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Strategies for implementing outcomes-based education at the Technikon Free State

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The decision of the South African Qualifications Authority (SAQA) that all qualifications should be registered in outcomes-based education (OBE) format on the National Qualifications Framework (NQF) by 2000 forced all higher education institutions to take this approach to teaching and learning seriously. A research project on the implementation of OBE at technikons in 1999-2001 provided further reinforcement (CTM 2001). In this article the most important strategies used by the Technikon Free State (TFS) to implement the theoretical framework of OBE within the national higher education context are discussed. The implications of implementing OBE are also highlighted. Technikons are well-positioned to implement OBE, since the basic tenets of its theory and practice are similar to their traditional teaching philosophy.

Strategieë vir die implementering van uitkomsgebaseerde onderwys by die Technikon Vrystaat

Die besluit van die SA Kwalifikasie-owerheid dat alle kwalifikasies op 'n interim basis — in uitkomsgebaseerde formaat — op die Nasionale Kwalifikasie Raamwerk geregistreer moet wees teen 2000 het alle hoëronderwysinstellings gedwing om erns te maak met dié benadering tot onderrig en leer. 'n Navorsingsprojek oor die implementering van uitkomsgebaseerde onderwys (UGO) gedurende 1999-2001 aan die technikon het verdere steun aan die benadering verleen (CTM 2001). In die artikel word die belangrikste strategieë wat die Technikon Vrystaat (TVS) gevolg het om die teoretiese raamwerk van UGO binne die nasionale hoëronderwyskonteks te implementeer, bespreek. Die implikasies van die implementering word ook uitgespel. Technikons is goed geposisioneer om UGO te implementeer, omdat die teoretiese vertrekpunte van die benadering en die grondslae van UGO nie vreemd is aan die tradisionele onderwysfilosofie van die instellings nie.

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The purpose of this article is to discuss certain strategies used by the Technikon Free State (TFS) to implement the theory of outcomes-based education (OBE) in the national higher education (HE) context.[1]

OBE is not a new approach to teaching and learning. It is the label currently given to developments in education over the past four decades and can be defined as a learner-centred approach in which the focus is on the ultimate results of the learning process, called "outcomes", and on the processes that will guide learners towards achieving those outcomes.

The learning outcomes form the starting-points from which all the processes (curriculum design, instruction and assessment) are planned (Du Toit 2002: 2). As a learner-centred and results-orientated approach, OBE has the following fundamental beliefs (Van der Horst & McDonald 2001: 5-6):

- All learners must be allowed to attain their full potential.
- Positive and ongoing assessment should grant learners opportunities to attain their full potential.
- The learning environment should create conditions conducive to learner success.
- All stakeholders in education (educators, learners and parents) are responsible for learning, in terms of both curriculum development and implementation.

1. Theoretical foundation

According to Van den Horst & McDonald (2001: 7-11) four educational approaches form the theoretical foundation of what is now called OBE. These approaches date back to the middle of the twentieth century.

1.1 Educational objectives

Tyler's *Basic principles of curriculum and instruction* (1950) identified a number of key issues, which educators should consider in developing

1 Although the Technikon Free State has been awarded the status of a University of Technology, the context of the research was technikon education. The article will therefore refer to technikons rather than using the new nomenclature.

and planning instruction. These are: educational purpose (including objectives), content, organisation, and evaluation. Tyler stressed the importance of formulating clear objectives for educational experiences. A well-formulated objective should describe what a learner must be able to do after instruction as well as the content to which the learner's action applies. Bloom (1956) placed these objectives in a hierarchical system, from simple to complex: knowledge through understanding, application, analysis, synthesis and evaluation. This system is well-known in curriculum development and instructional design.

1.2 Competence-based education

Towards the end of the 1960s people in the USA (especially businessmen) started asking whether education was preparing students adequately for life, especially with regard to the skills needed in the workplace. This led to the introduction of competence-based education, which focused on integratimg the following:

- outcome goals (in terms of skills),
- instructional experiences (to teach these outcomes), and
- assessment devices (to determine whether the learner has attained the outcomes).

