

# AN ASSESSMENT MODEL IN OUTCOMES-BASED EDUCATION AND TRAINING (OBET) FOR HEALTH SCIENCES AND TECHNOLOGY IN SOUTH AFRICA

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## **Abstract**

*The study addresses a concern in higher education and specifically in Health Sciences and Technology regarding integrated and authentic assessment with an outcomes-based approach. From the information generated, an assessment model is proposed for application in Health Sciences and Technology. By applying the Delphi technique, a validated assessment model is presented for assessment in outcomes-based education and training in Health Sciences and Technology. The process and product of the research should add value to the assessment of learning in the outcomes-based approach in higher education with specific reference to Health Sciences and Technology.*

**Key words:** Outcomes-based education and training; Health Sciences and Technology education, assessment of learning; assessment model

## **1. BACKGROUND**

The promulgation of the SAQA Act No. 58 of 1995, following the new democracy in South Africa, is regarded as the impetus for the current educational changes and reform in higher education in South Africa (SA) (Van Der Horst & MacDonald 1999:5). Consequently outcomes-based education and training (OBET) was implemented in SA. This educational approach challenges the traditional roles of academics in guiding learners to acquire vital competencies in learning facilitation and assessment of learning (Olivier 1999b:v).

Academic personnel therefore have a responsibility to become empowered with knowledge and skills in assessment of learners in the OBET approach. These new trends in assessment demand that generic and applied competence of learners in addition to traditional knowledge is assessed (RSA DoE 2001:112). This has particular reference in programmes in Health Sciences and Technology, where the outcomes that need to be attained by learners, should be accountable in the clinical procedures in the practical situation.

A major concern therefore is that traditional assessment practices as applicable to content-based education and training are still in use at most higher education institutions in South Africa.

Assessment methods currently in use may not always focus on the achievement of outcomes of knowledge and insight, competencies and skills,

as well as values and attitudes as applicable in Health Sciences and Technology programmes.

A study was conducted to revisit current assessment practices in Health Sciences and Technology at the Central University of Technology, Free State (CUT) (formerly the Technikon Free State) and the University of the Free State (UFS), with the OBET approach as background.

The aim of the study was to compile an assessment model in OBET for Health Sciences and Technology. It is anticipated that this assessment model, based on the principles of the OBET approach, should facilitate quality assessment of learning of learners in Health Sciences and Technology in the OBET approach.

## **2. LITERATURE REVIEW**

The literature review conducted reveals a number of emerging issues in assessment of learning and a trend towards assessment in the OBET approach in medical and health care education.

The promulgation of the SAQA Act in 1995 (RSA 1995) leaves higher education institutions with no option but to implement the OBET approach (Nair 2003:77). Consequently the implementation of the OBET approach in the programmes in Health Sciences and Technology is a reality at the CUT and the UFS.

Taras (2002:501) asserts that innovations in assessment in higher education are no longer an option. Assessment practices in higher education are forced to respond to demands such as to produce confident, independent and autonomous learners by looking freshly at assessment practices (Taras 2002:502).

Additionally, Luckett and Sutherland (2000:99) claim that changes in the global economy, workplace and knowledge production have affected the way in which employers see their future employees. The employers are now more concerned about the abilities of learners to learn and to reflect generic skills such as critical thinking and decision-making than their appropriate subject knowledge (Luckett & Sutherland 2000:99).

Harden, Crosby and Davis (1999:9) describe the global move towards outcomes-based education in medical education and point out that health professionals' education could benefit by adopting the principles of the OBET approach as a valuable education tool. In particular, the advantages of this approach to guide assessment of learning are highlighted. Harden (2000:437) states that by using the OBET approach, the trend to learner-centred learning continues.

Leinster (2002:15) provides the necessary motivation for changing the assessment practices of the health care professional. The author emphasises that the performance of health care professionals no longer depends on the memorisation of facts, but on their ability to use new information. This

changes the focus in assessment away from a system where recall of knowledge is encouraged to a new approach in assessment with the focus on clinical and communication skills and the development of attitudes appropriate to the clinical environment (Leinster 2002:15).

Additionally, several authors have expressed the need to reform health professions education. Stephenson, Peloquin, Richmond, Hinman and Christiansen (2002:38) found during their research that, although health professionals are confident in the clinical and technical skills, they feel insecure about dealing with the challenges in the workplace.

