

Aligning TVET Education programmes with industrial demands in South Africa: An international comparative analysis of TVET Curriculum Development Frameworks for Four Countries

Dr Manager Mhangarai Muswaba (FCIS)
Ekurhuleni East TVET College, South Africa
mgr@secretary.net

Table of Contents

DESCRIPTION	PAGE
1. Background and Motivation.....	3
2. Research Problem and Specific Research Questions.....	4
2.1 Research Problem.....	4
2.2 Specific Research Questions.....	5
3. Main Purpose of the Research.....	6
4. Industrially Oriented Stakeholder Integrated (IOSIA) Curriculum Development Framework.....	7
5. Hypotheses.....	9
6. Research Population and Sample Size.....	9
6.1 Research Population.....	9
6.2 Research Sample.....	9
7. Study Methods and Design.....	10
7.1 Study Methods.....	10
7.2 Study Design.....	10
7.3 Data Collection.....	10
7.4 Data Gathering Instrument and Processing.....	11
8. Data Analysis.....	11
8.1 Quantitative and Statistical Methods of Data Analysis.....	11
8.2 Qualitative Methods of Data Analysis.....	12
9. Ethics.....	12
10. References.....	13

1. BACKGROUND AND MOTIVATION

Through their pivotal and influential role in society, Technical, Vocational and Education and Training (TVET) colleges are key stakeholders in achieving economic sustainability regarding the provision of workforce (Cortese, 2003). As respected thought leaders, TVET colleges have the opportunity to elevate the importance of sustainable development in all the facets of industry.

Since 1998, the transformation of TVET colleges has moved to the forefront of the political agenda in the Republic of South Africa. This research was identified due to the failure of TVET colleges National Certificate Vocational curriculum and programmes to meet stakeholder needs, in spite of having received huge funding from the national government in recent years (HRSC 2010).

President Jacob Zuma (2017) in his State of the Nation address states that "...the processes that we have set in motion draw to a close, such as the Heher Commission, the Ministerial Task Team, broader engagements with students, university and TVET leadership and civil society, we will find resources to give expression to our policies". The president further invited all stakeholders to participate in the processes that were underway regarding TVET education promotion.

Research has shown that employers are having a difficult time finding workers that have the right knowledge and skills needed for available jobs despite there being high rates of unemployment (Winsman, 2010). This is mostly the greatest problem in South Africa where TVET College graduates with TVET qualifications are finding it very difficult to convince the employers that they have the skills to take up posts. This research project looks at a historical view of how TVET programmes and curriculum have failed to meet workforce needs. The same have also failed to meet the employment projections, employer needs, as well as not responding to the call to develop a highly skilled workforce. In addition, a model designed to partner industry and all education institutions in the development of TVET educational curriculum needs is urgently needed to promote conversation on how South Africa through integrated stakeholder curriculum development should better prepare future TVET graduates with the competencies and employability skills needed to perform in an ever-changing workforce.

In order to keep up with workforce demands over the next decade, it will be crucial for South Africa to keep their finger on the pulse of the skills and TVET education needed by workers to not only fill anticipated jobs, but to adequately prepare workers to compete in an educationally progressive world. Employers in South Africa have indicated that they are having difficulties finding employees that have the skills needed for the jobs that are available, despite TVET colleges churning out high numbers of TVET graduates, they cannot be absorbed by industry without required skills (HRSC, 2010).

In the National Department of Higher Education and Training (DHET) grand strategic policy (PSET:2013) brief entitled White paper on Post School Education and Training, state lawmakers recognised this need and presented a challenge to public colleges to develop a plan of response to workforce needs. This is supported by the research made by the American Association of State Colleges and Universities which identified that educational institutions are particularly affected by a number of changing times (American Association of State Colleges and Universities, 2011) and therefore needed to modify how they operate as a result of intrinsic responses to a perceived need or extrinsic responses through stakeholder collaboration (American Association of State Colleges and Universities, 2011).

The White paper on post school education (PSET:2013) also clearly states that one of the Department of Higher Education and Training's (DHET) top priority is to strengthen and expand the public TVET colleges. DHET further lists some of its key strategic objectives as that of strengthening colleges through "... building partnerships with employers, increasing the responsiveness of colleges to local labour markets, improving placement of college graduates in jobs, and creating a mix of programmes and qualifications that will meet the varied needs of industry" (PSET:2013).