Unfortunately, competence-based education failed because it was reduced to a remedial programme and educators could not agree on what should be considered essential "competencies".

1.3 Mastery learning

Bloom and his school of thought believed that 90-95% of learners could master most objectives, given the proper conditions. Thus the concept of mastery learning abandoned the idea that learners have greater or lesser potential, and can achieve more or less success. In this approach, the onus is on the educator to provide the necessary conditions for effective learning. It is an educator-controlled, rather than a learner-centred approach. Its contribution to OBE was that it stressed the importance of ensuring that learners are granted opportunities to succeed, and of providing an appropriate learning environment, materials and back-up guidance.

1.4 Criterion-referenced assessment

This form of assessment refers to testing in which the scores of learners are not compared to those of other learners, but to a given criterion or standard of performance. Criterion-referenced assessment measures the mastery of very specific objectives. As such it is very appropriate for OBE, since it places a learner's assessment outcome against clearly formulated assessment criteria. Criterion-referenced results should be interpreted and used to adapt the instructional process.

1.5 Characteristics

From these four educational approaches, which together form the theoretical foundation of OBE, the following characteristics of OBE were deduced:

- Nearly all learners are able to succeed, given that their prior knowledge, level of proficiency and needs are analysed.
- Learners must be able to use learned knowledge and skills, rather than merely absorb prescribed content.
- What the learner must be able to do after instruction (the learning outcomes) must be stated as clearly and unambiguously as possible.
- Assessment criteria and devices should determine whether the learner has attained the outcomes.
- Appropriate learning materials should be in place. Curriculum development is to be regarded as an ongoing process of analysis, reflection and improvement.
- An appropriate learning environment and guidance should be provided to ensure that learners are granted maximum opportunities to succeed.
- Learners have to accept responsibility for their own learning. The educator becomes a facilitator of the achievement of outcomes, not merely a presenter of knowledge (Van der Horst & McDonald 2001: 12; Du Toit 2002: 5-6).

2. Implementation context

Certain national policy and legislative documents have important implications for teaching and learning at higher education institutions. These include the following:

2.1 The South African Qualifications Authority Act, 1995 (Act no 58 of 1995)

As a result of this Act, SAQA was established with the task of implementing and operationalising the National Qualifications Framework (NQF). The following objectives of the NQF, as outlined in the SAQA Act, have implications for higher education programmes:

- to create an integrated national framework of learning achievements;
- to facilitate access to, and mobility and progression within education, training and career paths;
- to enhance the quality of education and training;
- to accelerate the redress of past unfair discrimination in education, training and employment opportunities, and thereby
- to contribute to the full personal development of each learner as well as the social and economic development of the country.

The principles of the NQF directly affect programme and curriculum development in technikon education, as pointed out by Genis (1997: 57-68).

2.2 White Paper 3: A Programme for the Transformation of Higher Education

One of the goals of the transformation of higher education is to promote human resource development through programmes which are responsive to the social, political, economic and cultural needs of the country and which meet the best standards of academic scholarship and professional training (Dept of Education 1997a: par 1.28).

2.3 The National Plan for Higher Education (NPHE 2001)

The NPHE provides the framework and mechanisms for the restructuring of the higher education system in order to achieve the vision and goals outlined in White Paper 3. It has some general implications

for programme matters, such as the integration of academic development programmes into the overall academic planning of an institution, the approval of the programme mix at each institution, and the necessity for collaboration between institutions on programmes and infrastructure (Dept of Education 2001a).

2.4 The New Academic Policy (NAP)

The purpose of the NAP (released in 2001 as a discussion document) is to give effect to the policy guidelines set out in White Paper 3 and the NPHE. It aims to provide the academic framework to underpin the NPHE, and "is based on the assumption that, for the time being at least, SAQA's model of outcomes-based education is the dominant paradigm of curriculum development in South Africa" (Dept of Education 2001b: 112).

