

Investigating factors that impact the success of students in a Higher Education classroom: a case study

Eunice Nyamupangedengu

(Received 27 August 2016; accepted 17 May 2017)

Abstract

South African Higher Education Institutions (SAHEIs) were rocked by student protests in 2015 and 2016. While the main issue that sparked the protests was unaffordable fee hikes which were negatively impacting equitable access to HE, the protests also brought to the fore, other issues impacting students' success such as lack of transformation and the manner in which universities deliver their curricula which does not cater for the now diverse student body. The main educational challenge is not the diversity of the student body but rather the failure by institutions and individuals to tailor the standard teaching and learning processes to the realities of the great majority of the current student body. This was the motivation for this study in which I sought to investigate factors that impact students' success in my classroom. Data was collected from students in the form of students' responses to an open-ended question at the beginning of a course and to semi-structured group interviews at the end of the course. Students' responses were analysed using various bodies of literature as a lens. The factors that are likely to impact the success of the diverse student body in a Higher Education classroom were identified and discussed and recommendations were made.

Introduction

South African Higher Education Institutions (SAHEIs) were rocked by student protests in 2015 and 2016. While the main issue that sparked the protests was unaffordable fee hikes which were negatively impacting equitable access to HE, the protests also brought to the fore, a host of other issues impacting students' success at HEIs such as lack of transformation, curriculum relevance and the manner in which universities deliver their curricula. Historically, South African higher education used to target and to serve a minority ethnic group (Mdepa & Tshiwula, 2012). However, with the dawn of democracy in 1994, the student body at HEIs has been changing and

is continuously changing in terms of numbers, race, and socio-economic, cultural and academic backgrounds (Scott, Yeld, & Hendry, 2007). Despite these changes that have taken place in the student intake, traditional educational approaches such as the curriculum frameworks, course design methods and content, lecture delivery practices and even time tabling of lectures that were suitable for the then ethnic minority groups continue to prevail in the present diverse South African higher education arena (Scott *et al.*, 2007). This state of affairs has led to some students being privileged while others are disadvantaged. As highlighted by Scott *et al.* (2007), the main educational challenge in these circumstances is not the diversity of the student body but rather the failure by institutions and individuals to tailor the standard teaching and learning processes to the realities of the great majority of the current student body. If institutions and lecturers can consider student diversity in their mainstream teaching and learning approaches, this is likely to enable many students to realise their potential. However, as indicated in the CHE report of 2009 and in Scott *et al.* (2007), the academic staff body at SAHEIs is poorly prepared to deal with the many reasons for the unsatisfactory student outcomes. After reflecting on the issues that students had raised during the protests, I realised that I was one of those members of the academic staff who was not only pedagogically underprepared for teaching the current diversity of students in my courses but also lacked an understanding of the issues of both access and success. When one considers how critical these issues of access and success are in higher education in South Africa, one cannot overemphasise the importance of research that would allow for a better understanding of the issues. This was the motivation for this study in which I sought to understand the issues that impact epistemological access at the level of my classroom.

Literature review and conceptual framework for the study

The concept of epistemological access was used as the framework for the study that is reported in this paper. The term epistemological access (EA) was coined by Morrow during an address at the then University of the North (now University of Limpopo) in 1992. The address was later published in a book called *Learning to teach in South Africa* in 2007. In his 1992 address Morrow described two dimensions of access namely formal access and EA. The latter is the dimension of access which was used as the conceptual framework in

this study and for the purposes of this paper, Morrow's 2007 definition of EA was adapted.

Morrow (2007, p.18) defined EA as "access to the knowledge that universities distribute". It (epistemological access) includes the use of teaching and learning strategies that would enable students even those poorly prepared by schools for university study to learn what is taught at universities and succeed. Morrow's definition seem to be suggesting that the lecturers are the ones that are responsible for enabling EA with the student as the passive recipient. However, in his 1994 paper titled 'Entitlement and achievement in education', he clearly articulated that EA cannot be supplied or transmitted, meaning that agency of the learner is necessary. That being the case, I am of the idea that while lecturers must teach in a way that enable access, the students must also actively participate in the academic practices in order for them to gain that access. Therefore, both the lecturers and the students are key players in enabling EA.

