 1. This model illustrates that action research is not a clear and neat, one-way cyclical

process as we usually find depicted in the work of action research scholars. Action research is most of the time a complex and quite messy process (Du Toit, 2009). This idea of the multidimensional turns that characterise action research is confirmed by Burton and Bartlett (2005).

Figure 1: A visionary action research model for transforming practice



(Du Toit, 2009)

Since the steps to be followed in this sequential, cyclic model (depicted by the thick line of the process in the middle) are quite obvious, they are not discussed. One has to keep in mind that the action research process only has meaning as research when new knowledge is constructed, documented and disseminated.

Ultimately those executing the action research are responsible for the quality assurance of the research report. As practitioner-researcher one has to set the criteria for judgement. The following considerations (McNiff, 2002) direct us in terms of setting criteria:

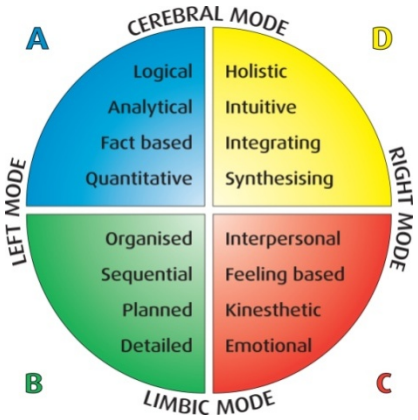
- Do you show that you are trying to live according to your beliefs?
- Do you show that you can hold yourself accountable for your claims to knowledge?
- Do you show how you have changed your own thinking and practice, and how this has possibly influenced others in terms of their thinking and practice?

By setting criteria such as these we are enabled to make professional judgments about what we have intended to change, improve, innovate, transform, which is all about our understanding, productive work and relationships. Our own professional judgment needs to be validated by others. This validation is done to ensure that our judgment is not seen as our opinion only. According to McNiff (2002) a critical friend and a validation group are needed in this regard. It is about people whose opinion one values and who are able to critique one's work. A wider community of practice has been established for this purpose. It is an internal group of specialists from different fields of specialisation throughout the University that convene on a regular basis to give constructive feedback. The common denominators are an interest in whole brain learning and action research. International experts, such as McNiff, may be co-opted as critical reader.

4 Baseline data: Brain profiling

As has been explained earlier the baseline data is adequately covered by the two pre-conference papers mentioned. However, what would be significant is to give visual representations of some of the profiles and composite group profiles of all involved. The purpose of doing so is to link this paper with other research products and to outline Herrmann's (1996) whole brain model briefly. This follows next.

Figure 2: Model for whole brain learning



In essence the model represents a metaphoric whole brain. It is divided in four quadrants, namely the so-called intellection self (A quadrant), the safekeeping self (B quadrant), emotional self (C quadrant) and experimental self (D quadrant). The left (structured) mode is categorised by processing dealing with logical, rational, critical, quantitative issues and activities. The procedural, planned, sequential and organised elements of curriculum development activities are found in the structured left mode. The curriculum development activities of the left mode are depicted in the cultural and social environment that the University of Pretoria constitutes in achievements, fact-based knowledge and traditional ways. The experiential right mode is categorised by processing dealing with visual, conceptual, emotional and interpersonal activities. In the cultural and social environment of the University the curriculum development activities of the right mode can be described as participative

and future orientated. The inclusion of all these modes in curriculum development activities comprises a full range of activities.

Curriculum development activities that implement all the modes of Herrmann's model will ensure that all participants' preferred thinking styles are accommodated and less preferred thinking modes are challenged. Such a holistic approach to professional learning is in itself an innovation. Furthermore, the transformation of the curriculum will reflect whole brain learning; and as main aim, students will be accommodated according to their preferred learning style. And as one of the purposes of a university is to develop students' full potential, the curriculum should challenge them to develop as whole brain learners and practitioners. The same applies to the full potential development of all research team members. Herrmann's model necessitates that all team members become aware of their own thinking preferences and the implications thereof for their engagement in curriculum development activities. (See data below.) Felder (1996:18) remarks: "If professors teach exclusively in a manner that favours their students' less preferred learning style modes, the students' discomfort level may be great enough to interfere with their learning. On the other hand, if professors teach exclusively in their students' preferred modes, the students may not develop the mental dexterity they need to reach their potential for achievement in school and as professionals." Analogue to this notion, if curriculum developers, including all the participants involved in our curriculum research project, design a curriculum that favours students' preferred learning style modes the students' discomfort level may be great enough to interfere with their learning. If the curriculum is designed in such a way that only students' preferred modes of learning are accommodated, they may not develop the mental dexterity to develop their full potential as professional practitioners.

