Emerging Technologies, Innovative Teachers and Moral Cohesion

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Abstract: This paper reports on the findings of an inquiry to investigate personal convictions, social structure and relationships within the wider community that can influence the innovative teachers' pedagogical reasoning. Data was qualitatively analysed using Straussian Grounded Theory Method to articulate a substantive theory which aims to better our understanding of knowledge creation when innovative teachers use emerging technology to enhance their teaching and learning practice. The resultant substantive theory's three core components comprise of moral cohesion; innovation negotiations in context; and responsive governance as essential to innovative teachers' pedagogical efficacy when they engage with emerging technologies. The concept of moral cohesion is further expanded and forms the main focus of this article.

Keywords: emerging technologies, innovative teachers, moral cohesion, pedagogies, ethics, teacher disposition, teacher training, African renaissance

1. Introduction

The role of educational technologies in teaching and learning has evolved and changed dramatically over time but little is understood of how this knowledge manifests in practice and how novel pedagogies are replicated and shared. Pioneering, innovative teachers have developed personal theories that may potentially inform future practice once articulated and disseminated. A post-modernistic interpretive prism views the research investigation through the work of teachers qualified as finalists in the Microsoft Innovative Teachers Forum Awards (ITFA) competition. This annual competition recognises and connects innovative teachers who share a common interest in the enhancement of teaching and learning through the use of technology.

The cultural-historical context is considered as it situates the participant teachers *within a space* where the technology tools selected for use in an education environment involve the inherent burden of responsibility. The innovative teachers' educational setting includes the relationships between *participant teachers*, their *immediate school environment* which manifests itself through a range of stakeholders including learners, teachers, school leaders and the *wider social setting* encompassing parent and broader community attitudes and values toward education and ICT. Teachers continuously reflect on curricular changes as influenced

by the ideals of the information society and aim to equip their learners with the skills required to make them contributing members of this society.

2. Methodology

The study was conducted over a period of three years and data collecting instruments include meta-data consisting of educational multimedia artefacts, virtual classroom tours (VCT's), document analysis, innovative teacher workshops and interviews. *Primary research data* was obtained from SchoolNetSA and contains entries to the competition from 2007 to 2010. SchoolNetSA was established as a national organisation as a result of the efforts by volunteer educators and innovative thinkers in school networking during the 1990s.

The virtual classroom tour (VCT) as one of the data instruments used, is a universal template which was developed by the Microsoft Innovative Teachers Program. A total of 56 Virtual Classroom Tours were submitted and were included in the sample for analysis during the first phase of this research. Each VCT contextualises a project and offers insights as to the expert teacher's modus operandi to engage their learners through creative, constructivist, technology rich projects. Data collection progressed to include videotaped formal structured interviews, digitally recorded unstructured interviews and impromptu informal conversational pieces. The researcher kept a reflective diary throughout consisting of jotted down text and diagrams.

The collected data was qualitatively analysed using Straussian Grounded Theory Method to articulate a substantive theory which aims to better our understanding of knowledge creation when innovative teachers use emerging technology to enhance their teaching and learning. Initially all data collected was analysed through coding techniques. Descriptive quotes were identified for use during the discussion of the findings and a list of all generated codes was compiled. During the theoretical sampling, opportunities were used to expand the list of codes and to seek greater clarity on concepts through reflecting on informal conversation pieces, interacting with participants in workshops and engaging selected innovative teachers for unstructured interviews until theoretical saturation was achieved. The list of codes was systematically whittled down as redundant codes were dismissed and similar codes were grouped together into themes. Literature was revisited in a constant comparison manner and incidents of exception were explored. To manage the large quantity of data generated by a Grounded Theory study, a methodical approach is recommended for the systematic analysis to proceed fluently. During a Grounded Theory study, *data analysis* and *data reduction* takes place iteratively. Finally, through a process of concept formation, the categories were mapped and a theory emerged.

3. Findings and Discussion

3.1 Moral Cohesion

Moral cohesion is a multidimensional concept that is derived from the term *social cohesion* that supports the concept of an integrated society that shares the same ideals and values. The notion of moral cohesion was borne out of the suggestion that being part of a community pre-supposes that one subscribes to its ideals and belief system which is governed by common values and motivations that guide people in their actions. The idea of moral cohesion is further articulated as "collective well-being, that offers a means to achieve an individual end and not a collective measure to advance solidarity and moral cohesion around the imperatives of creating a just and equitable society [1, p. xv]."

