

Moving sciences beyond museums and theatres

Authors:

Jugathambal Ramdhani¹
Sarita Ramsaroop²

Affiliations:

¹School of Social Sciences,
University of KwaZulu-Natal,
South Africa

²Department of Curriculum
and Instruction, University of
Johannesburg, South Africa

Correspondence to:

Sarita Ramsaroop

Email:

saritam@uj.ac.za

Postal address:

21 Eastwood Lodge, Phillips
Road, Beyerspark, Boksburg
1459, South Africa

Dates:

Received: 05 July 2011

Accepted: 22 Nov. 2011

Published: 16 Nov. 2012

How to cite this article:

Ramdhani, J. & Ramsaroop,
S., 2012, 'Moving sciences
beyond museums and
theatres', *Koers – Bulletin for
Christian Scholarship* 77(1),
Art. #32, 6 pages. [http://
dx.doi.org/10.4102/koers.
v77i1.32](http://dx.doi.org/10.4102/koers.v77i1.32)

Note:

This article was developed
from a paper delivered at
the Koers-75 Conference on
'Worldview and Education',
held in Potchefstroom, South
Africa, from 30 May to 02
June 2011.

Hierdie artikel is 'n verdere
ontwikkeling van 'n
voordrag gelewer by die
Koers-75 Konferensie oor
'Worldview and Education' in
Potchefstroom, Suid-Afrika,
vanaf 30 Mei tot 02 Junie
2011.

© 2012. The Authors.
Licensee: AOSIS
OpenJournals. This work
is licensed under the
Creative Commons
Attribution License.

Recent literature suggests that art and aesthetics are evident in ancient times, as well as in Islamic, Indian, Chinese, African and Western medieval traditions. However, literature on the incorporation of art and aesthetics into economic and management sciences and social sciences is not so readily available. Using a narrative exploratory study, this article reported on two lecturers' interpretation of the sensory contemplation or appreciation of aesthetic judgement within their academic programmes at a higher education institution. Stimulating creativity, passion and imagination is just part of an array of characteristics that prospective educators will need to develop in their teaching. Research has indicated that to become a reflective practitioner, educators should be able to assess and explore the success of their practices. It is this freedom to imagine, assess, explore and reflect continuously on new ways of doing things that leads ultimately to practical application. Teaching aesthetically also requires a strong grounding in pedagogical content knowledge, thereby allowing students to become transformers of society. The main thrust of this article was to determine how we develop and embody these qualities in ourselves and in the modules we teach. The results of the study indicated that whilst early socialisation processes did impact on how aesthetics was incorporated for one participant, culture did not play a very significant role for the other. The findings also indicated that students have a real appreciation of the incorporation of the aesthetic domain within the disciplines.

Wetenskap: soveel meer as museums en teaters. Die jongste literatuur toon dat kuns en estetika in antieke, Islamitiese, Indiese, Chinese, Afrika en Westerse Middeleeuse tradisies voorgekom het. Inligting oor die inkorporering van kuns en estetika in sosiale wetenskappe en ekonomiese en bestuurswetenskappe is egter nie so geredelik beskikbaar nie. Hierdie artikel doen verslag oor twee dosente se vertolking van die sensoriese beskouing of waardering van estetiese oordeel in die akademiese programme aan 'n hoërondewysinstelling deur middel van 'n narratiewe, verkennende studie. Om kreatiwiteit, passie en verbeelding te stimuleer, is maar 'n paar van 'n reeks eienskappe wat voornemende opvoeders in hul onderrig moet ontwikkel. Navorsing het getoon dat om 'n nadenkende praktisyen te word, moet opvoeders in staat wees om die sukses van hul praktyke te assesseer en ondersoek. Dit is hierdie vryheid om voortdurend nuwe maniere om dinge te doen te bedink, assesseer, verken en daarvoor na te dink wat uiteindelik tot die praktiese toepassing lei. Om esteties te onderrig, vereis ook grondige kennis van die pedagogiese inhoud ten einde studente in staat te stel om transformeerders van die samelewing te word. Die hoofdoel van hierdie artikel is om te bepaal hoe ons hierdie eienskappe kan ontwikkel en in onself en die modules wat ons onderrig, kan vergestalt. Die bevindings van die studie dui daarop dat hoewel sosialiseringprosesse 'n invloed het op hoe estetika vir een deelnemer geïnkorporeer is, kultuur nie 'n beduidende rol vir die ander gespeel het nie. Die bevindings dui ook aan dat studente opregte waardering het vir die inkorporering van die estetiese domein in die verskillende dissiplines.

