Reflections on the SIKSP: Voices of the participants

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Abstract
The Science and Indigenous Knowledge Systems Project (SIKSP), located at an African university, has since its inception in 2004 been training pre-service and practising teachers on how to implement an inclusive indigenous knowledge (IK) curriculum which calls on teachers to integrate IK with science in their classrooms. This article, based on interviews, presents some of the participants’ reflections, voices, sentiments and feelings about the SIKSP. The findings showed that the project helped to raise the participants’ awareness about IK, and its relevance to contemporary life. The findings foresaw some of the challenges involved in the implementation of the new science curriculum in terms of: the multiple representations of IK; the potential conflict that might arise at the intersection of science and IK; the complexity of a multicultural classroom; teachers’ willingness and/or ability to adopt a new role in the classroom other than the status quo; and the paucity of instructional strategies compatible with the goals of the new science curriculum. Regardless of all these factors, participants felt emancipated to teach IK and they expressed the need for administrative support and follow-up workshops. They also suggested that in order to make a difference in the country the project should be expanded to other schools and provinces.

Keywords: Indigenous knowledge system; professional development; participants’ reflection; science education

INTRODUCTION
The end of colonialism and the apartheid system has brought about transformations in the system of education in many countries. One of the transformations has been in terms of the language of instruction as many countries that used to have only the language of the coloniser as the medium of instruction have moved in the direction to include local languages too. The experience has proven that the issue is of high complexity and a plethora of studies have taken place looking for effective and positive ways to accommodate this innovation (e.g. Brock-Utne 2006; Chimbutane 2004). Another transformation has been in the content itself. Knowledge, such as
local medicinal plants; local ways of protecting the environment; local truths about
the earth and the moon; and local ways of producing food, are being included in
the new science curriculum. The inclusion of such knowledge implies, however,
the creation of new pedagogies and philosophies to teach and to learn. It implies
also new set of axiological perspectives. In fact most local knowledge was regarded
as superstitious and non-official, thus this designation carried many preconceptions
and disrespect that built a hostile environment for this knowledge. Ideologically,
a huge transformation is demanded in order to address the new pedagogies and
philosophies of local schools. This ideology implies a more hybrid approach to deal
with knowledge, an approach that would acknowledge the co-existence in people’s
minds and culture of two or more systems of knowledge. Theories, such as boundary
crossing (e.g. Ogbu 1992); border crossing (Aikenhead 2000); collateral learning
(e.g. Jegede 1999); and Contiguity Argumentation Theory (Ogunniyi 1995), entail a
more dialectic standpoint in contrast to the past theories that had in common the fact
that they ignored all other ways of seeing and interpreting the world.

THE SCIENCE AND INDIGENOUS SYSTEMS PROJECT

The Science and Indigenous Knowledge System Project (SIKSP) is based at the
School of Science and Mathematics Education at the University of Western Cape,
Cape Town, South Africa. The aim of the project is to support teachers and pre-
service teachers and help them to understand, to conceive and to enact the goals of
the new science curriculum in South Africa regarding science and the inclusion of an
Indigenous Knowledge System (IKS).

The methodology of the project consists of a series of workshops and plenary
sessions as part of the programme for postgraduate degrees and for bachelor’s and
honours degrees in science and mathematics education. Most of the students are
high school teachers, some are either primary school teachers or principals, and a
few others have no experience in teaching yet. The workshops and plenary sessions
have thus far included speakers from other countries, for example researchers and
educators from Japan, the United States (US), Mozambique, Zimbabwe, Swaziland,
Ghana and Botswana. The topics in these sessions deal with the Nature of IKS
(NOIKS) and the Nature of Science (NOS), experiences of including IKS worldwide
and material development. Pre- and post-tests are employed in a quasi experimental
study model, to evaluate the impact of the workshops on the students. Several papers
have been produced (e.g. Mushayikwa and Ogunniyi 2011; Nhalevilo and Ogunniyi
2011; Ogunniyi and Hewson 2008; Ramorogo and Ogunniyi 2010) exposing some
of the outcomes.

This article does not aim to evaluate the impact of the project on participants’
knowledge; instead it seeks to understand the feelings of the participants. Thus, rather
than using the pre- and post-tests as in most of the articles produced from the project,
we opted for interviews which did not include questions about the participants’
knowledge of the content, but on how participants experienced the project and what
their judgements were in relation to the project. The interviews were conducted with the students, the facilitators and the project leader. However, to keep the word limit acceptable, the article will not present the interview with the project leader.