Contexts differ from one institution to another and from one classroom to another and so do students' learning needs. Therefore, pedagogical practices are not a one size fits all i.e. the pedagogical practices that may be suitable and effective in one context may not be effective in a different context, and the kind of support that students require in order to gain EA also vary depending on the contextual situation. Therefore, while issues that impact EA are known, the manifestations of these issues differ from one academic institution to another and from one learning context to another. That being the case, it is important that lecturers should study their classroom contexts so as to be in a position to effectively support their students' EA. In addition, when one considers what is in the pedagogical content knowledge literature e.g. Rollnick, Bennett, Rhemtula, Dharsey, & Ndlovu (2008), effective teaching strategies emanate from a knowledge base for teaching that includes knowledge of students. This means that knowledge of one's students is a pre-requisite if lecturers are to choose teaching strategies that would enable epistemological access. Knowledge of students mean among other things, being aware of their level of competencies and the kind of support that they will need in order to gain EA. This was the motivation for this study, to initiate a social dialogue that would enable me to understand the students in my course in terms of what they considered would enable them to learn.

Context of the study

I am a teacher educator at a SAHEI. I am responsible for teaching genetics a content course to pre-service teachers (PSTs). My institution, which in this paper I refer to as SAX is the setting for this study. SAX offers both undergraduate and postgraduate degrees in Education. In its undergraduate programmes the institution follows a concurrent model of teacher education whereby undergraduate PSTs study both the content subjects and how to teach those subjects in the same school then qualify as teachers for those subjects at the end of their studies. At SAX therefore, teacher educators are responsible for teaching both content and methodology courses to PSTs. The focus of this study was the teaching of a content course, genetics to PSTs who were training to be high school life sciences teachers. The genetics course is a Life Sciences course which is offered to fourth year students who are taking Life Sciences as their major. The teaching of the course takes six weeks.

The student population in my classes represented diversity in all its many forms: race, class, culture and academic background. Observations from some of my previous teaching activities showed that students have different levels of content knowledge and in some cases culture and language hinder meaningful learning of genetics concepts. Therefore, the issues that were raised by students such as the manner in which universities deliver their curricula which is seen to privilege some students and disadvantage others motivated me to carry out this study. My belief is that while universities don't have to necessarily change the content of their curricula as the reputable standards have to be maintained, lecturers who are tasked with the responsibilities of delivering the curricula to students can adjust their teaching practices in order to cater for the diverse student body at HEIs. This necessary shift in teaching practices calls for lecturers, through research, to continuously seek to develop the knowledge that is appropriate for effectively transforming the syllabus and for teaching the complex and diverse student body. Dialogue with students is one way of gaining information that can inform one's teaching. The aim of this study was therefore to investigate the factors that impact EA and success of students in a HE classroom through social dialogue with the students. The research question that guided this study was:

What factors within a Higher Education classroom impact epistemological access and success of a diverse student body?

Research design

Participants

The participants were the 70 students who were registered for the genetics course. All 70 students were invited to be participants and they all gave their consent.

Data sources

There were two main data sources for this study. The first data source was the open ended question that I asked students to respond to at the beginning of the course. The question was: *What do you expect from me as your lecturer for the genetics course?* The question appears to be simplistic but by asking the students to respond to this question, my aim was to initiate a dialogue between me and the students that could bring to light what they view as teaching practices that would enable them to learn. Insights from students' responses were going to inform my teaching of the genetics course. In addition, empathy and care are key to transformative pedagogy and those aspects can only develop through social interactions including social dialogue (Ellery, 2016). The second data source was the interviews with students at the end of the course to find out their experiences of the genetics course. My hope was to glean from students' experiences what could increase or hinder epistemological access and success from what I had implemented in the course.

Data collection

On the first day of the genetics course, students were given plain sheets of paper with the question 'What do you expect from me as your lecturer for the genetics course?' printed on them. I then explained to the students that by asking them this question, my aim was to get to understand what their expectations were and what they thought would enhance their chances of success in a course. The information was going to inform my teaching of the course. They were free not to participate if they did not wish to. The students were given the time they needed to respond to the question. Those who participated took about 10 minutes to write down their responses and to

submit them. After collecting students' responses, I collated them and went back to students for an open discussion in which I explained how I had understood their expectations and also asked for clarification of some of their responses. An audio-recording of the discussion of students' responses formed a secondary data set. Students' expectations as disclosed in their responses to the above question informed my teaching of the genetics course.