Friedman Ben-David, Davis, Harden, Howie, Ker and Pippard (2001:535) argue that educational reform and new assessment strategies are required to meet the needs of innovation in health professions. Appropriate assessment tools are necessary to enhance and support learning and measure performance. Therefore the use of authentic, performance-based assessment is recommended (Friedman Ben-David *et al.* 2001:535).

Friedman Ben-David (1999:23) argues that performance assessment and outcomes-based education are closely related paradigms because these approaches are bound by simple educational principles, namely that assessment methods should match the learning modality. Programmes are therefore faced with the challenge to develop non-traditional teaching and assessment techniques (Friedman Ben-David 1999:23).

### **3. METHODOLOGY**

A questionnaire for the structured interviews, based on essential elements of assessment identified in literature on assessment and the OBET approach, was designed.

The structured interviews were conducted with 16 headhunted academics from Health Sciences, Technology and higher education studies from the UFS and the CUT respectively from July to August 2002 (Friedrich-Nel, De Jager, Joubert & Nel 2003:51). The information from the structured interviews, supported and supplemented by the literature on assessment and the OBET approach, was subsequently used to compile a proposed assessment model.

The statements of the proposed assessment model were fed into the questionnaire for the Delphi process. A three-round modified Delphi process, conducted from February to August 2003, was applied to rate the statements of the proposed assessment model according to essential, useful or unnecessary statements of an assessment model.

The aim was to attain consensus on the ratings of the statements, with consensus defined as 80 percent of the Delphi panel in agreement. Additionally, the Delphi panel could rephrase and/or comment on the statements of the proposed assessment model. The Delphi panel, consisting of 10 members, represented five different areas in higher education and assessment. Findings of the Delphi process and the literature on assessment

and the OBET approach were used to compile the final assessment model in OBET for Health Sciences and Technology in South Africa.

#### **4. FINDINGS**

##### **4.1 Structured interviews**

The findings of the structured interviews indicated that the participants in the study were knowledgeable about the range of innovative (performance) assessment methods. However, the participants pointed out that they lacked the knowledge and skills to optimally make use of these innovative assessment methods. This was evident from the fact that fewer than 50 percent of the participants used an appropriate range of innovative assessment methods available in the questionnaire (Friedrich-Nel *et al.* 2003:55).

However, it should be noted that the OBET approach had not been implemented in the relevant programmes at the participating institutions at the time of the interviews. Even so, the information obtained from the structured interviews was adequate to compile the proposed assessment model in OBET for Health Sciences and Technology.

##### **4.2 The modified Delphi process**

The outcome after three rounds of the modified Delphi process used in the study, was that consensus on 60 percent of the statements of the proposed assessment model had been attained. The statements were all rated as essential elements of an assessment model, with the majority of the statements achieving consensus between rounds I and II of the Delphi process.

##### **4.3 The assessment model**

The final assessment model was presented as 65 essential and six useful statements in seven categories. With the exception of two statements, all the statements rated by the Delphi panel were included in the final assessment model. This was based on the ratings of the statements of the assessment model by the Delphi panel and verified by literature on assessment in the OBET approach.

The categories of the assessment model in OBET for Health Sciences and Technology in South Africa are subsequently presented. The statements contained in each category are attached as Appendix I.