THE AUTHORS OF THE ARTICLE

According to Adler (2004, 107), ‘in conducting qualitative research, the identity of the authors and his or her subjectivity is of concern for establishing authenticity’. We followed this recommendation, as the methodology used to analyse and interpret the data was qualitative, and furthermore, because the interviews were about the participants’ feelings, a relationship between the participants and the interviewer is relevant to establish authenticity. I, the first author, am currently a science teacher educator in Mozambique and have been working in higher education for the past 15 years. I joined the SIKSP in 2009 as a researcher fellow. My motivation in joining the project was mainly to learn from the experience regarding the inclusion of IK in school science. Cultural issues and specifically IKS have represented one of my interest areas of study. I had before conducted research and written papers focussing on an inclusive education and particularly the integration of IKS in the school curriculum (e.g. Afonso 2007; Nhalevilo 2009). I was delighted with the invitation to join the SIKSP and I thought that it would constitute a step forward in the development of my own culturally inclusive philosophy of science teacher education in Mozambique (Afonso 2007). Guba and Lincoln (1989, 241) state that transferability is dependent on ‘the degree to which salient conditions overlap or match’, thus it should be possible, in the face of the cultural and historical similarities between South Africa and Mozambique. When I decided to interview the participants and record their feelings in respect to the project, I had known all of them for almost two years. We had shared a lot, and I felt I belonged to the group.

The second author, Ogunniyi, is the project leader. He is the author of the theory that guides the philosophy of the SIKSP and has been working in the area of science education and cultural aspects of it in different contexts and worldviews for the last 3–4 decades. His earlier articles on these issues (e.g. Ogunniyi 1986) were already raising the complexity of teaching what is called Western science (W-science) in the African context.

THE TEACHER EDUCATION TERRAIN

Environmental crises, changes in the political systems and new cultural set ups in African countries demand educational reforms and transformations. Critiques of the status quo of education and the role of education fall ultimately into researching for new approaches and programmes in teacher education as eventually actual changes in classrooms rely on teacher practices. For many African countries changes have implied a paradigm shift in curriculum design and implementation. Teacher education and teachers’ professional development have thus become turbulent but
very necessary areas of research.

In a review on the teachers’ professional development field, Borko (2004) refers that there are three phases. Phase 1: the research focus is on an individual professional development programme at a single site. The emphasis is on teachers as learners. The context remains unstudied. Phase 2: researchers study a single professional development programme enacted by more than one facilitator or more than one site. They explore the relationship among facilitators, the professional development programme and teachers as learners. Phase 3: the research focus broadens to compare multiple professional development programmes, each enacted at multiple sites. Borko (2004, 12) states that ‘although each phase builds on the previous one, this does not imply that design and research efforts can, or should, proceed in a linear fashion from phase 1 to phase 3’.

The SIKSP falls in between phase 1 and phase 2 according to Borko’s perspectives in that it is a single development programme, enacted by various facilitators at a single site. It is expected that the project will move to phase 3, expanding the programme to other provinces in South Africa.

**DATA INTERPRETATION FRAMEWORK**

We chose the interpretive and the critical paradigm to make sense of the lived experiences of the participants in the project. As Cohen, Manion and Morrison (2007) state, the interpretive paradigm contests the positivist approach of interpreting the world objectively. The ‘central endeavour is to understand the subjective world of human experience’ (Cohen et al. 2007, 21). However, some critics of the interpretive paradigm argue that it seeks to understand, but has no critical power to make change, its concerns are limited to hermeneutical knowledge (Cohen et al. 2007). This fact justifies our use of the critical paradigm employing thus a multi-paradigmatic framework. According to Taylor (2008, 887): ‘Within a multi-paradigmatic research design space, cultural studies researchers in science and mathematics education are drawing on both interpretive and critical paradigms to create hybrid research methodologies for exploration and intervention aimed at improving social conditions in local contexts.’

