Identifying Systemic Contradictions in a Post-Graduate Astrophysics Program

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Background
- Astronomy and Astrophysics are designated flagship areas of research in South Africa [1].
- A postgraduate structure, the National Astrophysics and Space Science Programme (NASSP) hosted by the University of Cape Town South Africa, was established.
- After six years of the NASSP, there is limited success of South African black students graduating from the NASSP. (affective issues, general learning problems and specific content difficulties at the university).
- The Extended Honours Programme (EHP), a one year bridging course, has since been designed to prepare the students for the NASSP Honours programme.

Objective
Deepen understandings of the nature of the difficulties students from Historically Black Universities (HBU) [2] face as they transit from their undergraduate to graduate studies at the University of Cape Town

Methods
- Surveys (Epistemological beliefs assessment for Physical Sciences and identity surveys)[3]
- Videotaped 2nd year Electromagnetism lectures which EHP students attended
- 1 hour Semi structured interviews of different cohorts of EHP students
- Watched and transcribed video Episodes indicating that there was a contradiction

South Africa’s education system

Contradictions in the system (Findings)
Primary Contradictions: Tension between Grades and Personal Sense Making.

Student: Yeah...like he had ways of solving a problem where we had to create bins and I didn’t understand his method so I used my own method, it was a bit longer than his but then it worked (gigles)...you know...and like...I could follow it step by step and understand what is going on, and then when he marked the paper, he said that...its good but then...((Shaking head) not that it is good- he marked it correct but then he said that it’s a poor method. So now you are stuck with the problem of...ok I understand this, I don’t understand his method and I am going to write the exam. So if he asks me the question, what is he going to mark like...is he gonna still give me mark or is he gonna reduce because he wanted it his way, so it’s like very stressful sometimes...

- personal understanding leads to fulfilment and understanding but it might have a catastrophic effect if it also leads to poor grade.
- The NASSP community values personal ownership and understanding, but the “gate keeper” is a grade which more often than not, forces students to use other strategies such as rote learning and memorization which does not aid understanding and personal ownership.

Secondary Contradictions: Tension between Students and Lecturer Status

Student: The main problem with the NASSP is that...I don’t know...they were trying to take every ummm...most of our lecturers, they were like...people with high positions...you know like (hands high in the air)...yeah. I mean you can be...you can be in those high positions, top astronomer, but it doesn’t necessarily mean that you are...you are a good lecturer or something like that...yeah...

- UCT is a research led university and there is a strong feeling that lecturers must be active researchers as this enhances the teaching. However students generally think it is best that teaching is done by those who are skilled educators.

Tertiary Contradictions: Adopting New Attitudes and Beliefs about Learning (“Epistemological Tensions”)

Student: ok...umm when I came here like...it’s like in my mind I thought maybe we are only going to do research, I thought we are not going to attend classes, something like that you see...that is why maybe when we are taught I always wanted to understand everything. I wanted to like, if they are teaching something, I just want to go in depth...like I don’t know...I thought maybe is...is going to be something different so on that part I was left behind, so maybe that is why I have struggled sometimes...that is where maybe I missed the point...

- The students imagined that learning at UCT will be very different from the styles they adopted at undergraduate at HBU’s where the students usually knew what the instructor wanted and could follow a set path to achieve the object and get a good grade.

Quaternary Contradictions (“Historical disturbances”)

Student: It’s quite a pressure because sometimes you just wanna close yourself off the family for a while and then you come back and say ok cos...like I graduated and I told them and then I told them it’s fine I will be able to fund myself, but they are still stuff I still need from home, so it becomes a problem. Like...asking for finances...and then saying...hearing them saying they are struggling its quite difficult knowing that you have a degree and you could do something to help them but you can’t because you know that in order...if you go out, you still need to come back and study again in order for you to get a promotion or...stuff at work. So it becomes a...

References