Once finalised and approved, the NAP will replace the policies on which the Interim Joint Committee of the Higher Education Quality Committee has relied to determine the accreditation and approval of programmes and qualifications. These policies are set out in the well-known NATED 116 (for universities) and Report 150 (for technikons) — documents which are now outdated in the context of the transformation agendas of White Paper 3 and the NPHE.

2.5 Development of Level Descriptors for the National Qualifications Framework

This discussion document was released by SAQA almost simultaneously with the NAP at the end of 2001. As the title suggests, it deals exclusively with the development of level descriptors for all levels of the NQF — descriptors which are of paramount importance for the finalisation of all qualifications and curricula in outcomes-based format.

2.6 Implications

Together these documents introduced new policies on higher education's vision and challenges in South Africa. As far as teaching and learning are concerned, the National Standards Body (NSB) Regulations (SAQA 1998: par 11) stipulated that SAQA may, with effect from 1 July 1998 to 30 June 2003, grant interim registration to each

existing qualification previously approved by an agency recognised by SAQA, with the proviso that:

- each qualification be submitted to the Authority (in a format approved by SAQA) for recording before 1 July 1998, and
- such qualification so recorded is submitted between 1 July 1998 and 30 June 2000, in a specific format, to one or more NSBs for processing.

All qualifications were to be submitted to SAQA before June 2003 for final registration on the NQF. This deadline has since been postponed to 2006, because certain crucial documents (such as the NAP and the Development of Level Descriptors) have not been finalised and approved.

These SAQA provisions required all higher education institutions to recast their qualifications in outcomes-based format. This requirement has led to the large-scale development and implementation of OBE at all institutions.

2.7 The initiative of the Committee of Technikon Principals (CTP)

An important initiative relating to OBE was launched under the auspices of the Committee for Tutorial Matters (CTM) of the CTP. The general notion of OBE, with its concepts of outcomes, competence, credits and articulation, was not entirely new to technikons. For example, the attainment of career knowledge and skills is a basic tenet of the technikon philosophy, as is the idea of co-operative education.

After the 1998 recording of qualifications, a technikon-wide curriculum committee was established, with its core group to work in close collaboration with the CTM. This group identified five major research projects in 1999, namely the development of level descriptors, modularisation, the re-alignment of assessment, the development of learning guides and the identification of the implications of implementing OBE. These projects were to be based on qualifications registered on the NQF.

The research that followed involved voluntary participation by teaching and academic support staff from all technikons in four preliminary projects on assessment, modularisation, learning guides and

level descriptors. This was followed by analyses of qualifications and learning programmes that implemented the concepts and findings of the foregoing projects and aimed to determine all possible implications that technikons would have to take into account in planning the implementation of OBE.

According to Genis (2001: 7) the research on the implementation of OBE may be considered the capstone of technikon curriculum research in 2000. A framework of questions was designed by the core curriculum working group to determine how OBE would affect existing teaching practices at all technikons, as well as their wider governance, financing and administration. Programmes were selected from the arts, engineering, natural sciences, health, and economics. Teaching staff were required to analyse their existing qualifications, based on their submissions to SAQA in 2000, by selecting a possible modular structure, mapping it and determining all the academic and administrative implications of implementing the new structure. This research also drew on the preliminary research projects on modularisation and assessment.

The results of the projects were published in February 2001 in four CTM booklets on modularisation, assessment, learning guides and the implications of OBE implementation. This last booklet (Genis 2001: 25) recommended the following:

- All qualifications currently recorded were to be reviewed and their outcomes, credits and assessment criteria revisited, in preparation for the final recording of qualifications by June 2003.
- Modular structuring and mapping exercises were to be conducted for all learning programmes, and the implications of such structuring formulated as part of a three-year process.
- This process was to be approached in an organised way, piloting selected projects rather than attempting simultaneous modularisation of all programmes.
- Plans for implementation were to be supported by senior management.