For the context of the current article, the critical paradigm is seen as a standpoint to justify and to impel us to go beyond the interpretations, to go further than the hermeneutical process; we strive to make the data a path for our praxis – critical practical actions in the SIKSP. As Afonso (2007, 29) states, ‘praxis involves action and reflection in a relationship where theory, practice and critical thinking are reflexive’. From the critical paradigm standpoint we legitimate the use of analytical reflexivity. According to Macbeth (2001, 36), the notion of analytic reflexivity is marked in general parlance by a ‘turning back upon itself’, for example, the turning back of an inquiry or a theory or a text onto its own formative possibilities. The interpretive and critical analysis should then be seen as a means for improvement, as an enlightenment component for praxis.
We conducted interviews in order to generate data. The words *generate data* are intentionally used as substitutes but not as analogues for *data collection* to denote the subjective nature on both sides (interviewer and interviewee). This posture embraces Miller and Glassner’s (2004, 125) statement in reference to social constructionist theory: ‘interview is obviously and exclusively an interaction between the interview and interview subject in which both participants create and construct narrative versions of the social world’. While we represent our own interpretations from these narratives, we avoid the ‘othering’ discourse (Burdel and Swadener 1999), a discourse in which the individual’s account is understood and written by the ‘other’ and so, we transcribed most of the responses verbatim, acknowledging thus that our interpretations are situated, that is, written from our own perspective. The questions for the interviews were outlined according to the following themes: expectations, challenges, perceptions, achievements and disappointments. These themes constituted a guide for the interviews, though the sequence and working of questions were decided in the course of the interviews (Cohen et al. 2007). For the interpretation of the data we transcribed the interviews verbatim and categorised the information in accordance with the themes initially chosen. The criteria for quality in the methodological procedure were derived from Guba and Lincoln (1989): (i) authenticity: fairness, ontological authenticity, catalytic authenticity, tactic authenticity; (ii) transferability: the degree it may be transferable to other contexts and from Saukko (2005); and (iii) reflexivity: the ‘real implications our research has for the reality we are studying’ (Saukko 2005, 352).

**The interviewers**

The interviewers were one bioinformatics doctoral student (SK), three master’s students in science education (PV, RS, RM), and two honours students (BM and AD). All of them had experience in science teaching except for AD who was a pre-service participant.

**Data interpretation and discussion**

In the following paragraphs we transcribe the participants’ responses to the interviews and present our interpretations of and comments about them.

**Theme 1: What is your role in the SIKSP?**

**PV:** There is not a clear defined role ... but I am one of the students who completed BEd honours and I am busy with Prof. on IKS ... for the MEd course. Because of our knowledge on NOS and NOIKS Prof. required us to be facilitators with other educators.

**RS:** I think initially I was an observer participant and later I registered as a student (...) at the beginning I wanted to see what was cooking...
SK: My role has been to coordinate ... with respect to development of worksheets and the implementation of these worksheets ... the pedagogy and subject content knowledge ... more coordination and producing materials.

These statements indicate the particularity of the SIKSP, where participants, from different backgrounds and schools and holding different degrees, are part of the group which do research and develop materials collaboratively. It implies that for some of the content one participant may be a facilitator, whereas in other instances his/her role will be more of a learner. The inductive nature of reasoning and producing knowledge may also contribute to this view of ‘no clear defined role’. Almost nothing was to be proved; rather, content and methodologies were to be constructed.

But we noted too that participants did not lose their individual identity. They were still BEd students, master’s students, or other, but talking from the group standpoint these identities became subordinate to their role as contributors for the project.

It was also interesting to note that SK said his ‘role has been to coordinate’ but did not refer specifically that he was a coordinator (the question was: What is your role?). This may also denote a sense of unfixed/dynamic roles. Conducting the interviews impacted on my [the first author’s] own reflections about the project. For example, in this case when I realised that the participants had an image of their role as dynamic I turned the question to me: What was my role in the SIKSP? As others I perceived that my role was of an observer participant (at the beginning when I joined the project), but later a facilitator, research fellow, tutor, and learner. As PV remarked: There is not a clear[ly] defined role.

What were your expectations at the beginning?

RM: In the beginning I was not quite sure what the project was about. Specially IKS ... the IKS component ...

RS: I just wanted to know what was cooking in there ... because I was introduced to the project by my successor in my job ... she brought me here ... and then later on I registered as a Master student because it seemed to be a solution to getting the Master which I have been trying to do for twenty years ... for me I was hoping to find focus on my research.

BM: Initially when I came for an assignment the lecturer invited. My expectations were to know what IKS is. Then I wanted to come more and more ...

AD: I was willing to learn. At the beginning I found very interesting, but I did not know about IKS.
SK: I entered by accident. I was not in the project ... It was my interest ... my curiosity on what it is this thing called IKS and how could we be able to integrate IKS and science. So being a scientist and also a teacher it was more of curiosity.

Wilson and Berne (1999) note that one of the challenges in professional development involves bridging the gap between teachers’ expectations and the expectations or goals of the programme itself. In general the dominant idea from the participants in regard to their expectations was to get to know about IKS, which seems more about a sense of curiosity than a desire to master and become active agents in its implementation.