2. MAIN RESEARCH PROBLEM AND SPECIFIC RESEARCH QUESTIONS

2.1 Main Research Problem

The overall responsibility of the National Department of Higher Education and Training (DHET) of South Africa is to ensure delivery of quality education within the system through encouraging and initiating innovations. DHET is also responsible for ensuring that the Higher Education and TVET institutions maintain minimum standards of acceptable educational practices that are relevant to the economic demands of the national industry.

The public perception regarding TVET education in South Africa is that the quality of education offered is low and that standards have even further dropped. These perceptions are based on lack of adherence to acceptable educational practices. The perception is also that the learning environment in the public TVET colleges does not promote effective learning. A detailed survey commissioned by the government also confirmed that the quality of TVET education offered at the TVET colleges was low level (HRSC, 2010). There are however a few ongoing staff development programmes that seem to be effective in the TVET sector specifically occupational skills programmes.

There is however a clear vacuum that the government has created when it comes to addressing the issue of creating a mix of programmes and qualifications that seeks to meet the national industry requirements. It is evident that TVET sector is using TVET curriculum which was

created by academics only. This is working retrogressively in relation to the government's strategic objective outlined above as the current curriculum was developed by academics with some of them having little or no understanding of industry requirements or local needs.

The adoption of market responsive TVET curriculum is well overdue in the TVET sector in South Africa. The government through the DHET should respond to the President's call for Radical Economic Social Transformation by moving away from the archaic centralised, command and only academic control dominated curriculum development model and radically move towards what one would call "**Industrially Oriented Stakeholder Integrated Approach (IOSIA)**" for all TVET programmes curriculum development. DHET should start promoting Radical TVET Education Transformation through reviewing the model that they are using to review and develop this sector's curriculum programmes.

The Pedagogy for Employability Group (2006) defined employability as a set of achievements, skills, understandings and personal attributes, that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy" (The Pedagogy for Employability Group, 2006). However, some researchers argue that knowledge and skills are simply not enough and that an additional focus should be placed on student experiences and opportunities to engage in measurable functions which would serve to enhance employability (Foskett, 2005).

This research in support of the IOSIA model aims at establishing the extent of alignment of TVET programmes with the current industrial demands and trends when all the stakeholders are involved in these programmes and curriculum development. This would be done by the researcher paying special attention to the assessment of the programmes in South Africa. The research would also further establish the extent of collaboration between TVET and industry in the curriculum development of programmes with a view to enhance employability skills of TVET graduates in line with the government's white paper on post school education strategic objectives.

2.2 Specific research objectives

The research objectives are as given below:

- to identify synergistic industry-DHET institution collaborations in curriculum development,
- to suggest how to link TVET institutions with industries framework and other key stakeholders in curriculum development of programmes,
- to identify the common problems faced during programmes curriculum development and suggest solutions.

3. MAIN PURPOSE OF THE RESEARCH

South Africa has a lot of initiatives to their disposal to increase the TVET educational attainment and employability of TVET graduates. The Department of Higher Education and Training Minister, along with President Zuma, state government, and national higher education and training associations, have set up aggressive goals for educational attainment in South Africa over the next three decades (PSET: 2013). The goals enshrined in the PSET not only focus on attainment of post school TVET qualifications but also place an even higher focus on TVET educational quality and relevance (PSET: 2013). The current learning outcomes on TVET curriculum does not clearly allow students to demonstrate key skills that serve to enhance employability as the curriculum does not address the current industrial advancement in terms of production systems and technology.

Assessment of curriculum to meet workforce needs is an idea that TVET education is one of the major catalyst of relevance and therefore South Africa needs to look at providing a policy framework that promotes an integrated stakeholder approach rather than academic systematic approach (Jones and Harrington: 2002). Jones and Harrington further suggested that collaboration is a vital step in producing economic change through curricular reform. They also emphasised the importance of a proactive approach by higher education and training through the creation of strategic partnerships with employers in key sectors in order to develop programs to meet 21st century workforce needs.