The emerging theme *moral cohesion* is presented in Table 1 along with its sub themes. The emerging theme and sub themes are a result of analysing the data through a process of open

coding, concept formation though axial coding and finally concept development through selective coding.

AXIAL CODING (Categories clustered in sub themes)	SELECTIVE CODING (Emerging themes derived from sub themes)	CORE CATEGORY
African renaissance	Professional Burden	Moral Cohesion
Stewardship		
Ethical considerations		
Teacher disposition	Teacher as Bricoleur	
Teacher training		

Table 1: Building theory: Moral cohesion as emerging core category with expanded themes

Once the categories emerged an affinity diagram was developed through the use of axial coding. The interrelationships amongst the categories were determined through interviewing select finalist in the Microsoft Innovative Teachers Forum competition and the categories were subsequently classified as drivers, links or outputs. Arrows between the categories identify the nature of the relationship and indicate the direction of influence. The resultant interrelationship diagram, depicting moral cohesion as a core category, is presented in Figure 1 below:
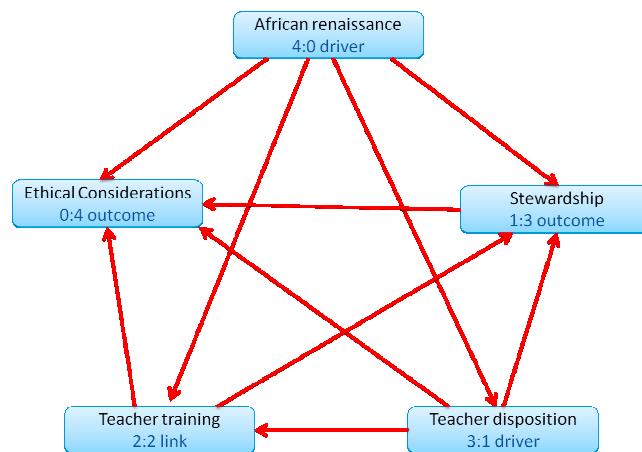

Figure 1: Interrelationship diagram of Moral cohesion

The ratio of arrows flowing in or out of sub themes determines the strength in relation to other categories and is therefore identified as either a *driver*, *link* or an *outcome*. *African Renaissance* and *teacher disposition* is identified as the strongest drivers. *Teacher training* forms the link between the strong drivers and the outcomes manifest as *Stewardship* and *ethical considerations.*

3.2 Professional Burden

The theme of *professional burden,* as emerging from the analysed data, consists of the sub themes *African renaissance, stewardship* and *ethical consideration.*

3.2.1 African Renaissance

The concept African Renaissance was placed on the world agenda by the former State President of South Africa, Thabo Mbeki in the mid 1990's. It promotes the notion that the nations and people of Africa, being intimately familiar with their current challenges, can work

together to combine African knowledge and values of solidarity towards renewal in economic, scientific, cultural and educational spheres. African ministers of education, from across the continent, met in 1999 and stated:

> *"We are more convinced than ever, that education is the sine quo non for empowering the people of Africa to participate in and benefit more effectively from the opportunities available in the global economy of the 21st century"* [2, online].

In addition, the ministers stressed the developing of:

> *"non-formal strategies for reaching disadvantaged children, including street and working children and refugees; making curricula more relevant to local cultures; promoting use of the mother tongue in the early years of primary education and in adult education; integrating education into the family, community and workplace; and involving teachers and their unions in the development of the teaching profession"* [2, online].

To achieve these ambitious priorities within the closed educational system requires investing in the development of human capital in the form of administrators, teachers and learners. Increasing their self-esteem and their wellbeing through a consciousness to inspire free inquiry; to inspire free criticism; and to inspire a new confidence in the possibilities of human thought and creation [3, 4].

Gruner [5, p. 16] captures the positive sentiment: "South Africa is still maintaining an astonishing spirit of hope, optimism, perhaps even euphoria, as far as the idea of overcoming poverty and misery by means of technology is concerned." The widespread conviction amongst teachers and policy makers is still that the integration of technology into the education system will solve other social problems and catapult the African people into the information society. The disconnect between policy and practice and the largely unsuccessful efforts to implement large scale solutions is well documented, however, the innovative teacher as individual within the education system stays true to the ideals of the *African Renaissance* and finds unique ways to harness resources from within the community to achieve their objective of emancipating learners through the use of emerging technologies.