###### **4.3.1 The purposes of assessment**

###### **4.3.2 The overall assessment strategy**

###### **4.3.3 Recommended assessment methods**

###### **4.3.4 Planning and construction of assessment**

###### **4.3.5 Practical considerations of assessment**

###### **4.3.6 Quality assurance in assessment**

###### **4.3.7 Basic qualities of and values underpinning the assessment model.**

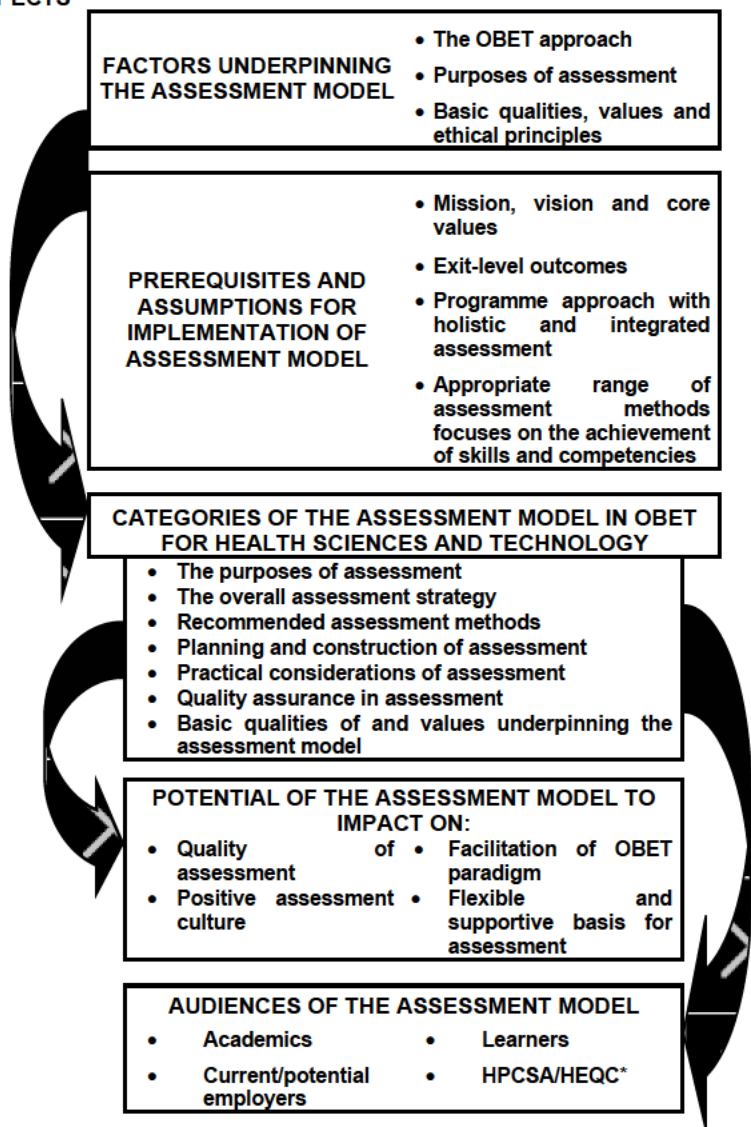
## 5. DISCUSSION

The aim of the assessment model in OBET for Health Sciences and Technology in South Africa is to benefit assessment *per se*. It was developed, designed and compiled to perform integrated and quality assessment in a programme.

The generic assessment model should provide a programme with direction to practise meaningful and holistic assessment in the OBET approach. It was thus noted that each programme should customise the assessment model with the mission, vision and core values of the institution and the exit-level outcomes of the programme as the points of departure. Moreover, the assumption was made that academics should become empowered to use innovative assessment methods, assuring the successful use of the assessment model.

The background to the assessment model with reference to the philosophy underpinning the assessment model, prerequisites and assumptions for implementing the assessment model, and the audiences of the assessment model are provided (see Figure 1).

**Figure 1: THE ASSESSMENT MODEL IN OBET FOR HEALTH SCIENCES AND TECHNOLOGY INDICATING THE VARIOUS ASPECTS IMPACTING ON THE MODEL AND THE MODEL IMPACTING ON VARIOUS ASPECTS**