At the end of the course, students were interviewed to find out their learning experiences during the genetics course. A semi-structured interview was used to do group interviews. I chose group interviews because according to Bogdan and Biklen (2007), group interviews can generate a wider range of responses than in individual interviews. Group interviews can also bring together people who hold varied opinions or maybe "representatives of different collectives" (Cohen, Manion, & Morrison, 2000, p. 287). In my case, group interviews were going to bring together students who were representative of the diverse groups in my classroom. On a practical note, group interviews were going to be quick as they allow the interviewing of many students at a go. I was aware of the disadvantages of group interviews which included need for skilful interviewing, difficulties that may arise if personal matters emerge (Cohen *et al.*, 2000). I however felt that the advantages outweighed the disadvantages especially because the issue that students were going to be interviewed about was not a personal one. I also made sure that the interviews were going to be done by an experienced interviewer. Five groups of students were interviewed.

Data analysis

I used inductive coding to analyse the collated student responses and deductive coding for the interview transcripts.

Analysis of students' responses

I had a total of 136 statements of students' descriptions of their expectations. In Figure 1 below, I used the first 10 statements to show the coding process.

Students' expectations

1. Transparency: let us know in advance what will be done in the lectures (**Prior access to Teaching/Learning materials – (PaT/L)**)
2. Make PPT presentations available in advance to make preparation possible – **PaT/L**
3. Tuts and Pracs should be marked and returned to us before tests are written (**Assessment expectations – Ass**)
4. Well prepared lectures (**T/L process – TLp**)
5. Memos for pracs, tests and exams to be made available – **Ass**
6. Content explained at our level (**TLp**)
7. To be provided with sufficient notes (**TLp**)
8. Have many visual aids to help us understand the concepts – **TLp**
9. Good communication in terms of what is due, when and where as well as what the tests are on and when – **Communication on Ass**
10. Lecture notes that can be kept – **TLp**

As can be seen in the box above, the 10 student responses were about teaching and learning and about assessment. The coding of the rest of 136 responses from the class also showed these two broad categories namely students' expectations about pedagogical practices and students' expectations about assessment practices. The expectations on pedagogical practices category had three sub-categories namely: expectations about access to T/L materials, expectations about the type of T/L materials and expectations about the teaching methods.

Analysis of interview transcripts

Five interviews were done with 13 students in five focus groups. The interviews were first transcribed then analysed. To identify and to describe students' experiences as reflected in the interviews, I used what Alsop and Watts (1997), referred to as lenses. These lenses are the cognitive, the

affective, the conative and self-esteem. Although the study by Alsop and Watts was on conceptual change, I saw the four components as frames that could help me to describe how students engaged with the teaching phenomena that they were encountering during my teaching of the genetics course and hence the extent to which they had accessed what I had offered in the course. I describe these four components below.

Cognition occurs when stimuli is mentally processed by an individual resulting in the formulation of concepts about those stimuli. Therefore, the **cognitive** frame describes what happens when information in the environment is transformed into knowledge in the mind of a learner. Evidence of cognition in students' experiences can be taken to be an indication that the students are accessing what is being taught. The component **affective** refers to the expression of feelings and emotions (Nyamupangedengu, 2016). Affective expressions can be categorised as enjoyable, germane, salient and wonder. The category enjoyable covers anything that is enjoyed, liked or disliked by the students. **Germane** describes the extent to which something is personally relevant to the students. The extent to which a learning experience is prominent or important in the students' environment is what is described as salient and the fourth category of wonder describes the dimension of affective when students show amazement or awe at something they have learnt about (Lelliott, 2007). The third lens is conation which describes how a student views the knowledge and understanding s/he gained in terms of usefulness and applicability. Alsop and Watts used three elements to delineate conation; trust which is the level by which students are able to trust their understandings of the knowledge gained, control describes the quality of control students have over the use of knowledge gained and action, the degree of applicability of the knowledge gained. The fourth lens self-esteem relates to how individuals see or feel about themselves (Alsop & Watts, 1997). The aspects that cover self-esteem include image, confidence and autonomy. Image refers to the perceptions students have of themselves. Confidence describes the sense of self-belief that enables individuals to persist in the face of incomprehension and autonomy refers to the individual's capacity and motivation to pursue issues and to find answers to questions. The above descriptors of students' learning experiences can be taken to indicate epistemological access. This is because students cannot enjoy, develop confidence or show conative experiences if they are not accessing the knowledge that they are being taught.