Introduction

The purpose of education is not to prepare children for future responsibilities but for a life lived in their time, such that they 'develop habits of conscious and reflective experience' (Dewey, in Gaudelli & Hewitt 2010:88). A combination of experience and focused thinking would serve to generate more learning and encourage critical thinking about the society in which they live (Gaudelli & Hewitt 2010:88). Learning from experience is Dewey's idea of a transformative, aesthetic experience (Goldman 2010:8). The ability to question stimulates thought and creativity (Dewey, in Gaudelli & Hewitt 2010:90). The thought process leads to imagination and reflection, which leads ultimately to practical action (Goldman 2010:8). Imagination links meanings from past experiences to our understanding of the present (Dewey 1934).

However, much of our language, thoughts and actions are embedded in our cultural inheritance (Ganger 2006:64). Socially constructed categories of social experiences – including race, gender,

sexual identity, religion, physical and mental abilities, and socio-economic class – need to be understood through the lens of creations of specific cultures embedded in a unique historical environment (Adams 2000:2). The manner in which we are socialised can therefore influence our thoughts and creativity.

In this article, both the researchers/authors are Indian and female. Although both come from the same religious background of Hinduism, the spoken language of each differs. The Economic and Management Science (EMS) lecturer (now University of KwaZulu-Natal) belongs to the Tamil linguistic group and the Social Science (SS) lecturer (now University of Johannesburg) belongs to the Hindi linguistic group. As suggested by Cote (1996:412), culture does influence personality traits and the development of character. Cote (1996:421) also identifies personal identity as being shaped by the lived experiences of individuals.

The task of the teacher is then to design learning experiences that will enable students to develop their own capacity for understanding by taking into consideration the value of diversity and by being able to draw from diverse cultural elements to craft their practice (Lubig & VanAbel 2010:4). Promoting student-centred and activity-based learning by incorporating learning through visual, auditory, kinaesthetic and tactile means would result in activities becoming more issue-focused, relevant, practical and skills-based, providing opportunities for students' investigation and communication (Palmer & Neal 1994:29). It is therefore important for teachers to explore different teaching techniques so as to ensure that this thread of learning is captured at its optimum. This would involve teachers questioning continuously the success of the strategies employed in the lesson and making the necessary revisions and improvements, where applicable. Being able to reflect continuously on the success of the lesson through the lens of aesthetic understanding by students would result in students being able to merge classroom learning with real life experiences. Giroux (in Uys & Gwele 2005:11) provides a convincing argument about the role of schooling in reproducing existing society versus being able to 'challenge the social order to develop and advance its democratic imperatives'. There is a lack of current research promoting teacher understanding of the concept of aesthetics and methods of teaching aesthetically. This leads us to our research question: 'How do we infuse aesthetic elements into the modules we teach and into our lectures?'

How often do students question the importance or relevance of what they learn at school? Common responses to this include: 'It is helpful in finding a job and being a meaningful contributor to society', or 'You need to write an exam on this content'. We do not dispute these responses, but it would be equally important to know and understand purely for enjoyment and enlightenment. On the basis of the literature consulted and the concerns of two lecturers, this article was undertaken to understand two academics' experiences of aesthetics in SS and EMS, respectively, drawing on the tenets of narrative qualitative inquiry.