The following data was gathered by means of the Herrmann Whole Brain Instrument. The assessment tool (HBDI™) consists of 120 items and is based on 30 years of extensive research on brain dominance with over 2 million learners in the database worldwide. It proves that the whole is more than the sum of the parts and therefore using different design and delivery approaches improves the learning experiences of students and the members of the research team as professional community of learners.

An application of Herrmann's model in terms of curriculum development necessitates that the entire research team become aware of their own thinking preferences and the implications thereof for curriculum development. The following serve as examples in this regard:

- For the strong A quadrant curriculum developer learning could include using data and challenging problems to solve, having rigorous debates with question-and-answer-sessions. Such a curriculum developer might also expect students to present citations and might like to involve specialists in the applicable field of specialisation.

- For the B quadrant curriculum developer learning could include well-structured activities, detailed programme material with clear instructions of where to find the information or how to execute a task. Practical concrete

examples and ample time to practise and review what learners have learned are offered.

- For the C quadrant curriculum developer learning focusing on team work or team projects and hands-on activities could be typical learning experiences. Interpersonal activities such as small group discussions and sharing personal reactions with interesting human stories are situations in which the curriculum developer feels at ease and might use that as basis for creating learning opportunities.

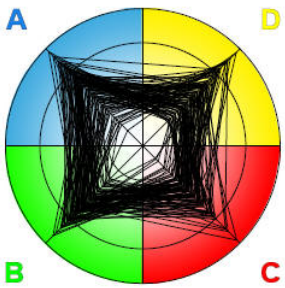
- For the D quadrant curriculum developer learning opportunities could include discovering activities using visuals and metaphors. Brain storming sessions on futuristic topics and constantly being aware of the big picture overview are activities that will be included in learning opportunities.

The Coffield research report (Coffield et al, 2004), an independent report commissioned through the University of London by the Learning Skills Council in England, was published in 2004. The report documents an investigation into the wide range of existing learning style instruments designed to identify a student's preferred style of learning.

The report evaluates the main theories about learning styles and selects the most important models from the literature. This was done by means of assessing the theoretical robustness of each model and evaluating the implications of these models for learning.

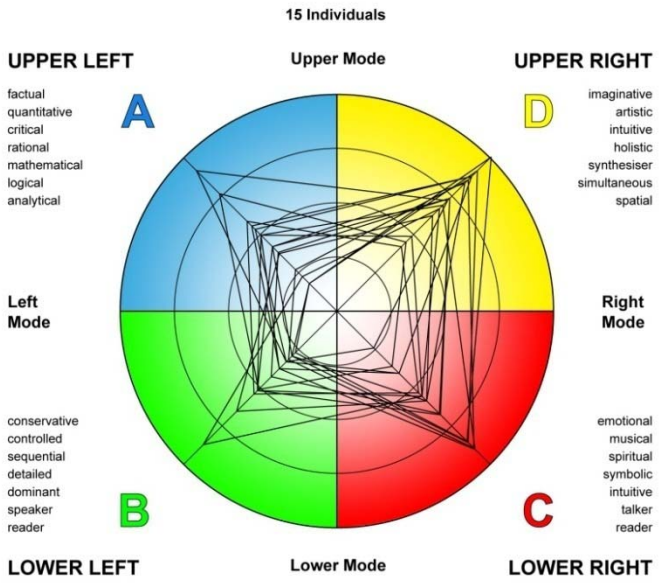
The Coffield report (2004) concludes that Herrmann's whole brain model and instrument (HBDI) is one of six recommended models in education and training. The Herrmann model not only identifies a preference for thinking within a specific mode but also a low preference for a thinking mode. This is perhaps the most significant for learning success because one of the keys to excellence in curriculum development is to find appropriate strategies to address those low preferences, some of which may be essential to success in a particular field of specialisation.