Once the TVET curriculum has been assessed and workforce needs identified, curriculum development could then include the modification of existing courses, the development of new course offerings, and the sequential grouping of those courses to meet targeted goals (Phillips, Settoon, & Phillips, 2008). For example, in a study of undergraduate business students in America, curriculum was developed to improve self-efficacy and employability by integrating real-world experiences related to the area in which students might seek employment (Ehiyazaryan & Barraclough, 2009). Students were involved in activities such as contract negotiation, complex communications, and team collaboration. The results of the study indicated strong evidence related not only to the development of transferable workplace skills, but also pointed to an increased awareness of how to articulate those skills in a resume or future employment interview.

Howard (2007) emphasised the importance of designing curriculum to develop real-world, transferable workplace skills for both students and industry. He further outlined opportunities for the incorporation of problem-based learning activities to help students learn and to be able to apply key concepts, a skill that many employers see as lacking in graduates. Howard (2007) further went on to suggest that, although the opportunities for change exist, the work involved in identifying workforce needs and developing a coherent, problem-based curriculum to meet those needs is not easy.

It is evident that in South Africa, the gap is widening between knowledge generated through training systems of TVET Colleges, and the skills demanded by employers. Thus, the research argues that the root cause emanates from the curriculum development where the two major stakeholders are missing each other. It is therefore against this background that the research recommends that a collaborative model on development of TVET curriculum development be developed in which the industry should also take an active and leading role, providing contemporary skills by collaborating and establishing networks with the DHET and other curriculum development bodies, thereby minimising the misalignment.

The researcher's view is that a collaborative Framework could be one of the important means that could establish a highway to bridge the gap and to enhance employability skills of TVET graduates in South Africa. This will help to meet the workforce needs of industry as well as bringing sustainability to the TVET colleges sector. Most importantly, this will contribute highly to the ideology of radical education transformation in support of the radical economic transformation that the government is promoting (State of the nation address by president Zuma, 2017).

4. INDUSTRIALLY ORIENTED STAKEHOLDER INTEGRATED APPROACH (IOSIA) TVET CURRICULUM DEVELOPMENT FRAMEWORK

There are various options that South Africa can leverage regarding the development of TVET curriculum, however in order to have a relevant and sustainable system, partnerships and collaboration should be at the core of the processes, as suggested by Figure 1 below. The Industrially Oriented Stakeholder Integrated TVET Curriculum Development Framework (IOSIA) model is designed with three assumptions in mind, that is

- the process should be simple and sustainable;
- the process should provide an avenue to enhance curriculum and not reinvent it
- the process should begin and end with the stakeholders or partners involved in developing the curriculum.

The IOSIA model is a simple model that starts with an *assessment* of the workforce environment through various stakeholders (educational institution, business and industry, local government, regional economic development or workforce TVET education structures, students, and SETAs). This step would allow the stakeholders structures assigned with curriculum development to determine specific goals and skill sets that would benefit students and enhance employability.

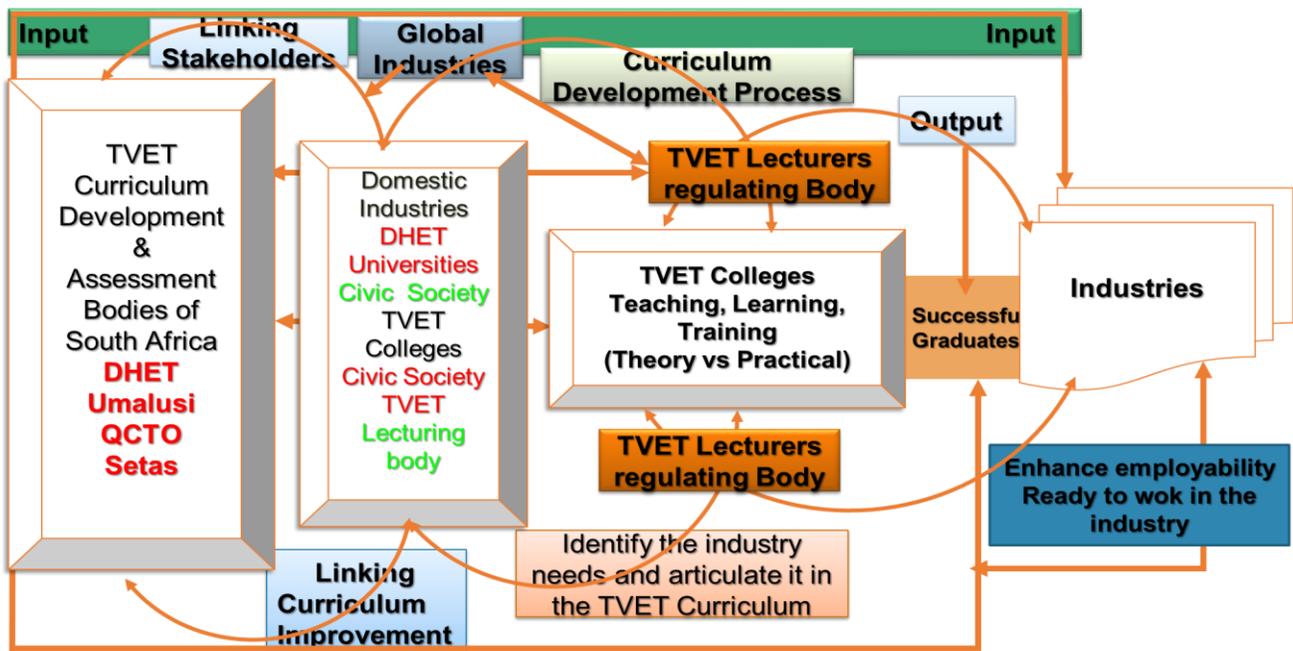
After completion of the assessment of each of the programmes or curriculum by stakeholders, an analysis would follow by comparing the identified goals and skill sets to existing curriculum to locate gaps. Although the model could be used to completely revamp an entire curriculum, the logistics associated with developing an entirely new curriculum and receiving the necessary approval to implement that curriculum may not be conducive to formulating a