3.2.2   Stewardship

The general core duties of teachers are to plan, prepare and execute an instructional program aligned to the national curriculum statements for the subject areas they are responsible for. To this aim they are required to provide learning materials, instruct, assess, keep records updated, manage learner behaviour through a code of conduct, participate in extracurricular activities and interact and communicate with parents and caregivers. Other duties are of a pastoral nature as they not only look after their learners' academic needs but also their social wellbeing. Teachers are also required to invest in themselves and participate in staff development activities so that they can continually review their own methods of teaching and keep abreast of developments in their own subject area [6].

The general understanding of the idea *stewardship* is to be held responsible for something or to tend to the needs of someone or a cause that has been entrusted to one's care. Within the confines of this article, the concept of stewardship means that innovative teachers feel responsible for and tend to the needs of the learners in their care to develop them to their full potential so that they can contribute to their own communities. The concept of stewardship can be expanded to include expert members of the community in an effort to include their indigenous knowledge systems, so increasing community involvement in teaching and learning.

Innovative teachers extend their traditional teaching duties to address problematic issues within their community and henceforth reach out to its members in a joint effort to build a cohesive society. Community experts are approached and strategies to harness their capability and know-how are devised in an effort to incorporate their knowledge into learning projects.

This gives recognition to the elders and community leaders and so indigenous knowledge is treated as a valuably rich resource. Indigenous Knowledge Systems (IKS) can be defined as knowledge that is unique to a given culture or society. Decisions are based on local knowledge which in turn is *"dynamic and continually influenced by internal creativity and experimentation as well as contact with external systems"* [7, p. 479].

Innovative teachers and their learners are also confronting their internal creativity. Because of their exposure to a variety of technologies, and the world outside their community, they continually amend their personal knowledge systems but still rely on their community for input and support. At the same time community involvement allows learners to develop a healthy respect for their neighbourhood and a sense of inclusiveness. This process leads to a strengthening of the social fabric of a particular society.

This focus on community issues was initiated by Jaramillo [8, p. 51] when he states that *"teachers are encouraged to facilitate, to create, and to see themselves as participants within the community."* Because innovative teachers are members of a community, they share the burden of localised problems in the area. These teachers use their position in society to mobilise action.

3.3   Ethical Considerations

Pressures brought on by the information society are directed from three differing perspectives are influenced from within the theoretical, political and the everyday prosaic perspectives. When considering all three perspectives, the political narrative is currently the strongest as reflected in policy documents articulating the South African vision for ICT in 2015. The development narrative continues with the emphasis on entrepreneurial and research skills to build capacity and address local and global challenges [9]. In contrast to the governmental organisational structure and its agenda, innovative teachers are ensnared within the everyday prosaic, unstructured and utopian perspective. In this space there is an onslaught of technologies bringing with it a range of ethical concerns. At the same time teachers struggle to come to terms with the ethical choices they are forced to make in the execution of additional obligations. Gruner indicates the importance of ethics stating:

"Innovation in Technology has triggered Innovation in Ethics, because the "old" ethics was not sufficient to cope with the moral problems of a "new" world created by the advent of new technology" [10, p. 18]. Ethics, in relation to this research, include determining codes of conduct, rules, policies and procedures in the formal learning environment and, in an increasing fashion, to the informal learning environment.

The full impact of using emerging technology for the purposes of teaching and learning can never be fully predicted. There are *unintended consequences* as each emerging technology reshapes previous parameters. One field of applied ethics that resonate with this study is the *ethics of responsibility* as articulated by Ströker in Gruner [10, p. 19].

When engaged in the art of teaching and learning with technology, teachers are required to be responsible in carrying out their duties and in turn they cultivate this notion of *acceptable behaviour* in their learners. The act of being responsible in the use of emerging technologies inherently include the ethics of the future, social, nature and democracy in an attempt to mitigate the unintended consequences that could transpire in the unfolding of the innovative project. In every situation where *responsibility* is demanded, it must also be clarified *who* is liable, for *what*, and to *whom*. Thus the issue of power re-arises in the question: What means of sanctions are available against those who have not honoured their responsibilities?

Thus considerations are given to the personal and learner owned devices selected for voluntary use in the classroom. Teachers grapple with issues such as availability of such devices, whether they can reflect on their practice in open forums and have an open opinion on

events taking place within and outside of the classroom. In the case of learners they lament the lack of guidance from authorities as most responses seem to be knee-jerk reaction to a controversial issue that involves the inappropriate use of mobile phones by learners. Authorities offer little proactive guidance and therefore no real support.