The research approach followed was mainly qualitative because we felt that using this methodology would provide us with a description 'from the inside out'. In other words, it would give us adequate insight from the point of view of the people who participate in the teaching of the module. By so doing, it provides the researchers with a holistic view, with regard to 'processes, meaning, patterns and structural features'. To this end, this study was a narrative interview of the perceptions of the EMS and SS lecturers in the Department of Curriculum and Instruction of the Faculty of Education. (From this point onwards, the EMS lecturer will be referred to as the EMS participant and the SS lecturer will be referred to as the SS participant.) The aim of the study was made clear to both participants during the narrative inquiry and the participants served as both researchers and narrators.

This qualitative methodology that drew on the narrative inquiry was a seductive selection as it provided rich description and explanations of the processes that occur in the EMS and SS modules. It created anticipation for the narrators' 'use of context to connect and situate' their particular experiences with the adoption of aesthetics in their particular modules (Kramp 2004:105).

This particular approach gave 'voice' to the EMS and SS participants as both storyteller and researcher. Through narrative analysis, as researchers, we were able to retell the other's story; in 'restoring' the narratives you receive, you return the stories to your participants (Kramp 2004:120). We asked each other to review the work that was produced as a result of the narration, thereby demonstrating a sense of respect for each other. The EMS and SS participants were selected purposively. The rationale for this sampling was to test and report on the process of socialisation and its relationship to thought and creativity, as indicated in this introduction. As researchers, we were cautious to ensure that reporting correctly meant being as objective as possible, whilst being aware of the subjectivity surrounding the research setting (Olson 1995). This is verified in the section below which highlights the process followed during data collection. The following paragraphs will support Dewey's interpretation of aesthetics and its implications for classroom practice, from a teaching and learning perspective.

Theoretical perspectives based on literature

Dewey's interpretation of aesthetics supports our argument for the use of cognition and senses in teaching EMS and SS. The literature consulted for this article focused on the meaning of aesthetics.

Meaning of aesthetics

The notion of aesthetics goes back to the 18th century, where the focus seemed to be predominantly on art and on ideas of the 'beautiful, the sublime and the picturesque' (Carlson 2003:4). Dewey also perceived objects of art as a source of

aesthetic experience, created intentionally to invoke and to heighten the experiences of the observer (Ganger 2006:46). Dewey, however, also acknowledged that art was not the only avenue through which the aesthetic was attained (Ganger 2006:46). He argues that aesthetics can move beyond museums, towards a practice of social discourse (Gaudelli & Hewitt 2010:83). Meaning is socially constructed, with the thinking process involved having a direct correlation to this social construct (Goldman 2010:5). This is in direct contrast to Baumgarten (in Salah & Salah 2008:4), who argued for aesthetics 'as the science of perception', indicating that there is a 'polarization between the intellect ... and the senses'. A discussion or debate therefore has the potential to be experienced as aesthetic (Gaudelli & Hewitt 2010:83), thereby refuting Baumgarten's (in Salah & Salah 2008:4) claims that 'cognition was held to be superior to perception'. The internal emotional satisfaction and fulfilment that is acquired through such experiences leans towards aesthetic experience (Dewey 1934). Dewey (in Gaudelli & Hewitt 2010:85) also believed that everyday life and common experiences can be interpreted as aesthetic experiences.

Motivation for the incorporation of aesthetics into sciences

Teaching in the South African context, as in many countries in the world, is exam driven. Many teachers rush through with the aim of completing the prescribed content within a specified period of time. Teaching in this manner results in little thought for creativity and passion, leaving students feeling quite unmoved and not experiencing amazement and wonder in the learning experience. The problem is exacerbated further by teachers' lack of epistemological and pedagogical skills to teach their area of specialisation effectively (Department of Education 2007). The Department of Education (2007:24) has acknowledged that a large majority of teachers still need to strengthen their subject knowledge base, pedagogical content knowledge and teaching skills in the subjects they teach.

