AN INVESTIGATION INTO THE SKILLS AND COMPETENCIES REQUIRED OF NON-ENGINEERING BUILT ENVIRONMENT PROFESSIONALS IN SOUTH AFRICA.

Adewale Abiodun Sorinolu

A research report submitted to the Faculty of Engineering and the Built Environment, of the University of the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for the Master of Science in Building.

DECLARATION

I declare that this research report is my own, unaided work. It is submitted in partial fulfillment of the requirements of the degree of Master of Science in Project Management in Construction in the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

____________________________
Adewale Abiodun Sorinolu

___________day of ________________2008.
Sustaining reconstruction and development, on the scale designed by the South African government – in particular enhanced provision of infrastructure – will require adaptable, available and competent built environment professionals. This research report investigates the skills and competencies required of non-engineering built environment (NEBE) professionals, and evaluates the perceived disparity that exists between the level of importance given to each of the competencies required of NEBE professionals in South Africa today and the level of importance given to each of the competencies that have been published in literature as ideal for each profession.

To achieve this study’s objectives, a questionnaire was developed using information from literature review and pre-test questionnaires administered to a select set of NEBE professionals. The questionnaires were completed by 58 professionals from a non-probability sample of NEBE professionals in Gauteng province of South Africa. Propositions relating to the objectives of the study were developed using the data obtained from the questionnaires.

The study has established that: **professionalism; leadership/management; solving problems; knowledge and practice of construction; and planning, design and supervision** are the most significant core competencies currently required by NEBE professionals in South Africa. Furthermore, NEBE professions still lag behind in the development of Professionalism. It is advocated, therefore, that Professionalism should be encouraged and promoted at all levels amongst NEBE professions.
DEDICATION

I dedicate this report to my parents,

His Royal Highness Samuel and Elizabeth Sorinolu
ACKNOWLEDGEMENTS

I am sincerely grateful to:

My supervisor, Dr. Adesola Ilemobade, for his competent guidance, relentless support, availability for consultations and speedy feedback on my submissions.

Professor Alfred Talukhaba, Late Dr. Joseph Kekinde, Bode Akindele, Maria Famuyiwa, Janet and Dolu Johnson for their various invaluable contributions. Dr. R.N. Nkado, for the wealth of knowledge drawn from his MBA research report.

Professor Elizabeth Pienaar, Head of School Construction Economics and Management and entire staff for their individual support that culminates into achieving a speedy completion and submission of this research report.

All non-engineering built environment professionals that immensely contributed to the success of this research by giving their quality time to filling and returning the questionnaire survey sheet.

University of Witwatersrand, Johannesburg, for admission to study and financial support.

My beloved wife, Rachel, for her patience, long suffering and loving encouragement in my extended pursuit of academic excellence, and our blessed, precious children Comfort and Courage for their comfort, encouragement and endurance throughout my Masters’ programme.

My heavenly father, the almighty God, source and provider of wealth of knowledge, for the divine knowledge availed me to commence and complete the whole Masters’ programme successfully.
TABLE OF CONTENTS

DECLARATION...........................................................................................................ii
ABSTRACT...............................................................................................................iii
DEDICATION...........................................................................................................iv
ACKNOWLEDGEMENT.........................................................................................v
TABLE OF CONTENTS..........................................................................................vi
GLOSSARY OF TERMS.............................................................................................x
LIST OF ABBREVIATIONS......................................................................................xii
LIST OF TABLES..................................................................................................xiii
LIST OF FIGURES..................................................................................................xv

CHAPTER ONE: INTRODUCTION

1.1 Overview.........................................................................................................1
1.2 The Non-Engineering Built Environment.....................................................3
1.3 The Research Problem......................................................................................4
1.4 Significances of the Study...............................................................................5
1.5 Research Question..........................................................................................6
1.6 Objectives of the Study...................................................................................6
1.7 Limitations of the Study................................................................................7
1.8 Structure of the Research Report.................................................................7

CHAPTER TWO: LITERATURE REVIEW

2.1 Definition and Role of the Built Environment.............................................9
2.2 Non- Engineering Built Environment Disciplines.......................................11
   2.2.1 The Architectural Profession.................................................................11
   2.2.2 The Project and Construction Management Profession.....................12
   2.2.3 The Landscape Architectural Profession..............................................16
   2.2.4 The Property Valuation Profession......................................................17
   2.2.5 The Quantity Surveying Profession......................................................18
   2.2.6 The Planning Profession....................................................................19
2.2.7 The Land Surveying Profession .................................. 19

2.3 The Built Environment Training Programmes ................... 21
    2.3.1 The Modus Operandi of Cooperative Education .......... 23

2.4 Challenges Facing the Non-Engineering Built Environment Professionals in South Africa .................................................. 25

