AN APPROACH FOR THE IMPLEMENTATION OF TECHNOLOGY EDUCATION IN SCHOOLS IN THE NORTH WEST PROVINCE

By

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Thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy in Technology Education in the Faculty of Education at the School of Postgraduate Studies in the North West University of the Mafikeng Campus

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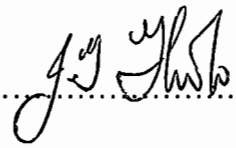
DEDICATION

This work is dedicated to my late parents Karel and Rose Tholo who taught me to be thankful and to trust in God. It is also dedicated to my wife Segomotsi and children: Realeboga, Tlhomamo and Oabile for their support.

DECLARATION

I declare that the thesis for the Degree of Doctor of Philosophy in Education (Technology Education) at the North West University (Mafikeng Campus) hereby has not previously been submitted by me for a degree at this or any other university, that it is my own work in design and execution. Sources quoted have been duly acknowledged and indicated by means of a comprehensive list of references.

Signature:  .....

Jacob Adam Thabo Tholo

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SUMMARY AND KEY TERMS

Technology is the generic term that includes all the technologies people develop and use in their lives. In the learning area it is the purposeful application of knowledge, experience and resources to create products that meet human needs and wants. Technology education is an integrated programme designed to prepare learners about Technology. Learners are challenged to discover and create solutions to problems by using a variety of tools, machines and materials.

The study is about the implementation of Technology as a learning area with specific reference to the North West Province. There is no approach for implementing Technology in the North West Province. Technology Education needs approaches that build upon the best thinking in the field and take into account the needs of the learners and the educators. The approach needs to address the context within which Technology is offered. The main aim of the study was to design an approach for implementing Technology Education in schools in the North West Province.

In this study the qualitative and quantitative research designs were employed to gather information regarding the implementation of Technology in schools in the North West Province. A survey questionnaire (quantitative) was used to compile data regarding the profile and perception of Technology educators. A learner questionnaire (quantitative) was also administered to determine the attitudes and concepts of learners towards Technology. Interviews (qualitative) were conducted with the Technology experts, subject specialists and learning area heads. A population of 7149 educators and 216489 learners was used. The sample involved 7734 learners from five education regions of the North West Province and 345 educators (almost five percent of each educator and learner population). Two hundred and eighty-eight learners were selected in each school, comprising of ninety-six learners from each of the grades 7, 8 and 9. Fifteen respondents were interviewed and they comprised of four Technology experts, four education specialists and seven subject heads.

The research as stipulated above yielded the following results:

- When Technology was introduced in the GET band in 1998, educators were not ready with regard to the paradigm shift and transformational goals to eradicate the legacy of the past;
- There is a shortage of physical and human resources for implementing Technology. In terms of human resources, there is an adequate number of educators teaching Technology in each school, but some of these educators were not equipped with content knowledge to teach the learning area;
- Educators received in-service training for Technology, but the training was insufficient because it simultaneously introduced educators to OBE and Technology learning area specifics. There are consistencies in the implementation of Technology which are as a result of not having followed proper policy processes;
- Educators who are from the Engineering studies and Home Economics background seem to limit Technology to their own field of specialization. Another group of Technology educators are those qualified in the sciences that see Technology as the application of Science. The third group of educators is those who teach other learning areas and they need a lot of support to raise their confidence;
- Overall, educators are positive about the opportunity the learning area provides in teaching career and entrepreneurship. They however feel despondent because of lack of resources and poor training.
- It is interesting to note there are positive and negative items in the attitudes graphs. The most positive item was that Technology is very important in life. The item that elicited the greatest negative response was almost the same for both gender groups. This response is that Technology is only concerned with computers. It seems that all learners are receptive to technological change and its importance and they recognize its diversity;
- The data on concepts and attitudes towards Technology indicates that as learners progress from grade 7 to 9, their attitude become more positive and this depends on how Technology is taught in the classroom;

- It also seems that the greatest gain in positive concept and attitude occurs in grade 7, where the difference between the age groups is the greatest. This difference is progressively minimized to grade 9; and
- There was significant main effect for the variable of gender on attitude, meaning that there is a significant difference between boys and girls in the positiveness of their attitudes towards Technology, with boys being more positive. This is considered a negative finding, and emphasizes the importance of gender equity programmes in Technology education. Therefore studying Technology seems to have no effect on minimizing the difference between genders.

Key terms: Technology, Technology Education, Curriculum, Implementation, and Approach.

ACRONYMS AND ABBREVIATIONS

ABET	– Adult Basic Education and Training Band
ANOVA	– Analysis of Variance
C2005	– Curriculum 2005
CASS	– Continuous Assessment
CDT	– Craft, Design and Technology
CEM	– Council of Education Ministers
CJSS	– Community Secondary Schools
CUMSA	– Curriculum Model for education in South Africa
DACST	- Department of Arts, Culture, science and Technology
DFID	– Department for International Development
D&T	– Design and Technology
DET	– Department of Education and Training
EMS	– Economic and Management Sciences
ERS	– Education Renewal Strategy
ESTE	- Elementary School Technology Education
FET	– Further Education and Training Band
GCE	– General Certificate of Education
GDR	– German Democratic Republic
GET	– General Education and Training
HEDCOM	– Heads of Education Departments Committee
HEI	– Higher Education Institutions
HSC	– Higher School Certificate
HSRC	– Human Sciences and Research Council
IACP	– Industrial Arts Curriculum Project
ICHED	– Interim Committee of Heads of Education Departments
INSET	– In-service Education and Training
IPM	– Industrial Project Method
ITEA	– International Technology Education Association
MEC	– Member of the Executive Council

MST	– Mathematics, Science and Technology
NCS	– National Curriculum Statements
NGOs	– Non-Governmental Organisations
NIC s	– Newly Industrialized Countries
NPC	– National Projects Committee
NQF	– National Curriculum Framework
NS	– Natural Sciences
NSW	– New South Wales
NTT	– National Task Team
OBE	- Outcomes Based Education
ODA	– Overseas Development Administration
ORT	– STEP – ORT Science Technology Education Project
PATT	– Pupils' Attitudes Towards Technology
PROTEC	– Programme for Technological Careers
PTT	– Provincial Task Team
RDP	– Reconstruction and Development Programme
RNCS	– Revised National Curriculum Statements
SAQA	– South African Qualifications Authority
SAARMSTE	- Southern African Association for Research in mathematics, Science and Technology Education
SETA	– Sector Education and Training Authority
SPSS	– Statistical Programme for the Social Sciences
SSS	– Senior Secondary Schools
STEP	– Science Technology Education Project
STS	– Science Technology Society
T2005	– Technology 2005
TAFE	– Technical and Further Education
UK	– United Kingdom
USA	– United States of America
WCED	– Western Cape Education Department
WOCATE	– World Council of Association of Technology Education

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