A good teacher is one who has a strong content base, an understanding of how best to teach that content, and knowledge about teaching and learning processes in the subject they teach (Shulman, in Gravett & De Beer 2010:3). Shulman (in Gravett & De Beer 2010:3) coins the term 'pedagogic content knowledge' in describing the above. David's (2005:60) description of teaching tends aesthetically to echo closely the sentiments of Shulman. We would further add that teaching using these principles can bring about aesthetic experiences by students in the classroom if the teacher infuses passion and imagination into his or her planning and implementation. We argue that a teacher may be equipped with the content knowledge and strategies to teach the content. However, without creativity, passion and imagination to be able to fuse the two in order to present a lesson that would mesmerise and leave students in awe, reaching aesthetic heights would be difficult to achieve. This is in keeping with the critical theorists who argue that critiquing 'society, its structures and their reproduction' (Beatty,

Leigh & Dean 2009:110) forms an important component of reflection and change.

From the preceding discussion, it is evident that if we are to develop these qualities in our prospective educators, we therefore need to embody these very qualities in our own courses, which are, for the authors, respectively the Economic and Management Sciences and Social Sciences.

Teaching for aesthetic understanding

Dewey's description has also expanded beyond the emotional and affective reactions to aesthetics. A truly aesthetic moment is being able to witness how different elements are able to operate in harmony to bring together a completed whole (Gaudelli & Hewitt 2010:87). Feynman's (in Girod, Rau & Schepige 2003:577) interpretation of aesthetic understanding was similar to that of Dewey's by maintaining that an aesthetic understanding is a 'rich network of conceptual knowledge combined with a deep appreciation for the beauty and power of ideas that literally transform one's experiences and perceptions of the world'. Both of these scholars agree that in order to have an aesthetic experience, a holistic understanding of the object, event or experience is necessary. Transferring this understanding of aesthetics to the classroom would require viewing teaching as a craft, with its actual implementation as an art. Teaching is essentially axiological: 'it is grounded in ethical and aesthetic values' (Lubig & VanAbel 2010:2), which require imagination, passion and a good grasp of the content knowledge and techniques on how best to teach this. The aesthetic accentuates aspects of wonder and beauty that emerge, spontaneously and unrehearsed, in the process of education (David 2005:60). The role of the teacher is to connect the subject matter to the desires and needs of the students and, at the same time, help the students to consider their moral responsibility towards society (Goldman 2010:8). Critical theorists encourage students to 'develop a heightened awareness of themselves in socially grounded roles and the demands placed on them therein' (Beatty *et al.* 2009:110).

The advocates of critical curriculum theory claim that the outcomes of education should enable students to transform society by thinking critically, making informed decisions and thereby acting upon these decisions to improve the quality of life (Uys & Gwele 2005:11). In this way, teaching and learning fuses cognition, emotions and actions (Girod *et al.* 2003:576). Experiences of wonder and beauty can be gained not only from art, but also in interpreting a poem, in solving a mathematics problem, participating in or watching sports, or in a physics experiment. The teacher's role is therefore to 'shape curricular ideas and experiences for children in artistically pleasing and aesthetic ways' (Girod *et al.* 2003:579). These experiences are made possible by combining pedagogic content knowledge with passion and imagination to make the learning experience aesthetic.

Data analysis from the narrative inquiry

As part of the narrative inquiry, data were generated using three clusters of questions which were predominantly open-

ended. The compilation of these questions was informed by the literature that was reviewed, as well as the critical questions that the article set out to address. Thereafter, comparisons and rigorous discussions followed, especially in cases where there were different interpretations of what the data were revealing. In the discussion that follows, we reflect on the key similarities and/or tensions that emerged during the implementation of aesthetics in SS and EMS.

Results

The researchers asked each other three clusters of questions. The first cluster related to 'getting into and on' in SS and EMS. The second cluster focused on 'doing' and the third cluster focused on the broader culture of SS and EMS.