\*HPCSA = Health Professions Council of South Africa

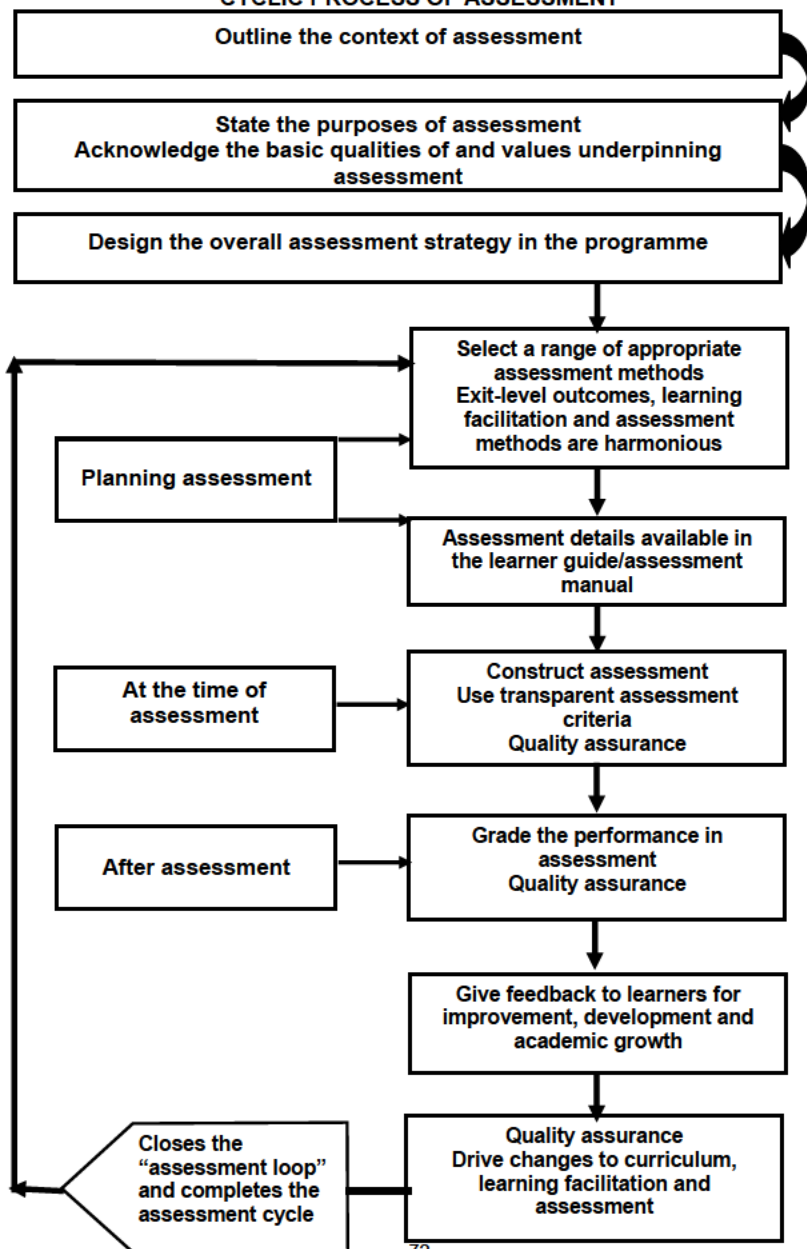
\*HEQC = Higher Education Quality Committee

The philosophy underpinning the presented assessment model is based on four principles in assessment. These principles - underpinned by literature - are assessment in the OBET approach (Coetzee-Van Rooy & Serfontein 2001:10-13; RSA DoE 2001:116; Harden 2002:117); the purposes of assessment (Brown & Knight 1995:33-37; Brown, Race & Smith 1996:16,17; RSA DoE 2001:111); and the qualities of and the values underpinning the assessment model (Brown *et al.* 1996:8,142,143). Assessment in the OBET approach is a continuous process based on a holistic and integrated approach to facilitate learning. Assessment should be conducted in a manner to enable progress and academic development of learners. Therefore, it should be closely aligned with the teaching and learning processes in the programme (Coetzee-Van Rooy & Serfontein 2001:10,13). The second principle as backdrop for the present assessment model is the purposes of assessment (Brown & Knight 1995:33-37; Brown *et al.* 1996:16,17; Brown, Bull and Pendlebury 1997:11; RSA DoE 2001:111). In this context of the study it covers the following aspects: that assessment should be based on the provision of an educational experience to the learner; it should be formative as a tool for learning and summative as a tool for validating that learning has taken place; it adds direction in learning facilitation; it guides the academic improvement of learners with feedback on assessment; reflects shortcomings in learning facilitation; and is used for grading of performances of learners (Brown *et al.* 1996:16,17; Brown *et al.* 1997:11). The third and the fourth principles as bases of the assessment model presented here are the basic qualities of and the values underpinning the assessment model (see Figure 1). The aim to outline the qualities of and values underpinning the assessment model is to enhance the ethical practices in assessment of learning. Palomba and Banta (1999:83) reiterate that learners, being valuable partners in assessment, should be treated with respect. The audiences of the assessment model are learners, academics (facilitators/assessors), employers, the professional bodies of the Health Professions Council of South Africa (HPCSA) and the Higher Education Quality Committee (HEQC) (see Figure 1). The assessment model is directly aimed at academics (facilitators/assessors) performing assessment and at the learners who are doing assessment. By using the assessment model, facilitators in Health Sciences and Technology are guided to practise meaningful and quality assessment of learning. Learners, as partners in assessment, should be guided to take responsibility and accountability for their own learning. The assessment model is indirectly aimed at current or potential employers, as well as at the professional bodies of the HPCSA and the HEQC. Employers (current/future) could play an active role in the implementation of the assessment model with particular reference to performance assessment and/or assessment of skills performed in practice. By implementing the assessment model in the programme based on the requirements of the professional bodies of the HPCSA, it permits a format for verification and benchmarking for accrediting and quality assurance bodies such as the HPCSA and the HEQC.