A gap that might have existed in this context was the participants’ expectations from the project goals – to form facilitators that could go back to their schools and implement lessons based on Contiguity Argumentation Theory (Ogunniyi 1995). As referred earlier, the primary aim of the project was to prepare teachers to implement the new science curriculum demand in relation to IKS. The project also aimed to transform these pioneer teachers into facilitators who could conduct similar series or workshops in other schools and provinces. Did this gap narrow in the course of the project? We will find out subsequently in the course of the article.

What was the most difficult part of the project?

RM: I can remember when we had to work on the whole idea of IKS ... and even when they came to videotape us ... I told him that that was something that needed to be demonstrated ... the argumentation theory.

RS: I had not done any of the coursework that the students had done ... it was like picking up stompers [sic] ... another difficult thing was the literature ...

BM: To be honest when I came my eyes were opened but not opened much to the level I was ... the part that was difficult was the main purpose of me being part of the project ...

AD: The literature at the beginning was very difficult. I did not understand most of the literature ... Also the material development was a bit trick at the beginning ... TAP was difficult ... all the terminology ... I was very confused at the beginning.

SK: I call myself a hard core scientist who have been involved in empirical research where you need data for quantitative verification analysis. How do you merge science based on deductive and IKS which are based on metaphysical concepts ... how you do merge the two was the most challenge.
For most of the interviewed participants the most difficult part of the project was to understand the whole idea at the beginning and to grasp the literature. This seems to illustrate their level of knowledge about IKS as we can see from the previous item that most of them ‘wanted to understand what IKS was all about’. They entered the project without any background knowledge about IKS and related literature especially in regard the Contiguity Argumentation Theory and some of them entered the project without an agenda for it. They just wanted to accomplish specific tasks, for example, to complete their master’s degree or an assignment.

**Looking back, what would you say you learned from the project?**

**PV:** I think I have learned a lot. Certainly my knowledge just on Dialogical Argumentation has been expanded. I have learned so much more on IKS ... I have learned ... come to realise that what we study today what we call W-science is nothing but a body ... my knowledge based on IKS has been expanded ... it certainly probed me to read more on what is IKS ... it made me to start to look at IKS even in the area I come from. The project has certainly encouraged me to do greater studies and gaining more knowledge.

**RM:** It is a way we were trained ... outline ... but the new way requires a lot of creativity...

**BM:** I learned the role of IKS in our daily life, I learn the role of IKS at home, as a person individually. Because the modern science has taken prominence in terms of assisting health ... but the reality is the indigenous medication also helps. It opened my eyes, because my mother is a traditional healer and I was not looking at that ... as a natural ... I use to look as witchcraft type of these things or too much of culture ... I have learned even to integrate it in my teaching at school.

**AD:** Such a lot ... I have a bit of understanding of IKS and a bit of understanding of the nature of science that I can incorporate in my teaching practice. I became a better developer of materials. I can now use what I learned from the project.

**SK:** Being a scientist I integrate IKS into my day to day science revolutionised my approach to scientific thinking. In fact I have gone to a paradigm shift in terms of my day to day scientific analyses ... I can say to the respect to paradigm shift ... previously I have done much analyses in terms of one-dimensional way ... Now even if I am doing bioinformatics research, I look to where they have integrated traditional medicine ... for me it has helped me significantly ... I come out with a new conceptual theory.
At an axiological level, it seems that the project helped to raise participants’ awareness about the existence and place of IKS in their daily lives. It also seems that it contributed to a shift in their understanding and pedagogical practice (e.g. RM move from an outline kind of pedagogy to a creative mode of teaching). It also contributed to raising their critical thinking and analysis in regard to IKS (e.g. SK). Relating participant’s responses to this item with their responses to the item concerning expectation, we are inclined to believe that during the project their expectations and that of the project were narrowed.

What are your perceptions about other participants?

**PV:** We develop some good bonds ... we ... because to have Prof. we became ... very much ... very supportive group. There was a young lady who dropped out but those of us who were left did develop a bond among us that came stronger ... yes we become a very supportive group. We also had staff who came in on the project and I think ... many of this stuff were new for them, they were not prepared ... there were some people who came for a couple of weeks and they made clear that ... I am not interested because right now I don’t have to teach it at my school ... which was a very negative attitude [...] it was sad to see other colleagues dropped by the way ... we tried to contact ... I’ve seen some of the chaps I contacted but they said: “No, I don’t have time.”