Another concern that needs to be dealt with is how to manage the parents' expectation, especially with regard to the use of their child's mobile phone for teaching and learning purposes. To prevent the potential loss of using new devices in teaching and learning, innovative teachers are going to great lengths to manage the fears of parents and the school community and put mechanisms in place to educate their learners in the responsible use of their own and other connected devices. Before using technology in the classroom attention should be given to issues relating to social and ethical issues:

"Identifying and addressing safety and ethical issues as an integral part of a teacher's role in preparing digitally literate citizens to use technology within the networked global community in a safe and socially appropriate manner, must be viewed as a keystone supporting wise and thoughtful practice in the networked classrooms of the 21st century. Promoting responsible practices will occur only through the explicit preparation of teachers who are aware of what they are doing, as opposed to those who are not" [11, p. 480].

One of the stumbling blocks to the explicit preparation of teachers is the problem of *currency* as technology is very dynamic with new solutions and devices continually being released into the market. Guidelines which were appropriate for established practices soon become irrelevant and outdated. The prolific use of social media brings about new habits and therefore new inherent dangers emerge. Generic guidelines are therefore necessary and they should remain flexible enough to grow with technological capabilities and new practices in the learning interactions.

The data analysis revealed an uncertainty amongst teachers regarding appropriate ethical conduct when allowing new technology into their teaching and learning spaces which was previously reserved for more traditional and widely accepted forms of educational technology. Due to a lack of structure and guidelines from governing authorities teachers navigate ethics in their practice by articulating their own set of practical rules to guide themselves and their learners. They try to keep these guidelines generic and fluid in order to accommodate new technology developments and move from a *rules based system* of governing to a *value based system* [12]. In this way teachers inadvertently include Gruner's Ethics of responsibility which emphasises social and future ethics in their course of action.

3.4   Teacher as Bricoleur

Teachers are knowledgeable in the art of using *whatever means* and *whatever is at hand* to reach pre-determined learning outcomes in challenging contexts. As a result they have been described as *bricoleurs* in relation to their craft [13-15]. This behaviour is not new or unique to the teaching profession but in relation to this study it encapsulates the original ideas of the anthropologist Claude Lévi-Strauss [16, p. 18].

When innovative teachers engage in the task of designing projects wherein emerging technologies are to be incorporated, they take into account the repertoire of skills which they have accumulated in the course of their teaching careers. Even though the technology they will be using is new to them and they have not fully anticipated the results of using it in the classroom, they are confident in their ability to solve problems and the challenges they present. This is a skill they do not only require from their learners but also apply to themselves and in collaboration with learners they deliberate the best solution for a given task.

Thus bricoleurs focus their attention on addressing the complexity of the lived world and understand the reality that the knowledge they produce should not be viewed as a trans-

historical body of truth. In this framework, knowledge produced by bricoleurs is provisional and subject to change. Teachers continually augment their understanding as their access to more diverse technologies increases. Bricoleurs know that tensions will develop in social knowledge as the understandings and insights of individuals change and evolve [17].

The process of using technology for creation, remixing and sharing is bound together by a set of possible relationships and teachers, in collaboration with their learners, find new ways to benefit themselves and their communities. There is little regard for perceived correct procedures but teachers and learners are pragmatic and more focused on the completion of the task. Judgments are made on the premise of pre-existing knowledge as to their learners' capabilities, their skill levels and the affordances of the emerging technologies they are considering for use. Trust on the other hand is built up over a period of time and it is forged through teachers' relationships with those involved in the learning event.

3.4.1 Teacher Disposition

The definition of *disposition*, within the realm of social foundations in education, should be shaped by John Dewey's idea which enhances both the intellectual and social growth of teachers and thus helps them to acquire characteristics that support their teaching activities [18]. Teacher disposition has a strong influence on student learning and development.

Teacher outlook, prior life experiences and beliefs influence their participation in ICT related initiatives. According to Nespor (1987, p. 19) as cited in Li and Hughes-Wilhelm [19] *"Beliefs are far more influential than knowledge in determining how individuals organize and define tasks and problems and are stronger predictors of behaviour."* Richardson, Anders, Tidwell and Lloyd [20], later supported by Webb and Cox [21], found that a change in beliefs preceded a change in practices. The implication therefore is that studying teachers' practices will give us a glimpse into their belief systems.

The implementation of innovations in the teaching practice is a comprehensive process and requires continued enthusiasm. Teachers look for support from their learners whose affirmation they highly value [22]. The overall worth of teachers is reinforced by positive comments from their learners. This particular learner, participating in the project *My community my Pride,* explains how his regard for himself and his teacher changed in a positive way. He says that his respect for himself and his teacher has grown in the course of the project:

> It was an interesting and encouraging project, as I've learnt many things. This project also helped me to know and identify the class and type in which my community falls. Working with people made me a well known person within my community. It also helped me practice and gain many skills that will help me in the workplace. It was like I'm doing a certain course in which I will be something after it. This took me from being lowest to highest. "God is the first factor that can take you from zero to hero "But" Mrs Mfeka is the second factor - Mfeka Hlengiwe, VCT 2009.