Following these recommendations, many technikons began the process of redesigning their curricula, modules and assessment practices. At the TFS a project on the implementation of OBE was launched,

a consultant was appointed and an implementation plan for 2002-2004 was approved by Senate in November 2001. The project was based on the research findings and recommendations of the CTM curriculum working group, as reported in the four booklets published as part of the CTM Quality Promotion series. Other technikons (Natal Technikon, Vaal Triangle Technikon and Pretoria Technikon) launched similar projects and appointed consultants or full-time curriculum developers to assist in the development and implementation of OBE. The majority of technikons became (to a greater or lesser extent) engaged in a continuous process of curriculum development, adapting and redesigning their curricula, assessment processes and learning guides in OBE format.

3. Technikon Free State strategies

The phases of the project at the TFS have been the following: orientation on OBE, selection of pilot programmes, workshops on aspects of OBE (such as curriculum development and modularisation, assessment, study guides, learning facilitation and experiential learning), guidance and support for project teams, implementation of OBE in pilot projects and, finally, recommendations on the implementation of OBE in all learning programmes.

The following strategies have been used by the TFS ro redesign all learning programmes in OBE format. Some of them are in line with the CTM curriculum working group, while others are new or in contrast to the findings of the group.

3.1 Replacing a strict syllabus-based curriculum with a more flexible outcomes-based curriculum

The current learning programmes comprise a collection of subjects at various levels, each with its own credit allocation (Report 151, Dept of Education 1999). The transformation of the learning programme to accommodate the module as the building block is more difficult than was originally envisaged. No one would argue that discipline-based knowledge is not essential to any successful process, but to simply fragment individual subjects into modules and provide them with "outcomes" as many (the majority of?) colleagues have done, is

not outcomes-based education. Spady (1994: 1), a primary exponent of OBE, sees the approach as incorporating both systemic and curriculum change:

> Outcomes-based education means clearly focusing and organising everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences. This means starting with a clear picture of what is important for students to be able to do, then organising curriculum, instruction and assessment to make sure that this learning ultimately happens. Thus OBE is a structured and integrated process in which outcomes are first formulated, then outcomes and assessment are linked, then the appropriate content is identified and incorporated into a learning guide to facilitate learning — all aimed at assisting the learner to achieve the said outcomes (Du Toit 2002: 53).

The shift to OBE is more difficult in some fields of study than in others, due to the needs of industry. The heads of departments of Civil Engineering at technikons, for example, have decided to retain subject names so as not to confuse industry with what technikons are currently doing, in relation to what they want to do in future. Industry still demands certain subjects in the curriculum, for instance Water Engineering 2 or Geotechnical Engineering 2.

The problem is that staff usually retain subjects and merely repackage them as modules, instead of formulating programme outcomes and defining modules that would lead to their achievement. Experience at the TFS has shown that, as engagement with OBE principles and practice continues, academic staff move away from the subject-based interpretation of modules. However, this is a long-term process, requiring extensive staff development.

3.2 Keeping in touch with initiatives (policies and plans) at national level

National documents are not always finalised on schedule. For example, it was originally envisaged that higher education institutions could begin re-designing their programmes and qualifications for alignment with the NAP in January 2003. All these qualifications were then to be submitted to SAQA for full registration in June 2003, and the NAP was to have been implemented from January 2004 (SAQA 2001: 121). At the time of writing (November 2003) the NAP has not been

approved and the deadline for the final registration of qualifications has been extended to 2006.

Such delays make the planning and implementation of OBE very difficult indeed. The development of level descriptors for designated degrees at universities and technikons is another example of the slow progress at national level. These descriptors are crucial for the formulation of exit-level outcomes and, as long as final documents are outstanding, Reports 150 and 151 remain applicable.