Cluster 1: Questions about 'getting into and on' in SS and EMS

'Getting into and on' refers to whether the lecturers actually incorporate aesthetics into SS and EMS. Both participants indicated that they did incorporate aesthetics into their respective modules. The second inquiry focused on what prompted the lecturer to incorporate aesthetics into their field. With regard to the EMS participant, it was because an appreciation for art, music and dance had been inculcated in her from early childhood. Aesthetic expression was fostered and encouraged by the participant's immediate family circle. This thread of aesthetic expression is used in the participant's lessons as a medium to enhance understanding of concepts, as students tend to identify easily with these forms of learning opportunities. This links to Dewey's (1934) observations of the ability to connect past experiences to enhance the present through imagination.

The SS participant was exposed to a very conservative upbringing, whereby free expression of dance and music was not encouraged and was deemed as inappropriate behaviour for a girl. Her creative energies were only nurtured when she pursued teaching as a career. The joy and excitement experienced by students' participation in the lesson opened up the aesthetic dimension in this participant. Many concepts taught in Geography are very abstract, making it extremely difficult for students to understand. It becomes important to think and teach creatively using aesthetic forms of expression, more specifically art (Girod *et al.* 2003:579). Therefore, as content knowledge continues to grow, so too does the creative energies (David 2005:60). This is supported by Bourdieu's (1984:3) spontaneous theory of art perception, which is 'founded on the experience of familiarity and immediate comprehension'. Music and dance was, however, not integrated into lessons, nor were students encouraged to incorporate this dimension into their presentations.

Cluster 2: Questions focusing on 'doing'

'Doing' pertains to the form of aesthetics incorporated and adopted into SS and EMS. The SS participant incorporates into her teaching the visual – using posters, models, pictures and videos – and the verbal – mainly in the form

of discussions. Class discussions promote students' personal views and, at the same time, develop mutual respect amongst students. These forms of interactions stimulate thinking, challenge attitudes and beliefs, and develop interpersonal skills (Burbules & Bruce 2001), thereby allowing students to challenge inequalities and power relations that exist in society. The aesthetic dimension is experienced when students' expression of learning takes on the 'wow' effect. Plate tectonics is a very abstract topic which can lead to a lack of understanding and a lack of interest in the topic. The use of videos combined with a class discussion can contribute to a greater understanding of the topic. This results in students' heightened appreciation of nature, which, for the participant, is an example of an aesthetic experience. This familiarity with the content and immediate understanding that is emerging as a result of students' experiences of aesthetics is also evident (Bourdieu 1984:3). This is similar to Gaudelli and Hewitt's (2010:83) views on a discussion or debate having the potential to be experienced as aesthetic.

The EMS participant uses the gallery walk, dance, art and music. Teaching the topic 'forms of ownership' to first-year students can be very boring. Students are therefore given aspects of the topic to present to the class, using dance and music as an accompaniment. Students are also encouraged to use PowerPoint™ presentations. The gallery walk is another form of aesthetic expression used in first-year, second-year and third-year modules. Students are given a topic for which they are required to prepare a collage, individually or in groups. The collage is then displayed in the lecture rooms. Students, individually or in groups, move from collage to collage and analyse each in accordance to the PMI principles. The 'P' represents the positives, the 'M' represents the negatives (minus), although the participant prefers to use 'improvements' and the 'I' refers to innovativeness. Silence must be maintained to provide students with a similar atmosphere to that of a gallery, which will enable students to assimilate internally the different aspects of the collage. These aesthetic experiences point clearly to a fusion of cognition, emotions and actions (Girod *et al.* 2003:576). The use of the PMI principles in the gallery walk 'may disclose significations at different levels' (Bourdieu 1984:4), thereby promoting a heightened critical understanding (Uys & Gwele 2005:11).

Cluster 3: Questions on the broader culture of SS and EMS

The third form of inquiry was concerned with the culture that exists in SS and EMS. This draws on the philosophy of critical social theory, as expounded by Uys and Gwele (2005) and supported further by Beatty *et al.* (2009). These authors argue that teachers who follow this philosophy are advocates of deconstruction exercises that allow for students to be critically engaged. In this regard, it is similar to making use of an aesthetic approach.