curricular product that can be put into place in a timely manner. Therefore, it is recommended that, industry and all TVET education partnerships can either reveal a need for a new curriculum, or alternatively can recommend adding components to existing curriculum or programme to accomplish the desired goals.

The second phase of the model entails the implementation by TVET colleges, thus putting into practice what was established in the programme or curriculum development phase, analysis phase, and modification phase. It is expected that TVET college lecturers would incorporate new learning experiences selected and designed to close the gaps identified by stakeholders as important and necessary for employability. Learning experiences would ideally involve real-world situations in order to assess the ability of students to apply what they know.

Finally, as the third phase of the model represents a perpetual design, the curricular modifications and the results of student learning would then be assessed by stakeholders. Positive outcomes on the success of graduates is highly likely. A comprehensive product from the implementation of the IOSIA framework is expected to be absorbed by the industry, as their involvement in curriculum and programme development enhances their buy-in and at the same time strengthens the relevance, employability, and readiness of TVET graduates to meet industry needs.

Figure 1: Industrially Oriented Stakeholder Integrated Approach (IOSIA) Framework



Source: (researcher proposed model)

5. HYPOTHESES

There has been a variety of research over time, investigating the relationship between the characteristics of any organisation and its disclosure as stated by Cowen et al. (1987:212) and Gay et al. (2001:512). It is clear that these benefits are also directly related to the sustainability of TVET Colleges and their success.

It would seem apparent therefore that there should be some attention paid to the development of relevant TVET programmes and curricular that is responsive to the socio-economic demands of the country. It also becomes imperative to conduct an investigation and analyse international frameworks on TVET education curricular and programmes development. The proposed countries for South Africa to draw lessons from are Germany, Finland and Cameroon. These countries have been sharing best practices with South Africa in terms of education, training and development and have developed strong bilateral relations in this field of education, training and development.

It therefore becomes possible to state the following hypotheses in relation to TVET programmes and curricular development:

- H₀.** Integrated stakeholder approach to TVET programmes and curriculum development in Germany, Cameroon and Finland has resulted in the employability of graduates by the industry in these three countries.
- H₁.** Integrated stakeholder approach to TVET programmes and curriculum development in Cameroon, Germany and Finland has not resulted in the employability of TVET graduates by the industry in these three countries

6. THE RESEARCH POPULATION AND SAMPLE SIZE

6.1 Research population

The target population for this study can be defined as DHET, NSFAS Umalusi, QCTO, SETAS, Industry, and TVET Colleges in South Africa as well as curriculum development bodies of TVET education in Cameroon, German and Finland. The population constitute the major stakeholders involved in the curriculum development in the TVET sector.