At the heart of the problem lies Report 151, which is subject-based and has a prescribed credit system. Report 151 creates serious problems for both academic and administrative staff at the TFS. Academically it would be counter-productive to link the new OBE modules to the subject-based Report 151, as has been made clear in the above discussion. Until Report 151 has been repealed, administrative staff are unable to register students for properly developed modules in OBE format, because the titles of the modules do not (and are not supposed to) fit prescribed subjects. The TFS will not receive state subsidy for students not registered for the subjects listed under each Classification by Educational Subject Material (CESM) category.

The implications are that the TFS and other technikons should not proceed too much faster than national developments, which still have to finalise parts of the conceptual apparatus of the NQF necessary for the registration of students in pilot projects.

3.3 Distinguishing clearly between learning programmes and modules

A learning programme with its outcomes forms the point of departure for curriculum development in an OBE paradigm. It represents the framework for the development of modules. This means that the outcomes of the learning programme and the outcomes of the modules should not duplicate each other. Modular outcomes are refinements of the outcomes of learning programmes.

Some convenor technikons are not aware of this basic distinction and start the curriculum development process with modules. The fact that these technikons are still struggling with the process of curriculum development within the OBE paradigm causes frustration

among the other technikons, which depend on them to take the lead in developing and submitting qualifications. This is why the new CTP initiative to get funding from the CHE for curriculum development at technikons is strongly supported.

3.4 Considering the relationship between programme (exit-level) outcomes and modules as flexible

OBE is an integrated approach, in which everything in the educational system is organised around clearly formulated learning outcomes (Spady 1994: 1). This includes the identification of modules. It became clear that, in some cases, an exit-level outcome could form a perfect basis for a module. However, in the majority of cases the exit-level outcome is too complex and comprehensive, and modules should rather be based on specific outcomes. Even then the relationship between a specific outcome and a module need not be a one-to-one relationship.

The implication is that no strict rules are to be defined concerning the relationship between outcomes and modules. The hierarchy of outcome statements, which is expressed in the exit-level outcomes and their specific outcomes, should be recognisable in the modular map (Genis 2001: 19). Once this is done, the map forms a sound basis for discussion.

3.5 Linking outcomes and assessment criteria as clearly as possible

When reflecting on the qualification outcomes recorded with SAQA in 2000, it was found that the exit-level outcomes were less effective than had been thought. The credit and level allocations could be questioned and the assessment criteria were found to be too broad or only vaguely linked to the outcomes, thereby complicating the identification of modules.

The implications for curriculum development are that qualification and exit-level outcomes should be reviewed and scrutinized on a continuous basis, and that the link between these outcomes and the assessment criteria should be as precise and clear as possible in order to ensure the success of the whole exercise.

3.6 Avoiding the danger of fragmentation

This issue has been discussed at many workshops, including one at Technikon Pretoria in July 2001, and it remains high on the agenda. A fundamental principle of OBE is that the learning programme should exhibit cohesion and not be characterised by independent and unrelated modules which do not logically lead to the attainment of the outcomes of the qualification. The linkages between modules are critical, therefore, and the structuring and sequencing of modules have to support these linkages.

The point is that integrated and applied competence can not be achieved via fragmented, unrelated modules. Project teams at the TFS therefore mapped out the modules that constitute the learning programme for a particular qualification and ensured that they exhibit the necessary cohesion.

3.7 Guarding against over-small modules

There is widespread concern that scholarship may be compromised if learning is broken down into small, narrowly-defined modules. The design of modules has to contribute to the holistic view of the competence to be attained. More comprehensive modules are better for the attainment of cross-disciplinary knowledge and skills.

At the TFS we agreed on a minimum size (credit allocation) for modules in order to prevent the generation of learning programmes with too many small modules. The average size of our modules is 16 credits, with 32 credits being the largest.