**RM:** Worries me that the group did not stay fixed ... people are there and then ... this destabilize the group. That needs to be addressed ... It is a matter of commitment.

**AD:** Honestly at the beginning I felt like a baby, because everybody had done their honours before and were master’s students ... they took me on the paces and very enthusiastic.

**BM:** They helped the project to grow ... there is a lot we shared ... it is not only about IKS.

**SK:** They were enthusiastic much more in science/IKS which was more experiment based, but theoretically the enthusiasm was not there ... that is what I see...

In general the group regarded their colleagues as having a positive impact. However, dropouts had a negative impact. In this context is hard to address the issue of dropouts as probably each member had his/her own reasons, however we can infer that support from the schools where they are working should have a positive effect. Taking into consideration, for example, the teacher who said that he does not need to
teach, we believe that if he had motivation from his school or if the school had shown interest on his professional development, he would most likely not have given up.

**If you could restart today, what would you do differently?**

**PV:** We did not have enough experience on Argumentation ... for a project like this you have to make sure where your students ... their level are. It is difficult to say let’s do it differently because it would imply different circumstances.

**RM:** I think to familiarise yourself with the all notion of IKS ... was busy with other modules.

**RS:** ... to go to library and learn to access the material online. This should be told to all students at the beginning ... also you must read and write, read and write not just read.

**BM:** What I should have done ... my weakness I don’t put my thoughts in black and white. I don’t write down my ideas.

**AD:** What I would do differently is to ask more questions because at the beginning I stood back. I feel that I miss a lot because I did not ask questions ... That is something I have learned. Now I am more active.

Interviews must be beneficial to both parts (interviewer and interviewed). This item offered an instance where participants could reflect back. Hopefully their responses on this item helped them for future practices.

**Anything to add?**

**PV:** I would love to see SIKSP to go strength and the department of education to tell teachers to get involved with this project. I would love to see many more educators involved. It is not that easy in times ... some are very subservience like those who don’t talk ... that is a challenge how can you not break down the culture barriers but get the learners to understand that they will benefit and they are not moving out of their realm of religious beliefs.

**BM:** My expectations were met ... though I would ... for me ... I want to see the practical part, the actions happening ... so that we take what we are learning here back to our classroom and our colleagues. Because it is sad when you go around and you ask teachers and they don’t know anything.
**SK:** Challenges in designing materials. How do you design IKS science curriculum material in a way like one size fits all... like receipts? The one size fits all do not work. Some students are Hindus, other Muslims, other Christians, Atheist... some cannot touch alcohol so how do you implement taking into consideration all this different beliefs, religion, culture? If we are going to design curriculum materials that are sensitive to all cultures, my suggestion is that in respect to South Africa one size fits all may not work... the Zulus may say this insults my culture and the Muslim may say to another topic it is against my culture.

**REFLECTIONS**

Gilley and Kerno (2010) refer to three stages of group formation: the first stage is of a group; the second is of a team; and the third is of a community of practice (CoP). Table 1 describes the characteristics of each phase.

Table 1. Stages of group formation

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>Team</th>
<th>Community of practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td>Small</td>
<td>Small to moderate</td>
<td>A few to hundreds. As population increases, so does likelihood of subdivision of members into relevant areas of interest or inquiry.</td>
</tr>
<tr>
<td><strong>Longevity</strong></td>
<td>Specific ending</td>
<td>Ongoing... members may change</td>
<td>A few years to several centuries</td>
</tr>
<tr>
<td><strong>Member interaction / Structure</strong></td>
<td>Assigned, formal or informal, regular</td>
<td>Formal or informal, sporadic to regular</td>
<td>Informal, spontaneous, organic. No perfunctory statements, creation of ‘shortcuts’ to increase efficiency. Common consensus of ‘who’s who,’ no formal roster</td>
</tr>
<tr>
<td><strong>Accountability / responsibility</strong></td>
<td>Individual</td>
<td>Shared</td>
<td>None – Members are not formally recognized as such, so may come and go as desired</td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
<td>Specific task / objectives</td>
<td>Solutions, problem solving, creativity, innovation</td>
<td>Create and exchange ideas, expand and share knowledge. Common passion and commitment to developing skills and proficiencies</td>
</tr>
<tr>
<td><strong>Members</strong></td>
<td>Assigned, high individual talent</td>
<td>Voluntary, complementary talent</td>
<td>Self-selection</td>
</tr>
<tr>
<td><strong>Commitment by members</strong></td>
<td>Low – medium</td>
<td>Medium – high</td>
<td>High, can be very loyal to both group purpose and members</td>
</tr>
<tr>
<td><strong>Authority / power</strong></td>
<td>Bestowed by the organization</td>
<td>Bestowed by the organization</td>
<td>None, at least formally acknowledged</td>
</tr>
</tbody>
</table>