I used the above descriptions of learning experiences as a framework for both analysing the interview transcripts and describing students' experiences of the genetics course. The analysis of interview transcripts therefore involved deductive coding. Below are two examples of coded students' utterances.

Munya: I think also the key aspect that she displayed was planning. I learned that if you're going to teach learners, and make sure that they understand, you first as a teacher must first be prepared – fully prepared – and organise each and every thing that you are going to use, so that when you implement whatever plan you had, you have, you cannot be confused and will be able to clarify any misconception and challenges that you're going to encounter-
(Germaine aspect)

Tendai: Yeah, I think that it was always nice (aspect of enjoyment) that she was always early and you could see she was always prepared, she always had something prepared for us to do. It wasn't like she stood up there and thought, "well today we'll do this...", you could see she was always prepared and that made it so much easier to trust what she was saying; to believe it – you know what I mean? (aspect of conation)

Munya's utterance shows that the planning that he experienced in the course was personally relevant to him. Therefore, the utterance was coded as reflecting germaine learning experiences. Through careful planning by the lecturer, Munya was able to access the 'goods' that the lecturer was 'distributing' in her classroom. (Morrow, 2007). Tendai's utterance *it was always nice* shows aspects of enjoyment and her reference to *trust* is an aspect of conation. These two learning experiences were accordingly coded in Tendai's utterance. I coded the first transcript and then asked a colleague to also independently code the same transcript as part of the validation process. After independently coding the transcript, I met with my colleague and discussed our coding and ironed out any differences. I then coded all the other four transcripts.

Findings and discussion

As indicated earlier, the analysis of students' responses yielded two broad categories of students' expectations. I used these categories as subheadings in the discussion of findings below.

Students' expectations about pedagogical practices

Students' responses showed that they had certain expectations regarding the T/L process. Those expectations could be divided into three sub-categories namely access to T/L materials, types of T/L materials and teaching methods. I discuss these expectations below.

Expectations about access to T/L materials

Twenty-two of the 67 students (32.8%) who responded to the open-ended question indicated that they expected access to the T/L materials before the lectures are delivered:

1. *Transparency: let us know in advance what will be done in the lectures*
2. *Make PowerPoint presentations available in advance to make preparation possible.*
3. *Tutorials to be handed out timeously*

It was clear during the discussion with the students and during interviews that students were aware of the importance of accessing lecture material before the lectures and what they could gain. A student's utterance during the discussion that followed the writing of the responses is testimony to the above claim:

Student: *When you get the lecture material in advance, you prepare and you are much more focused during lectures and sometimes you even know in advance what you don't understand*

Highlighting the need for advance access to T/L material is an indication of agency on the part of the student and as argued in the literature, agency by students is a necessary requisite if EA is to be achieved (Morrow, 2007). The student showed motivation and eagerness to learn and that motivation has the potential to promote EA.

In response to students' expectation above, I made an effort to prepare a six week long programme detailing what would be covered and in each lecture practical and tutorial and posted on the university's e-learning site together with other relevant T/L materials. The utterances by Ephy and Tendai below reflect the impact that the posting of the course materials had on students

*Ephy: She was engaged with us as a class, . . . **by having the website, Sakai**, she used that really well, like giving us all the resources we need, whenever we did a practical, she after the practical was done she would give us a memo to see where we went wrong, how we can correct ourselves, she gave us extra information on the website which helped us with the course – things that she couldn't cover in the lecture were on the website, so I think that strategy by making us all involved all the time instead of just that time that is allocated with us (**salient aspect**).*

*Tendai: The strategy gives you the opportunity to be as prepared as she is. That you've never felt like you were behind or that you had to catch up (**salient aspect**).*