Figure 3: Composite whole brain profile of students (n=1004)



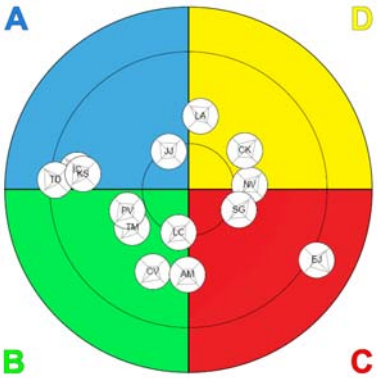
This profile provides evidence that the group of students enrolled for the Information Literacy module constitutes a whole brain. The implication is that any curriculum development initiative should address the fact that the module needs to cover all the quadrants.

Figure 4: Composite whole brain profile of the interdisciplinary team



The larger the group sample, the more whole brained the profile, as is clearly to be seen in the profile of the students. Since the curriculum development team represents a small sample of 15, the profile indicates a whole brain composite, although more dominant in the C and D quadrant.

Figure 5: Preference map of junior lecturers (n=14)



This visual representation shows a dominance in quadrant A and B. Since the group does not engage in teaching as a group, but as individuals, the individual profiles are more significant. However, what is significant about the group preference map is that the diversity within the group should be kept in mind by the academic staff developer responsible for offering the professional development workshops they

have to attend. On the one hand their thinking preferences should be accommodated; on the other they should be challenged to work outside of their comfort zones. It is imperative that the group of junior lecturers engage in as many professional development activities to develop their full potential. The lecturer coded TD should challenge him-/herself to become more flexible in terms of creating learning opportunities that will promote learning in the C and D quadrant. However, the lecturer coded EJ most probably will tend to design learning opportunities that fall in the C and D quadrant. In turn, he/she has to become flexible in order to promote learning in the A and B quadrant.

From the following visual material it is clear that the assistant lecturers are still young. The lecturers coded TD and AM are used as examples. They had to present the same chapter to different groups with a focus on 'Evaluating information sources'. The purpose of the video recording is mainly for self- and peer assessment. By assessing themselves they gather evidence for their own improvement. The data obtained is used for their respective action research cycles.

Figure 6a indicates that according to lecturer TD's brain profile he has a high dominance in quadrant A and B. This is evident in his teaching as illustrated in figure 6b. Lecturer TD is very fact-based and talks most of the time; with little opportunity for interactive learning. He attempts to structure his session by means of PowerPoint slides, but will sometimes refer to the slide and take it immediately away, or use his hand to point out something on the screen. He remains static in front of the class for the entire session, creating a distance between his audience and himself. This is reflected in his brain profile that shows that he does not have a preference for activities of quadrant C. He does not show much enthusiasm about the subject content.

Figure 6a: Brain profile of lecturer TD

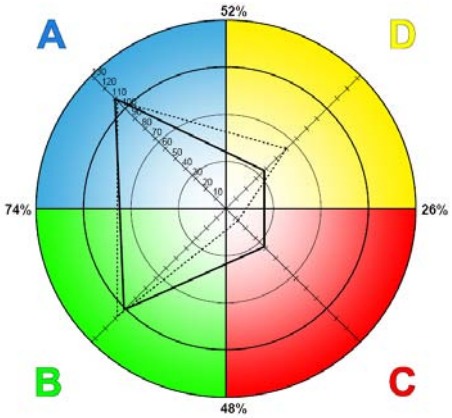


Figure 6b: Visuals of class activities of lecturer TD

Lecturer AM with a brain profile that indicates a preference for quadrant B and C (figure 7a) shows enthusiasm and engages students in group activities and interaction (figure 7b). Although not high on quadrant D she challenges herself to experiment with new ideas. This is evident in the group work activities and informal arrangements by having students sit in a group on the floor. She has good contact with her students and uses the entire classroom space. It is significant to mention that lecturer AM was formally enrolled for the professional higher education qualification, the Postgraduate Certificate in Higher Education (PGCHE) while the other assistant lecturers in the group of 16 have not had any formal training, except for a few introductory workshops.