The small numbers in the SS group allows for various informal discussions to take place between the participant and students. From these interactions, it was possible to conclude that the majority of students were from the middle

to lower income groups. When engaging in class discussions and debates about the environment, the participant discovered that students from the middle to upper income groups were more aesthetically inclined. This is qualified by Bourdieu (1984:3), who claims that 'educated people are at home with scholarly culture'. The participant described aesthetic appreciation as environmental awareness and appreciation. Students from the lower income groups tend to display limited appreciation for the environment as the satisfaction of their immediate needs of food and shelter is the priority.

The EMS participant engages in a SWOT analysis of each student at the beginning of the year, the aim of which is to determine students' lifestyles. The acronym 'SWOT' refers to strengths, weaknesses, opportunities and threats. According to the participant's analysis, the majority of first-year and second-year students are financially stable. The third-years have a large number of students who are making use of financial aid. The participant has found that Black students prefer music and dance as a form of aesthetic expression in their lessons. This is in keeping with Goldman (2010:5), who argued that there is a positive correlation between cognition and social construction. These students tend to be relaxed, comfortable and confident when using music and dance to express their understanding of the content knowledge, whilst White students favoured class discussions as a form of aesthetic expression.

The findings in our final analysis indicated that whilst both participants belong to the same race, they were exposed to very different socialisation processes pertaining to aesthetics. These early exposures to aesthetics in the form of art, music and dance had influenced the manner in which both these participants incorporated these aspects into their lessons. Ganger (2006:64) found that our language, thoughts and actions are embedded in our cultural inheritance. The EMS participant was encouraged to use dance and music to express herself through movement. It is these very forms of aesthetic expression that are also used to enhance her lessons. On the other hand, dance and music did not feature in the SS participant's lifestyle and were found to not be used as an aesthetic tool in her lessons. The SS participant preferred to use artistic tools such as pictures, posters and videos. Discussion was used as a teaching strategy to enhance the aesthetic dimension of the lesson. Although the SS participant was not exposed to aesthetic forms of expression from an early age, the participant was still able to incorporate this dimension successfully into the modules. Culture did not have a significant impact on this participant's ability to embrace aesthetics. Instead, the aesthetic dimension was nurtured as content knowledge was strengthened.

Recommendations

The authors recommend that for effective teaching of EMS and SS content to take place, practitioners need to take full account of the multidimensional cultural world of the student

and therefore adopt a multidimensional approach which is inclusive of aesthetics. Practical applications can include song, dance and art when teaching content pertaining to forms of ownership and purchasing management, to mention but a few applications in EMS. The outcomes of this study emphasise the need for teachers to reflect continuously on their practice and on their role in allowing students to become transformers of society through the use of teaching strategies that will facilitate aesthetic understanding and experiences of the content taught. The challenge lies in inculcating and sustaining the creative energies within teachers so as to prevent them from slipping back into their routine and sometimes monotonous ways of teaching. The outcomes also emphasise the need for teachers to be lifelong students, so as to engage continuously with the latest pedagogy and content in their fields.

Conclusion

How people, and in particular students, see the world is of interest to practitioners within Social Science education. Some may dispute our assertion that an aesthetic worldview is a major contributor to how students will view the world around them. Using aesthetics means coming to understand a different view of the world (though it does not necessarily mean adopting a different worldview). In this article, we argued that 'worldview is the sum of whatever number of cultural components (e.g. religion, aesthetics, ideology), including language we embrace' (Cobern 1994).

Acknowledgements

Competing interests

The authors declare that they have no financial or personal relationships which may have inappropriately influenced them in writing this article.

Authors' contributions

J.R (University of KwaZulu-Natal) and S.R. (University of Johannesburg) contributed equally to the research and writing of this article.