In the next section of the discussion the focus is on a practical approach to assessment of learning in Health Sciences and Technology. The assessment

model was integrated with the cyclic process of assessment and presented as a diagram for practical use (see Figure 2).

**Figure 2: INTEGRATION OF THE ASSESSMENT MODEL AND THE CYCLIC PROCESS OF ASSESSMENT**





The assessment model as outcome of the present study integrates the procedures, activities and events of the complex process of assessment of learning. In reality these procedures, activities and events occur simultaneously and are often repeated. The arrows in Figure 2 are used to indicate the flow of events of the cyclic process of assessment. Additionally, they link the various events in assessment and restate that assessment of learning is an integrated process.

With the wide range of possible purposes of assessment, the New Academic Policy (RSA DoE 2001:111) indicates that this also means that the different audiences in assessment have different expectations in assessment of learning. Learners want to find out about their academic progress and learning, while assessors and facilitators do assessment to grade learners and assist them in their academic development by providing feedback. Employers are interested in the outcome of assessment to find out if learners, as current or future employees, make progress in learning and mastering of knowledge and skills. This is indicated by the exit-level outcomes of the relevant programme linked to the professional vocational profile of the profession (RSA DoE 2001:111).

Brown *et al.* (1996:142) describe the “assessment manifesto” containing the ideal principles of assessment of learners in the programme. By using these guidelines when assessing learners, academics respond positively to the vital requirement of ethical practices in assessment. This brings to the fore the responsibility of academics to place a high priority on quality assessment of learners; to take the assessment of learners seriously; and to practise assessment in a responsible manner.

The overall assessment strategy in the programme is planned and designed in an integrated way and holistic manner and led by a group of facilitators to avoid fragmentation of assessment. It provides a framework within which assessment of learning can take place in an organised manner so all involved can cope with the demands in assessment. Moreover, it facilitates harmony between assessment and learning facilitation in the programme.

Assessment of learning with the appropriate range of assessment methods provides a vehicle to present evidence of the learning process of the learner. Literature advises the design of criteria based on the “fit for purpose” principles with which the most appropriate assessment methods in the programme are selected (Palomba & Banta 1999:87). The appropriate assessment method should correspond with the learning outcomes and learning facilitation methods. Assessment methods to assess critical cross-field outcomes such as problem-solving and reflection skills and assessment of performance in practice should be selected.

It is advised that a planning/assessment grid should be used to plan, guide, facilitate and encourage the assessment of a variety of cognitive levels in assessment. In addition to Bloom's taxonomy, Biggs and Collis (1982:181), Imrie (1995:186) as well as Killen and Hatching (2004:77) advise the use of the

Structure of the Observed Learning Outcome Taxonomy (SOLO) as a framework for judging the quality of learning and the structure of, for example, essays and medical diagnoses. Imrie (1995:186) adds that it also serves as a research-based measure of the quality of learning outcomes included in assessment.

A marking scheme or rubric with the relevant assessment criteria should accompany assessment for grading purposes and to facilitate feedback to the learner. The assessment criteria should be transparent to learners and, where indicated, negotiated with the learners.

The use of an assessment schedule, containing the relevant and required information on assessment activities, tools and assessment criteria, helps to provide the learner and the facilitator with direction and transparency in assessment. The assessment criteria provide a means for feedback to the learner. The feedback encourages the learner to reflect on assessment for future improvements, academic development and achievement.

The quality assurance process in assessment is the important link to complete the assessment cycle (see Figure 2). Quality assurance in assessment is integrated and should take place in every action of the assessment process for improved quality in assessment. The assessment schedule provides a framework for the documentation and recording of learner achievement. Facilitators could use this for reflection on and improvement of the assessment process.