Figure 7a: Brain profile of lecturer AM

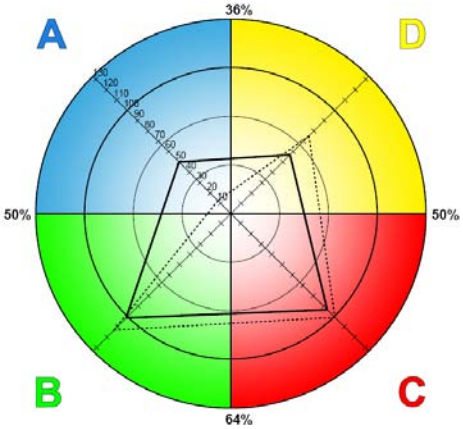


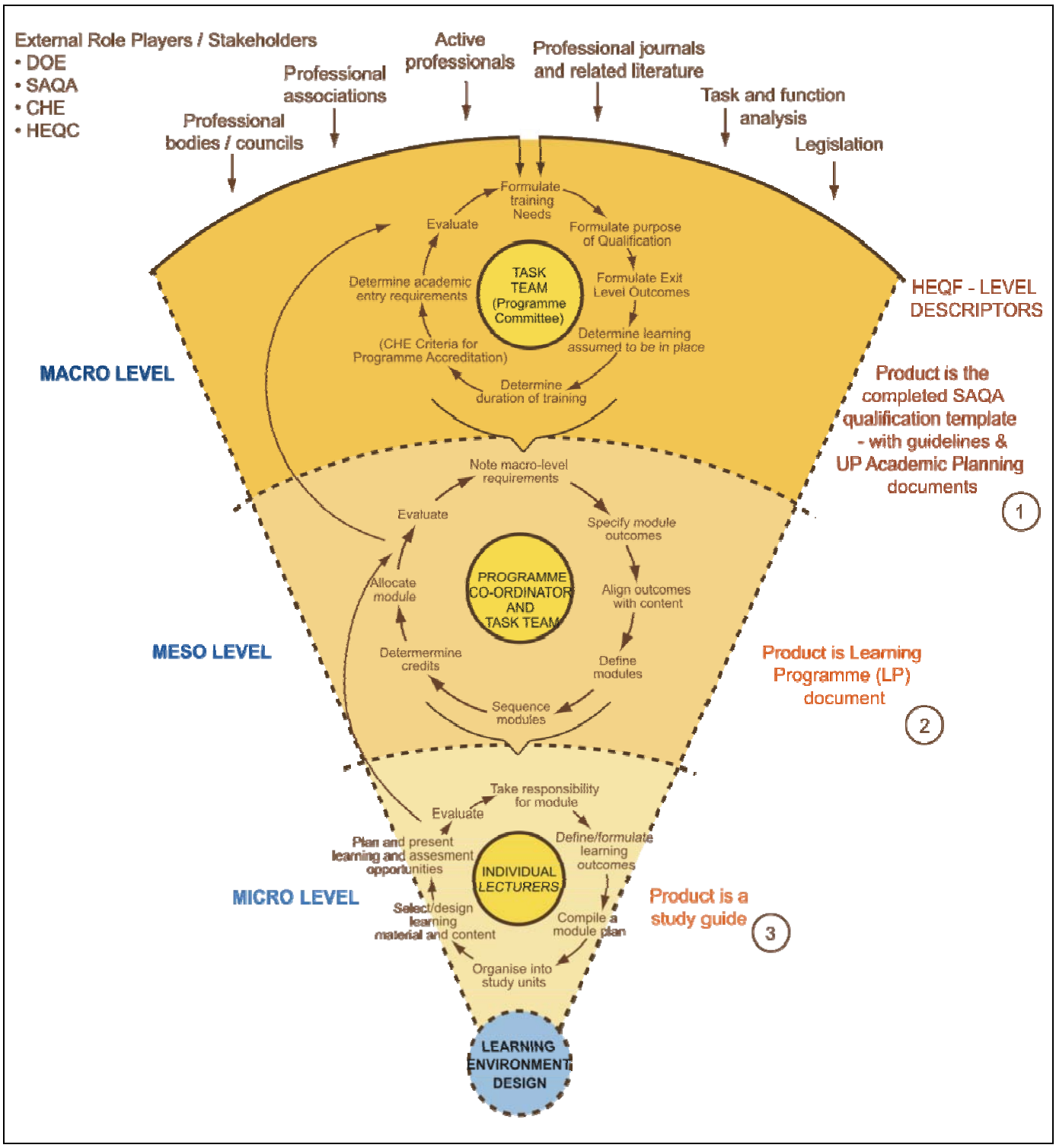
Figure 7b: Visuals of class activities of lecturer AM

5 Accountable curriculum development

The University of Pretoria recently adapted its curriculum development model that has been in use for more than two decades. The adapted model is aligned with the new outcomes-based approach to education adopted by the new democratic government in 1994. The purpose is not to discuss the model *per se*, since it is quite complex. However, it is included as a whole to indicate the Total Quality Management (TQM) nature of curriculum development. Accountability is endorsed by different policy documents and legislation as far as new quality assurance bodies are concerned. The new Higher Education Qualifications Framework, the Council for Higher Education (CHE) and the South African Qualifications Authoroty (SAQA) play an important role in accountable curriculum development. The model is divided into three levels: a macro, meso and micro level. Only the most important aspects of the last to levels as they are related to our study will be highlighted.