Source: Gilley and Kerno Jr. 2010
It is our view that when joining the SIKSP participants were already on stage 1 (most of them joined the project under a specific task, e.g. to complete an assignment, to gain focus for the research, to complete a master’s thesis). As we see from their responses most of them were confused at the beginning and some were too timid to speak or ask questions assuming that the other members ‘knew more’. It is natural that at the beginning, when members of the group do not know each other, they may feel unconfident, but the implication for us, is that attention must be paid at the beginning to ensure confidence in all the members. The question of how to effectively manage a group with members from different backgrounds and experience has to be addressed. In spite of this, their statements led us to believe that a team was formed. The characteristics of the project (workshops, unfixed roles) may have been the motor to transform the group into a team. We foresee that the challenge will be to create a CoP, and this should be the ultimate aim of the SIKSP. This is in agreement with the final expectations of the participants: to see more practical actions; and to expand to other teachers and schools; and the expectations of the project: to prepare teachers at a national level.

The other challenge which already rose during the workshops is: how to be ethically right to different cultural or religious groups? The revised national curriculum statement published by the Department of Education (DOE 2002) states that students must appreciate different worldviews, that they must learn ‘about the rich diversity of cultures, beliefs and world views within which the unity of South Africa is manifested’ (DOE 2002, 11) it states further that learners must be ‘culturally and aesthetically sensitive across a range of social contexts’ (DOE 2002, 15); however, some participants complained that their cultural and religious beliefs were harmed when implementing such an inclusive perspective. For instance, during one practical exercise in a lesson aimed at integrating IKS in science, the facilitator was explaining the production of Umqombothi (South African traditional beer) as an example of fermentation. Two students, from different religions, alleged that to observe and to witness real examples of alcohol production was against their religion. Henderson and Kesson (2004, 54) refer that it is important to acknowledge that ‘in a pluralistic society no one cultural element is the norm, and every perspective must be considered important and treated with honour and respect’. They argue, however, that while this consideration for each person’s cultural perspective is important, it brings challenges and limitations when it comes to a shared vision of what is good or a shared sense of principles and values.

The question of what is ethically good may encompass issues of relativism, which as has been pointed out (e.g. Kawada 2001), may bear a negative side shielding the burden of essentialism and isolationism. The question of how far we can accept others’ views in science education could lead us to recur to the notion of phronesis, as it involves moral choices. Phronesis is about making wise judgments (Henderson and Kesson 2004) and since there is no prescription about when a judgment is wise, teachers will instead have to recur to their experience and to their tacit knowledge. Teachers’ own experience may not be underestimated in this regard.
**IMPLICATIONS AND CONCLUSION**

The results from the interviews suggest that stability of the group is an important factor for productivity and connectedness of the participants. This implies that strategies to keep participants motivated and to raise their level of commitment should be sought. Perhaps time and space should be found to allow participants each to narrate their experience and to share their fears and reservations. One way could possibly be to integrate personal narratives where participants could write confessional tales (Van Maanen 1988) about their feelings in relation to the group and their expectations and challenges. This could perhaps help also in relation to their expectations. Participants should share their expectations to ensure that the gap between the project’s goals and their expectations is narrowed. These confessional narratives could thus be part of personal journals/diaries, as some of the participants regretted not having written down their ideas and notes from the beginning. The use of personal journals has been used to enhance individuals’ growth. As we referred above, one of the challenges is to move the team to a CoP, and these practices may support this move. Personal journals then should make part of the participants’ portfolios.

The results also suggested that differences in cultural and religious beliefs may constitute challenges to integrating IKS in South African schools. Although the new science curriculum states that students must appreciate different cultures and worldviews that make South Africa a united country, ethical dilemmas may arise and teachers have to find strategies to deal with them accordingly in the context. There is no one size fits all solution; thus, teachers will have to make practical judgements – *phronesis*.

Finally we can also infer from the interviews that associations with schools and the Department of education and other sectors in education may play a vital role. On the one hand this would motivate teachers to remain in the project and on the other hand it would be the catalyst to transform the team into a community of practice (CoP).

**REFERENCES**