6.2 Research Sample of study

This research will use a number of stakeholders both nationally and internationally as the subjects for research. The research will collect data from the DHET, NSFAS, Umalusi, QCTO, SETAS, Industry, and TVET Colleges in South Africa as well as curriculum development bodies of TVET education in German, Finland and Cameroon.

7. STUDY METHODS AND DESIGN

7.1 Study Methods

An array of existing theories and prior academic findings on curriculum and programmes development from a number of countries both in developed and developing countries will be compared and contrasted. These will be fitted with empirical evidence of what is happening in Finland, Cameroon and Germany. Matrices will also be developed to intercept the key curriculum development perspectives with the study propositions.

In order to achieve the research aim and objectives, the study design draws on theories of stakeholder curriculum development models. Theoretical insights from the literature are then combined with the emerging literature on curriculum development. The research approach relies on a limited case analysis, drawing data primarily from the DHET, Umalusi, QCTO, SETAS, Industry, and TVET Colleges in South Africa as well as Curriculum Development bodies of TVET education in German, Cameroon and Finland.

7.2 Study design

The design of the study would be descriptive and cross-sectional. The study would be descriptive as the purpose of the study is to explore and describe factors that affect the alignment of TVET curriculum and programmes to industry needs. The study would also be cross-sectional as data is being gathered from respondents only once.

7.3 Data Collection

Data collection is done by means of a structured questionnaire, where respondents will provide responses verbally as well as written responses. Several questionnaires will be considered during the research. A questionnaire, designed to measure integrated curriculum development in many facets of TVET programmes, will be adopted in its entirety for the purpose of this study. The research will develop a comprehensive questionnaire that will enable organisations to audit their commitments to stakeholder approach to curriculum development (Best and Kahn 1993).

A structured questionnaire was chosen for this research because of its benefits. Best and Kahn (1993:23) indicate that structured questionnaires are less time consuming, relatively objective, easy to tabulate and analyse and help respondents to focus on the subject. Zikmund (2003:144) describes secondary data as books and periodicals. Secondary data will be collected by conducting an extensive literature study, focusing on topics such as curriculum consumers, end product consumers, assessors and examiners and economic environment responsiveness.

7.4 Data gathering instruments and processing

Zikmund (2003) mentions that a questionnaire is relevant if the information that is needed can solve the identified problem. A questionnaire is also accurate if the information obtained is reliable and valid. In order to obtain accurate information, questions to be developed need to be interesting and easy to answer. The structured questionnaires chosen are relevant, as they address programmes and curriculum development aspects identified in the problem statement.

Questionnaires for the baseline study will be sent to one hundred members through a workshop to all local stakeholders. The response will be collected during the workshop which will then be analysed. After this pilot analysis a review of the instrument is done and second round will be done with the same pilot sample and then the instrument will be finalised.

The instrument will also be used to a sample which will include both local and international stakeholders identified from the selected three countries.

The questionnaire will have various questions including the yes or no questions. These will be followed by open-ended questions that will allow respondents to give detail to their opinions.

Questions that involve frequency counting will be coded and will be processed using STATA statistical software package (Version 11). All reasons and explanations will be summarised and recorded according to their occurrence in the questionnaire.

8 DATA ANALYSIS

Gay (1996:96) indicates that a good research plan must include a description of the statistical technique(s) used to analyse data. Questionnaire items will be subjected to successive first and second order analytical procedures. Resultant factors with high reliability coefficients will be subjected to statistical testing in order to ascertain possible statistically significant relationships. Swetnam (1998:670) prefers bar charts and graphs as graphical instruments in order to interpret results easily in an attractive manner.

8.1 Quantitative or statistical methods of data analysis

The following statistical methods of data analysis shall be used to provide answers to the research questions in this study:

- Frequency tables, bar charts and pie charts for categorical variables of study
- Summary statistics, box plots and histograms for continuous variables of study
- The Pearson chi-square test of association among pairs of relevant variables of study

- Binary logistic regression analysis (multivariate method of data analysis). Adjusted odds ratios shall be used as an econometric measure of effect. The reliability of the fitted logistic regression model shall be assessed based on standard diagnostic procedures.

The statistical package STATA version 11 shall be used for data entry and analysis.