3.8 Determining the placement of experiential learning

The placement of experiential learning as a typical technikon methodology to facilitate competence achievement is critical in programme structuring. Cooke & Dinkelmann (2001: 17) are of the opinion that experiential learning should be distributed throughout the learning programme. According to Genis (2001: 21) some programmes will place it as a separate module at the end of the programme, that is in the final year of study, while others will place it after foundational knowledge has been achieved. What emerged from the CTM's research was that the nature of the qualification (ie whether it was a BTech

degree or a National Diploma) influenced the placement of experiential learning.

Experience has shown the placement of experiential learning requires further research and discussion. This is one of the objectives of the CTP's initiative on curriculum development, referred to under 3.3.

3.9 Formulating outcomes with a view to the assessment of prior learning (RPP)

The American Council for Adult and Experiential Learning (CAEL) has been responsible for a number of works on prior learning and assessment, the most important being Whittaker's *Assessing learning: standards, principles and procedures* (1998). In the wake of Whittaker's work, ten standards have been internationally adopted for assessment for the purposes of the recognition of prior learning. First and foremost is that credit should be awarded only for learning which has actually occurred. "Seat time", hours on the job or life experience should not be calculated in assessing learning. It is the learning which has occurred — the specific knowledge, competenc and skills which have been acquired — that is creditworthy. (This standard has been accepted by technikons in the Committee of Technikon Principals' Policy on RPL, 2001: 27-8).

In order to perform such an assessment, modules with clearly formulated outcomes and credits need to be in place. This is an important impetus for project teams working on OBE implementation and contradicts the remarks of Cooke & Dinkelmann (2001: 21) and Du Toit (2002: 74) that experience should also be considered in assessing prior learning.

The implications for OBE implementation are that outcomes have a central role in the assessment of prior learning and that candidates will be assessed against the same outcomes as traditional students, with the same grading system: very competent, competent or not yet competent.

3.10 Identifying competent team leaders and appointing a full-time curriculum developer

Seminars and workshops are necessary for the orientation of personnel. However, such workshops, with their mainly theoretical approach and information on basic OBE concepts, seldom stimulate staff to engage in redesigning their learning material. People tend to disappear after orientation sessions if no-one takes the lead immediately. If someone does come forward at a later stage, s/he must start the process all over again.

Experience has shown that strong project leaders, guided by a curriculum expert or facilitator, are indispensable for successful implementation. Project teams should meet on a weekly or bi-weekly basis, according to an agreed implementation schedule. They should work in collaboration with a curriculum expert who has the necessary know-how and authority to guide the process, to avoid duplication and to solve problems or disputes among team members. The responsibility for developing the module remains with the individual staff member who is the owner of the module and will eventually deliver it to his/her learners. However, to ensure the success and quality of the product, strong leadership and a full-time curriculum developer are essential.

Thus, costly seminars by outside experts should be limited to the minimum. Project leaders, guided by an internal, full-time curriculum expert, should immediately take the process forward and arrange team meetings on a continuous basis.

3.11 Enhancing teamwork among teaching and administrative staff

The OBE approach requires the integration of knowledge, skills and attitudes in order to achieve the learning outcomes. This implies teamwork, both among teaching staff themselves and between teaching and administrative staff.

Once the learning outcomes have been formulated, elements or units of subjects need to be clustered in order to achieve them. This implies the engagement of staff from various departments/disciplines, as well as block allocations for learning in a module. Thus teamwork among teaching staff is essential for OBE implementation.

Teamwork between academic and administrative staff is equally important. Administrative staff should be just as informed about OBE as academics, because they play a crucial role in the development of module codes, in the registration of students for the modules and in the capturing of credits. Experience has shown that administrative staff are eager to co-operate in curriculum development, if they are given the opportunity and the time to do so.

This enthusiasm is characteristic of nearly all project teams at the TFS. The level of familiarity with OBE and the capacity to implement it varies within and across teams but there is a general willingness to attend curriculum development workshops and to work together as team members, as long as curriculum developers are available on a full-time basis and temporary staff are appointed to assist them. This general need for assistance validates the observation of Genis (2001: 16) that "the capacity in staff and curriculum development units might have to be strengthened to meet the demands for system-wide curriculum change".