Students' utterances above show that providing students with the T/L materials in advance, enabled them to prepare for lectures and to engage with the T/L materials both before and after the lectures. Providing students with T/L materials in advance is therefore a pedagogical practice that can promote epistemological access as students can be better prepared for the lectures and can engage with the materials any time before and after contact hours. Universities should therefore strive to have working e-learning systems as a way of promoting student access and success. However, discussions with the students showed that many lecturers do not fulfil this pedagogical expectation. When I reflected on my own experiences as a lecturer, I could see that one of the reasons for failing to fulfil this expectation is that preparing T/L course materials in advance that students can effectively use to study requires lots of time that I hardly have due to heavy teaching workloads. Most of the time, I find myself just fighting to keep afloat by focusing on preparing for one lecture at a time. In the study that is reported in this paper, because I was doing this study, I dedicated lots of time to the genetics course which is not something that I can sustain if I have to write journal articles and publish. Universities need to therefore, recognise that effective delivery of lectures requires time. Heavy teaching workloads and high demands for research and publications at the same time negatively impact lecturers' ability to offer pedagogical practices that will increase both access and success of our students.

Expectations on the T/L resources that students should be provided with

Forty-one students (61%) indicated that they were expecting to be given notes. Below are three examples of such responses:

1. To be provided with sufficient notes
2. Notes that are clear and summarised in such a way that the notes make sense and go hand in hand with the prescribed textbook.
3. Good lecture notes

The expectation from students of being given prepared notes reflects student under preparedness. Students' mindset which shows that even after being at university for a minimum of three years, they were still expecting their lecturer to prepare notes for them indicates how underprepared these students were for university studies. When I reflected on this situation, I wondered why so many students were not taking responsibility of their own learning. Why were they still expecting lecturers to prepare notes for them? A discussion with the students revealed that some students did not know how to prepare their own notes, others were not confident that they will prepare good quality notes and some said they commute every day, therefore there is not enough time during the course of the week for them to use the library or the computer lab to study, do research and write own notes.

Students' inability to prepare own notes confirms poor academic literacy, a well-documented challenge for many students in South Africa who come from poor educational backgrounds (Scott *et al.*, 2007). According to Scott *et al.* (2007), lack of preparedness of students going into tertiary institutions is an aspect that negatively impacts epistemological access. In their paper, Scott *et al.* (2007) made suggestions on what the higher education sector can do at both institutional level and classroom level in order to deal with student under preparedness. At institutional level, the suggestions by Scott *et al.* included change in curriculum frameworks and provision of foundational courses. However, as argued by Wingate (2007), provision of foundational courses is ineffective because the courses are generic and do not consider context and the nature of knowledge to be acquired. At classroom level, Scott *et al.* (2007) suggested that teaching should be research-informed as a way of ensuring that the support that students will get is what they need in a particular context to achieve success. Therefore, if as lecturers and as universities, we do not do research in our classrooms in order to understand the kind of support that the students in our courses would need in order to learn and to learn how to learn (Wingate, 2007), we will struggle to provide epistemological access to our students thereby negatively impacting their success at our universities. Students' responses in this study offer not only opportunities for further research but also opportunities for me as the lecturer to offer support that is

tailored to the needs of the students in my classroom. In this study, as a starting point, I made a suggestion to the lecturers in my discipline that we could help students to prepare own notes by providing a guideline in the form of headings and subheadings. Then, under subheadings have questions that students need to respond to as part of writing their notes. The headings and subheadings will give structure to the notes and the questions will guide students in terms of the important content that should be included under each subheading. The feasibility and success of this approach is yet to be investigated and while this structure may work in one discipline, it may not work in another. Hence the need for research at classroom level.

The other issue that students highlighted as impacting their learning was the issue of transport. Because students commute every day, there is not enough time for them to utilise university resources such as libraries and computer labs. The use of digital resources such as the e-learning system can alleviate the issue of insufficient time for studying as a result of commuting.

Universities can lobby or push for students to be provided with funding that allows them to buy laptops or tablets. Having a laptop of your own can enable students to download information from the e-learning systems and other online resources while still at the university and use it for studying at home after lectures and during weekends. Otherwise, EA and success at tertiary institutions will continue to elude many students from poor backgrounds.