Teacher initiative and change does not only depend on their own capabilities but also on their interactions with external incentives and opportunities. Outside elements of policy, professional and public are filtered through the teachers' own personal beliefs, knowledge and dispositions before enacted in their reformed practice.

3.4.2 Teacher Training

By nature training courses and materials are prepared long in advance to training events and in a fast changing environment, where technology is involved, the struggle to stay current becomes problematic [23]. Teachers that have been in service for a number of years have not had any formal training in computer literacy skills, or for that matter integrating technology into their curriculum. To make up for their lack of skills they avail themselves on a smorgasbord of training opportunities that come their way, however they find it difficult to judge the currency of content or the relevance of training courses as skill levels amongst

teachers differ and current training programs do not adequately cater for personalised levels of learning.

Innovative teachers report that they have built their particular skill set over a number of years though a combination of formal ICT training events as well as serendipitous exposure to a number of different training opportunities. Not all of these opportunities were related to ICT but rather inspiring incidences that sparked their creativeness. Prior exposure to ICT in personal and professional life and learning histories influence strategies adopted for utilising technology for teaching and learning.

In the formal domain teachers exploit every training opportunity but they choose their events carefully to complete the perceived gaps in their skill set. The main areas of concern is the need for further training and the resultant emancipation of the teachers through increasing their self esteem and minimising the fear of technologies and thereby addressing notions of inadequacy.

Over time, the ideas of social pragmatists such as Dewey, have garnered greater attention and have been adapted into various teacher education efforts to make the classroom more experiential, less teacher centred and more sensitive to the realities and experiences of students. In short, greater focus has been given to the creation of cooperative communities where learners come together to problem solve, experiment and develop both moral and academic reasoning as Molefe indicates:

> As a teacher and environmental activist I am passionate about the use of technology in teaching; especially teaching of subjects related to environment and I believe that learning is a three legged pot (the learners, the community and technology) and that efficient learning requires the involvement of the three in order for learners to achieve (Moliehi Molefe, VCT 2009).

4. Conclusion

In the core category of moral cohesion, teachers expressed a strong sense of kinship with the people of Africa and aligned their ideals with those of the African renaissance movement. Innovative teachers take into consideration their position in society and contemplate their way forward when engaging in teaching and learning activities that involve the use of new technologies. They strive, through their projects, to uplift and enlighten their fellow teachers and the learners in their care by expanding their horizons. Towards this aim they rely on members of their community and activate their own personal network of contacts that stretches beyond the education sector.

Innovative teachers' perception of the professional burden they carry along with their bricoleur attitude allude to them using whatever means and whatever is at hand to equip learners with the skills required to make them contributing members of their community and the information society. Strategies for the constant renewal of pedagogical practices and the need for reflexivity included the appropriation of learners' personal devices for learning where their disposition had to be carefully managed in accordance with ethical considerations and their various capabilities. Innovative teachers are powerful change agents within their school environments and in this regard a certain amount of freedom could be offered to innovative teachers to further explore their own practice whilst at the same time tasking them with additional responsibilities in growing organisational capabilities. Innovative teachers use their increased status and power within their schools to actively lobby for policy changes through participating in advisory committees and assisting in the drafting of documents that hold strategic, ethical and practical implications for the exploitation of emerging technologies within their schools. They also gradually build their skills set through the pursuit of formal and informal training opportunities and struggle with difficulties such as personal resources and level of availability and support to their learners after school hours.

This article covered the component of *moral cohesion* which became evident through analysing data delivered through various data instruments. The themes of *professional burden* and *teachers as bricoleur*s were presented and expanded upon in the form of quotes and references form literature. The interrelationship between the sub themes prioritised *African renaissance* as a key driver with *teacher disposition* as a partial driver. *Teacher training* was seen as the enabling mechanism resulting in sense of *stewardship* and the resultant *ethical considerations* that needs to be taken into account when engaging with emerging technologies within the pedagogical space. Finally, the following statement captures the sentiments of moral cohesion: *"It cannot be only self-interest that motivates teacher educators, but a moral and ethical imperative to provide service to a citizenry in addition to the knowledge and technical skills that make education possible"* [8, p. 45].

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