We found that multifunctional project teams should drive curriculum development, that the spirit of teamwork among teaching and administrative staff should be enhanced and that curriculum experts should be available (on a full-time basis) to guide and monitor the implementation process.

3.12 Preparing students for the OBE model of instruction

The fact that assessment criteria are clearly formulated and linked to outcomes is responsible for the perception among students that OBE is an easy way to obtain a qualification. In our experience, learners need to be systematically introduced to the OBE model of instruction. Without the necessary paradigm shift, learners will not be convinced of the need to take responsibility for their learning and will not benefit from the efforts of educators to make the necessary changes. Comprehensive study and assessment guides will have to be introduced in order to empower learners to accept responsibility for their own learning. Learners will also have to be trained in the new assessment techniques made possible by the use of electronic media.

The implication for the TFS is that resources should be allocated to prepare students for the new system. Counselling sessions and guidance regarding the selection/combination of modules and the demands of taking responsibility for their own learning are crucial to the successful implementation of OBE.

3.13 Piloting selected programmes for OBE implementation

This was one of the most important recommendations of the Curriculum Work Group of the CTM: that piloting selected programmes is preferable to the simultaneous modularisation of all programmes (Genis 2001: 24-5). This recommendation is supported by the experience of the TFS. It is advisable to begin on a small scale with pilot projects, to identify and solve problems in such projects and to systematically build up expertise and know-how before tackling OBE implementation on a grand scale.

A major advantage of collaborating in pilot teams is the feeling of success that participants experience when the dissemination of their results is publicly recognised and acknowledged. Participants feel free because they can be creative and experiment with a new approach to teaching and learning. During the project they form alliances and networks, share a common culture, speak the same language and belong to the same paradigm, thus feeling that they belong and are respected.

For the TFS as a whole, pilot projects will ensure the implementation of OBE in an organised way and will safeguard the institution against waste of money or human resources.

3.14 Developing software as an integral part of the curriculum design process

On the surface it seems quite simple and straightforward to make newly developed material available on the Intranet, but experience has shown that this cannot be done in isolation or after the process has been completed. Courseware material cannot simply be upgraded without participation in the formulation of the outcomes of the qualification. Experts in electronic learning should thus be part of the curriculum development process from the very beginning. They should

collaborate with project team members on a continuous basis, especially in the design of learning guides.

3.15 Developing the infrastructure to advance the process

Part of the OBE project at the TFS is to develop an infrastructure that will ensure ongoing attention to curriculum development once the project is completed. Participants in the project will be in a position to develop the capacity of others. Apart from future seminars for all staff, a core of project team leaders has received intensive training and mentoring and should act as key figures in planning and executing OBE implementation at the institution as a whole.

Curriculum change does not happen on its own: it requires leadership, well-designed processes, diligent follow-up and continuous improvement.

4. Conclusion

The purpose of this article was to discuss the strategies used by the TFS to implement OBE within its theoretical framework and the research done by the Core Curriculum Workgroup of the CTM. The strategies are in line with the characteristics of the theory, expand on them and confirm the main findings of the working group. The implications of these strategies, as well as the steps necessary to advance the process, have also been identified. With their close collaboration with industry and commerce, their applied teaching and research philosophy, and their practice of experiential learning, technikons are well positioned to implement the underlying beliefs of OBE.

One of the best strategies for implementing OBE is to start with pilot projects and to take sufficient time for planning and reflection. Identifying competent team leaders, appointing a full-time curriculum developer, establishing sound relationships between academic and administrative staff and, above all, obtaining co-operation from students will, in our experience, ensure the success of OBE implementation.

Implemented with the correct intentions and on sound pedagogical foundations, OBE will ensure that graduates are more competent and confident, and can take their rightful place in society.

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