Fowell, Southgate and Bligh (1999:276) mention the phases in quality assurance in assessment with quality assurance as the last phase. Fowell *et al.* (1999:281) recommend that a long-term view should be taken at the assessment process to identify trends and deficiencies in the curriculum. By doing this, assessment drives the changes in the curriculum that again could improve assessment in the programme. This starts a new cycle of assessment and does what Banta (2000:1 of 4) recommends, namely to “take that second look” at the assessment results. This action closes the assessment cycle, a necessary requirement for meaningful assessment (see Figure 2).

The quality of assessment could thus be improved by implementing the assessment model presented in the study. By using the assessment model, the potential to add value to assessment of learning exists. For the same reason, quality assurance processes could be used to verify, benchmark and determine the “graduateness” of qualifications in health care.

Moreover, the assessment model could be used as an educational tool by academics and learners to facilitate and encourage the change to assessment in the OBET approach. In this manner, it has the potential to impact on the current educational paradigm and assessment culture.

Palomba and Banta (1999:344) point out that an assessment culture consists of assumptions, ideas, customs, values and beliefs on assessment shared and transferred to others. These authors (Palomba & Banta 1999:345) argue that

an assessment model provides the required energy for change. The assessment model in OBET for Health Sciences and Technology therefore has the potential to provide a means to establish a positive assessment culture for the benefit of all role-players involved in assessment. Dochy and Moerkerke (2000:32) mention the use of an assessment culture to change instruction from a system that deposits knowledge into the heads of learners to one that tries to develop learners who are capable of learning how to learn, thereby encouraging meaningful learning. Angelo (1999:2 of 6) requests colleges and universities to change from “teaching factories” into “learning communities”. By creating learning communities, the author (Angelo 1999:2 of 6) says faculty and learners are working together to attain significant learning goals and use assessment as a method to promote learning. Additionally, Barr and Tagg (1995:3,4 of 16) mention that learning is promoted and produced in the “Learning Paradigm” where learners take the responsibility of their own learning. Palomba and Banta (1999:245) quote Judy Sorum Brown who asks a very relevant question, namely: “Why is it so difficult for an institution of learning to be a learning organization?”

The assessment model should provide educators and learners with a flexible and supportive structure combining the requirements of meaningful assessment to add value to assessment. Each programme should respond to the assessment requirements by adapting the assessment model to suit their individual needs. Involvement of academics and/or learners to “custom-make” the assessment model in the programme, helps them to become part of the assessment process. As a result, the activity is not forced on academics and they consequently could take responsibility and ownership of the assessment model. Brown and Knight (1995:129) mention that assessment programmes should be customised to the circumstances of the department or programme to be valid.

Using the assessment model to establish a positive assessment culture; to encourage meaningful assessment; and to add value to assessment of learning may not always impact positively on assessment. Once the assessment model has been implemented, unique limitations and obstacles at programme level may come to the fore that will have to be dealt with. Brown and Knight (1995:130) offer recommendations in overcoming these obstacles. These authors recommend the establishment of an assessment office/committee supplying powerful support from senior management to those involved in innovative assessment. In addition, they advise the development of assessment expertise among academic staff. This initiates the importance of continuous reflection on assessment and the use of the assessment model to adjust and improve learning facilitation and assessment in a programme.

## **6. CONCLUSION**

Assessment of learning is a complex process with the potential to add value to learning and thereby enhancing the learning experience of the learner. The generic assessment model in OBET for Health Sciences and Technology was designed to provide direction in and transparency to assessment of learning in a programme. It is considered to be adjustable and resilient in addressing the

diversity of educational and assessment needs as required by the variety of programmes in Health Sciences and Technology.

By using the assessment model as an educational tool, assessment of learning in Health Sciences and Technology in SA could be repositioned as a process that matters to academics, learners, the institution, accrediting bodies, as well as current and future employers. If academics in Health Sciences and Technology are encouraged to use the assessment model as a tool to practise quality assessment, they should become passionate about assessment. The desired result should lead to the establishment of a positive assessment culture in the programme, faculty and - ultimately - in the institution. Thus, by means of the assessment model, assessment could be repositioned at the centre of learning activities in higher education in SA.

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