References

- Adams, M., 2000, 'Readings for diversity and social justice: A general introduction', in M. Adams, W.J. Blumenfield, R. Castaneda, R. Hackman, H.W. Peters & M.L. Zuniga (eds.), *Readings for diversity and social justice: An anthology of racism, antisemitism, sexism, heterosexism, and classism*, pp. 5–9, Routledge, New York.
- Beatty, J.E., Leigh, J.S.A. & Dean, K.L., 2009, 'Philosophy rediscovered: Exploring the connections between teaching philosophies, educational philosophies, and philosophy', *Journal of Management Education* 33, 99–114.
- Bourdieu, P., 1984, 'Outline of a sociological theory of art perception', in P. Bourdieu & R. Johnson (eds.), *The field of cultural production: Essays on art and literature*, pp.1–27, Columbia University Press, New York.
- Burbules, N. & Bruce, B., 2001, 'Theory and research on teaching as dialogue', in V. Richardson (ed.), *Handbook on research on teaching*, 4th edn., pp. 1102–1121, America Educational Research Association, Washington, DC.
- Carlson, A., 2003, *Teaching environmental aesthetics*, viewed 01 April 2011, from http://www.aesthetics-online.org/articles/index.php?articles_id=17
- Cobern, W.W., 1994, *Worldview theory and conceptual change in science education*, viewed 01 April 2011, from <http://94.23.146.173/ficheros/dbdb11ad10e2ac9b28043c86bfd182219.pdf>
- Cote, J.E., 1996, 'Sociological perspectives on identity formation: The culture-identity link and identity capital', *Journal of Adolescence* 19, 417–428.

- David, H., 2005, 'Creativity in teaching and building a meaningful life as a teacher', *The Journal of Aesthetic Education* 39(2), 57–68.
- Department of Education, 2007, 'National education policy framework for teacher education and development in South Africa', *Government Gazette* 502(29832), Department of Education, Pretoria.
- Dewey, J., 1934, *Art as experience*, Penguin Putnam Inc., New York.
- Ganger, D.A., 2006, 'Teaching aesthetics and aesthetic teaching: Toward a Deweyan perspective', *Journal of Aesthetic Education* 40(2), 45–66. 1
- Gaudelli, W. & Hewitt, R., 2010, 'The aesthetic potential of global issues curriculum', *The Journal of Aesthetics Education* 44(2), 83–99.
- Girod, M., Rau, C. & Schepige, A., 2003, 'Appreciating the beauty of science ideas: Teaching for aesthetic understanding', *Science Education* 87(4), 574–587.
- Goldman, K.L., 2010, 'Maxine Greene: Influence on the life and work of a dynamic educator', *Journal of Educational Controversy*, viewed 25 February 2011, from <http://www.wce.wvu.edu/resources/CEP/eJournal/v005n001/a019.shtml>
- Gravett, S. & De Beer, J., 2010, 'The teacher as a reflective practitioner', in G. Hewett (ed.), *Becoming a teacher*, pp. 1–15, Pearson Education, Cape Town.
- Kramp, M.K., 2004, 'Exploring life and experience through narrative inquiry', in K. deMarrais & S.D. Lapan (eds.), *Foundations for research: Methods of inquiry in education and the social sciences*, pp. 103–122. Lawrence Erlbaum, Mahwah.
- Lubig, J. & VanAbel, T., 2010, *Field experiences and student teaching handbook*, viewed 24 February 2011, from <http://www.nmu.edu/education/node/164>
- Olson, M.R., 1995, 'Conceptualizing narrative authority: Implications for teacher education', *Teaching & Teacher Education* 11(2), 119–135.
- Palmer, J. & Neal, P., 1994, *The handbook of environmental education*, Routledge, London.
- Salah, A.A.A. & Salah A.A., 2008, 'Technoscience art: A bridge between neuroaesthetics and art history?', *Review of General Psychology* 12(2), 147–158.
- Uys, L.R. & Gwele, N.S., 2005, *Curriculum development in nursing: Process and innovations*, Routledge, Abingdon.