8.2 Qualitative Methods of data analysis

A combination of both quantitative and qualitative methods of data collection and analysis shall be used in this study. This is because not all research questions can be answered based on quantitative methods only. There are questions that could only be answered based on in-depth interviews with senior managers, planners and decision makers. Coding, text analysis, discourse analysis, triangulation, etc will be used as part of the qualitative methods of data analysis. Focus group interviews will also be conducted, and their establishment shall be based on core functional responsibilities. Focus groups shall be internally homogeneous and externally heterogeneous. Interviews will be recorded on tape recorders, and later transcribed. Coding shall be done by three suitably qualified and independent assessors. The coded data shall be analyzed, and interpretations provided.

9 ETHICS

De Vos, et al. (2002:63) indicate that the following ethical aspects are important to consider during the research:

- Informed consent: respondents need to be informed beforehand as to the intent of the study.
- Deception: no information that could possibly change the decisions of the respondents must be withheld
- The intent and mandate to do the study must be clear from the onset.
- Anonymity: questionnaires must be completed anonymously to ensure the privacy of the subjects.
- Confidentiality: all the information must be treated in a confidential manner.
- Publication of findings: a written report must be compiled which must be done as accurately and objectively as possible.

The researcher will inform the participants that the response will remain anonymous and that their voluntary co-operation is appreciated. An undertaking will be given to avail research results to the respondents as advised by Schumacher and McMillan (1993:182).

10 REFERENCES

ACTE. 2010. *CTE's role in worker retraining*. ACTE Issue Brief. Retrieved from http://acetonline.org/uploadedFiles/Publications_and_Online_Media/files/Retraining_Issue_Brief_WEB.pdf.

AMERICAN ASSOCIATION OF STATE COLLEGES AND UNIVERSITIES. 2011. Top 10 higher education state policy issues for 2011. *AASCU Policy Matters*. Retrieved from <http://www.congressweb.com/aascu/docfiles/PM-Top10for2011.docx.pdf>

BEST, W.J. AND KAHN, J.H.1993. *Research in Education*, Boston: Allyn and Bacon.

CORTESE, A.D. 2003. The critical role of higher education in creating a sustainable future, *planning for Higher Education*, Vol. 31 No. 3

DE VOS AS, STRYDOM H, FOUCHÉ CB & DELPORT CSL 2002. *Research at grass routes: For the social sciences and human service profession*, 2nd Edition, Van Schaik, Pretoria.

EHIYAZARYAN, E. & BARRACLOUGH, N. 2009. Enhancing employability: Integrating real world experience in the curriculum. *Education + Training*, 51(4). 292-308

FOSKETT, R. (2005). Collaborative partnership between HE and employers: A study of workforce development. *Journal of Further and Higher Education*, 29(3).

GAY, LR. 1996. *Educational research: Competencies for analysis and application*. Columbus, Ohio: Charles E Merrill.

HOWARD. J. 2007. *Curriculum development*. <http://org.elon.edu/catl/documents/curriculum%20development.pdf>

HSRC/NTB (Human Science Research Council/National Training Board). 2010. *Investigation into the training of artisans in the Republic of South Africa*. Pretoria: HSRC.

JONES, E. & HARRINGTON, C. F.2002. *Improving the fit: How to use assessment data to connect university curricula to workforce needs*. University Continuing Education Association: Washington DC. ED463685

PHILLIPS, A. S., SETTOON, R. P., & PHILLIPS, C. R. 2008. ENHANCING A CURRICULUM: A FOCUS ON THE development process. *College Student Journal*, 42(4). 1070-1074. Retrieved from EBSCOhost.

SCHUMACHER, S. AND MCMILLAN, J.H., 1993. *Research in education: a conceptual introduction*. New York: Harper Collins College.

DEPARTMENT OF HIGHER EDUCATION AND TRAINING, 2013. White Paper for Post-School Education and Training

SWETNAM, D. 1998. Writing your dissertation: how to plan, prepare and present successful work', Oxford: How to books.

THE PEDAGOGY FOR EMPLOYABILITY GROUP. 2006. *The Pedagogy for Employability Group: Pedagogy for employability*. The Higher Education Academy: York.

ZIKMUND, W.G. 2003. *Business research methods*, 7th edn, Thomson Learning, Ohio.

ZUMA, J.G. 2017. State of the Nation Address by Jacob G Zuma, President of the Republic of South Africa on the occasion of the Joint Sitting of Parliament Cape Town, <http://www.gov.za/speeches/president-jacob-zuma-2017-state-nation-address-9-feb-2017-0000>