In figure 8 below the multidimensional aspects and activities of curriculum development are visually represented.

Figure 8: Curriculum development model (Department for Education Innovation, 2009)



At the meso level a curriculum development task team has responsibilities in terms of accountable curriculum development. It suffices to refer to the fact that the product at this level is a learning programme for each module – in our case the module on Information Literacy. At micro level the individual junior lecturers offering the module are supported by the interdisciplinary curriculum task team, *inter alia*, in terms of formulating learning outcomes and designing learning material. In fact, the entire team of senior academics design the programme, but since the junior academics are responsible for implementing it, their training is focused on enabling them to bring about refinements in order to fit their style of facilitating learning. In this way, they contribute to informing the curriculum development process in a 'bottom-up' fashion.

In order to be able to develop as a scholarly academic, each team member needs to undergo some professional development. The entire team was initially trained in applying the principles of whole brain learning as applicable to curriculum development and related responsibilities, such as facilitating learning and assessment. A separate programme is run for the junior lecturers who have to implement the curriculum. For this purpose the focus is on the following:

- Using action research for professional development
- Whole brain learning
- Innovative facilitating of learning
- Curriculum development
- Accountable assessment
- Integrating education technology

This informal training is offered on a continuous basis and is repeated annually, since the group of junior lecturers change from year to year. Usually only approximately three will remain to continue teaching on the programme the following year, depending on their own progress with their postgraduate studies. This is a limitation in terms of progress regarding this group of junior academics' professional development as university teachers.

As junior lecturers they are in the prime position to opt for an academic career. Their involvement in offering the Information Literacy module is the first step to be taken. Being involved as lecturer offers them the opportunity to do practitioner/ action research and publish the research outcomes by means of a conference or journal paper. This puts them in an advantaged position when it comes to applying for a permanent academic position.

A scholarly and action research-driven approach is followed within all training interventions, as is the case with every aspect of the curriculum research project. It is envisaged that all participants will at least contribute to one conference or journal paper as co-author. This allows for scholarly professional development of all

involved, with developing the scholarship of teaching as main aim. By using the term 'scholarly reflection' (Du Toit, 2009) we align the scholarship of practice with the idea that action research is currently transforming the traditional thinking about scholarship to the so-called 'new scholarship'.

We are proud to take part in promoting this new scholarship and to contribute to the body of knowledge in this regard. Our contribution is not only about the knowledge of the subject matter, namely information literacy, but also the knowledge of higher education as a field of specialisation and action research methodology. Our professional development therefore takes place at three levels. If Bigg's (1985) taxonomy is applied to our curriculum research project, we claim that we do not operate at a unilateral level, where it is about focusing on one relevant aspect only; instead we claim that the curriculum research is executed on the highest level, namely offering evidence of integrating different relevant educational aspects at the same time in an innovative whole – beyond the ordinary.

In the end every action of the curriculum research team has to do with professional development and becoming a scholarly reflective practitioner. A reflective approach to research is seen as an act of professionalism, and implementing the strategies of self-regulated learning. Guskey (2000:19) is of the opinion that "... educators [and support staff, such as librarians and instructional designers] at all levels must be continuous learners throughout the entire span of their professional careers. They must constantly analyse the effectiveness of what they do, reflect on their current practices, make adaptations when things are not going well, and continually explore new alternatives and opportunities for improvement."

Our intentional transformational approach to curriculum activities is that we link all we do to the principles of whole brain learning. Our claim for the necessity of using the principles of whole brain learning in all that we do stems from the baseline data – brain profiling – that is highlighted in section 4.

6 Conclusion

The literature discussed, the quantitative and qualitative data reported, and our first-hand experience in different dimensions substantiate our claim that a one size fits all approach to teaching Information Literacy is not accountable. As we use whole brain learning as lens for everything we do, we intentionally work towards a balance – a balance in terms of team efforts, curriculum development, executing action research, constructing new meaning, professional development and many more. Our ultimate aim is to create whole brain communities of practice.

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