Expectations on teaching methods

Students' responses showed that PowerPoint presentations were the most commonly used mode of teaching by lecturers. The students however expected me to use other ways of teaching such as audio/visual aids. I therefore used lots of T/L visual aids in my teaching of the genetics lecture. I also included learning activities like presentations and role playing to increase student participation during the course. The inclusion of these teaching methods positively impacted students' learning:

Ngoni: She was the first one for me, since I was here, from first year and second year; she was the first one to introduce presentation in science. Like, I haven't talked for two years in science, so like, everybody got the chance to say something about genetics, so if you didn't understand then there will be a platform to show that you don't understand and then the misconception you have will be corrected.

There are two aspects that are important to note from Ngoni's utterance above. The first one is that Ngoni displayed that by including teaching methods that required oral participation, students got chances to show their level of understanding and to be corrected where they had developed misunderstandings. This is an indication that students were accessing the knowledge that was being taught. Therefore, our pedagogical practices as lecturers can promote epistemological access. The second aspect is that Ngoni said that she had not talked for two years in the science classroom. Considering that attaining EA to any educational field is not only about acquisition of knowledge, but also about becoming a participant in practices (Morrow, 2007), it means that Ngoni had not been fully attaining EA and one reason was that no opportunities had been created that had motivated her to participate in the learning activities. Therefore, our pedagogical practices as lecturers can hinder EA at classroom level.

The 'other' teaching and learning issues

The other teaching and learning issues that students raised had to do with the teaching pace and the volume of work in class and in the course. The students were appealing for a 'manageable' pace and for the volume of work per time to be reduced.

1. Move through content at a fair pace
2. Suitable pace (not too quickly) so that we can follow and understand, manageable pace

These expectations created a challenge for me. This is because at that time, I could not offer a solution to what they were requesting. Slowing down the pace and reducing the volume of work per given time would only result in me not completing the teaching of what is specified in the course in the specified time. This scenario again highlights the need for research and for continuous social dialogue within our classroom where issues that hinder EA are discussed and collective solutions sought. Students need support on how to manage large volumes of work and lecturers need research-informed support or solutions for students.

Assessment expectations

Assessment expectations refer to what students expected with regard to tutorials, practicals and tests. Students' responses reflected the anxieties that they have when it comes to assessment and what they hope for. What the students were expecting was that firstly, all assessment tasks must be linked to content taught. Secondly, marking of all assessment tasks must be timeous. Thirdly, the lecturer and the students must review all marked tasks together as part of feedback and lastly, adequate time must be allowed for completion of tasks. For me, all these expectations were reasonable but sadly not always fulfilled due to large classes and bigger workloads among other reasons. For example, due to having a large class of 70 students, I have three Demonstrators¹ who help me in the laboratories during practical work and also help with the marking of the work. The Demonstrators' marking is not always uniform and also the quality of help they give to students also differs. This problem which can hinder both EA and success is an example of a problem that is context-specific and would require context-specific solutions hence the need to look for solutions to the issue of EA not only at institutional level but also at classroom level. Therefore, considering that students' success at university is measured by the marks they get from the assessment regimes, it is of great concern to see that our assessment practices could be negatively impacting both epistemological access and success of our students. One of the things that I started doing during the teaching of the genetics course was to randomly pick and remark 10 scripts from every practical and tutorial session to assess the quality of students' work and the quality of marking by the Demonstrators, then use my observations to give feedback to both the Demonstrators and the students. I would also use my observations to prepare and to provide students with detailed memoranda for practicals, tutorials and tests with the hope that they will be able to identify the errors and omissions they were making and learn from them. From the feedback that I got from the students during interviews, it seems that these practices were positively impacting their learning:

Ephy: . . .by having the website, Sakai, she used that really well, like giving us all the resources we need, whenever we did a practical, she after the practical

¹ Demonstrators are persons in most cases post-graduate students who help students during practical sessions and also mark the practicals.

was done she would give us a memo to see where we went wrong, how we can correct ourselves.

Having an e-learning system in place at tertiary institutions and utilising it can go a long way in increasing EA as students will be able to access, outside the contact hours, not only the teaching and learning resources but also feedback on the assessment tasks done.

Conclusion

In this study, I used a simple question ‘What do you expect from me as your lecturer for the genetics course?’ and focus group interviews to initiate social dialogue between myself and the students who were registered for the genetics course. The social dialogue was meant to help me to understand students’ perspective of what they thought I needed to do as their lecturer to ensure their success and also to help me critically reflect on my teaching so that I could become aware of the impact of my pedagogical practices on students’ EA and success. Ultimately, my aim in this study was to find out what we can do at classroom level to afford EA to our students. The study has revealed a number of factors that can impact epistemological access and success of students at classroom level. One known hindrance to EA at universities that is well-documented in the literature is the under-preparedness of many students who gain formal access to our universities. In this study, specific aspects of under-preparedness which include inability to prepare own notes and to deal with high volumes of work were identified. Suggestions were made as to how students can be supported at classroom level to overcome these difficulties. The suggestions that made a positive impact in this study were: the use of the university’s e-learning system to provide advance access of T/L materials to students and for providing feedback on assessment tasks. This study has shown that our pedagogical practices can make a difference in promoting both EA and success of our students. For example, the use of visual aids positively impacted the learning of content by students hence access to knowledge. As lecturers, we have a key role to play in order to enable epistemological access and success of our students. Practice-based research can go a long way in informing our teaching and how we can support our students to access the knowledge that we offer in our classrooms. A number of such opportunities for research and for developing deeper insights into how we can promote EA at classroom level presented

themselves in this study e.g. the over-dependence of students on academics' notes and inability to cope with high volumes of work. How can students be developed to become more independent and responsible for their learning?

References

- Alsop, S., & Watts, M. (1997). Sources from a Somerset village: A model for informal learning about radiation and radioactivity. *Science Education*, 81(6), 633–650.
- Bogdan, R.G., & Biklen, S.K. (2007). *Qualitative research for education: An introduction to theories and methods*. Boston: Pearson.
- Council on Higher Education (CHE). (2009). *Access and throughput in South African Higher Education: Three case studies*, HE Monitor No.9. March 2010. Pretoria: Council on Higher Education.
- Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in Education*. London: RoutledgeFalmer.
- Ellery, K. (2016). Epistemological access in a science foundation course: A social realist perspective. (PhD), Rhodes University, Port Elizabeth.
- Lelliott, A.D. (2007). *Learning about astronomy: a case study exploring how grade 7 and 8 students experience sites of informal learning in South Africa*. (Thesis (Ph D)), s.n.], University of the Witwatersrand, 2007. [S.l. Retrieved from <http://wiredspace.wits.ac.za/handle/10539/4480>
- Mdepa, W., & Tshiwula, L. (2012). Student diversity in South African Higher Education. *Widening participation and lifelong learning*, 13(Special Issue), 1466–6529.
- Morrow, W. (2007). *Learning to teach in South Africa*. Pretoria: HSRC Press.
- Morrow, W. (2007). *Teaching large classes*. Cape Town: Human Sciences research council.

- Mortimer, E.F. & Scott, P.H. (2003). *Meaning making in secondary school science*. Berkshire: Open University Press.
- Nyamupangedengu, E. (2016). *Teaching genetics to pre-service teachers: A teacher educator's approach to transformative practice through self-study*. (PhD), Witwatersrand, Johannesburg.
- Rollnick, M., Bennett, J., Rhemtula, M., Dharsey, N., & Ndlovu, T. (2008). The place of subject matter knowledge in pedagogical content knowledge: A case study of South African teachers teaching the amount of substance and chemical equilibrium. *International Journal of Science Education*, 30(10), 1365–1387.
- Scott, I., Yeld, A., & Hendry, J. (2007). *A case for improving teaching and learning in South African Higher Education*. HE Monitor No.6. October 2007. Cape Town: Centre for Higher Education Development, University of Cape Town.
- Wingate, U. (2007). A framework for transition: Supporting “learning to learn” in higher education. *Higher Education Quarterly*, 61(3), 391–405.

Eunice Nyamupangedengu
School of Education
Marang Centre for Mathematics, Science and Technology Education
University of the Witwatersrand

eunice.nyamupangedengu@wits.ac.za