2.5 Previous Studies on Skills and Competencies ..................... 29
    2.5.1 A SCANS Report for America (2000) ...................... 29
    2.5.2 The General Perspective on Skill .......................... 32
    2.5.3 The Concept of Core Competency .......................... 36

2.6 Summary ...................................................................... 43

CHAPTER THREE: RESEARCH PROPOSITIONS

3.1 Introduction .................................................................. 44

3.2 Identification of Competencies Required of Non- Engineering Built Environment Professionals in South Africa today .............. 44

3.3 Importance of Education, Training, Work Experience and Organization in Developing Competencies ...................................... 44

3.4 Identification of the Perceived Disparity that Exits between Theoretical and Practical Competencies ............................................. 44

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Research Process .......................................................... 45

4.2 Research Design ........................................................... 45
    4.2.1 Questionnaire Design ............................................ 45
    4.2.2 Pre-test Questionnaire .......................................... 47
    4.2.3 The Population .................................................... 47
    4.2.4 The Research Sample .......................................... 48
4.2.5 Questionnaire Administration..................................................49
4.2.6 Bias......................................................................................50
4.3 Summary..................................................................................50

CHAPTER FIVE: RESULTS AND DISCUSSION

5.1 Response to Questionnaires.......................................................51
   5.1.1 Incomplete and Inappropriate Filling of Questionnaires........51
5.2 The Demographic Profile of Respondents................................52
   5.2.1 The Highest Educational Qualifications.................................52
   5.2.2 Age Range of Respondents..................................................53
   5.2.3 Length of Experience..........................................................54
   5.2.4 Gender..............................................................................55
   5.2.5 Professional Membership Status.........................................55
   5.2.6 Chartered Status...............................................................56
5.3 Work Profile of Respondents.....................................................56
   5.3.1 Present Employment..........................................................56
   5.3.2 Level of Position in Current organization..............................57
5.4 Test of Propositions and Analysis.............................................58
   5.4.1 Proposition 1.....................................................................58
   5.4.2 Proposition 2.....................................................................60
   5.4.3 Proposition 3.....................................................................62
5.5 Analysis of Additional Competencies and Evaluation of a Course
   Identified in the Competency Matrix.............................................68
   5.5.1 Competencies lacking in Formal Education.............................68
   5.5.2 Recommended Postgraduate Specializations........................68
   5.5.3 Roles Expected from Stake Holders.....................................69
   5.5.4 An Overview and Evaluation of an Undergraduate Course......70
CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

6.2 Recommendations

REFERENCES

APPENDICES
GLOSSARY OF TERMS

Competency
Coyne et al (1997) proposes a core competence to be a combination of complementary skills and knowledge bases embedded in a group or team that results in the ability to execute one or more critical processes to a world class standard. Two ideas are especially important here. The skills or knowledge must be complementary, and taken together they should make it possible to provide a superior product.

Built Environment (BE)
The built environment can be described as a complex, techno-socio-economic system comprising physical components (e.g. bridges, roads, ports, rail, schools, healthcare facilities), and the institutional, management and operational relationships among these components and the society they serve (Gueli and Liebenberg, 2006).

Infrastructure
The basic physical and organizational structures and facilities needed for the operation of a nation, society or enterprise. It includes a nation's basic system of transportation, communication, power supplies, housing, sewer and water systems, drainage systems, and essential public utilities (Gueli and Liebenberg, 2006).

Effectiveness
- The degree to which a purpose is achieved.
- Extent to which actual performance compares with targeted performance.
- The power or capacity to produce a desired result.
- Doing the "right" things. (Hornby, 1983).
Efficiency

- The quality or degree to which someone or something possesses adequate skill or knowledge for the performance of a duty.
- In human movements, the relationship between the amount of work done and the energy expended during the work.
- The ratio of the effective or useful output to the total input in any system.
- The ratio of the energy delivered by a machine to the energy supplied for its operation (American Heritage Dictionary, 2000).

Skill

- Proficiency, facility, or dexterity that is acquired or developed through training or experience.
- An art, trade, or technique, particularly one requiring use of the hands or body.
- A developed talent or ability (American Heritage Dictionary, 2000).
LIST OF ABBREVIATIONS

CIOB – Chartered Institute of Builders
NEBE – Non-Engineering Built Environment
NQF - National Qualification Framework
SAQA - South African Qualifications Authority
NSB – National Standard Body
SAIA - South African Institute of Architecture
SAILA - South African Institute of Landscape Architecture
SAICPM - South African Institute of Construction and Project Management
SA IQS - South African Institute of Quantity Surveying
SAIPV - South African Institute of Property Valuation
SAI LS - South African Institute of Land Surveyor
SAIURP - South African Institute of Urban and Regional Planning
RIBA - Royal Institute of British Architects
Wits – University of Witwatersrand, Johannesburg
# LIST OF TABLES

Table 1 – Wits Faculty of Engineering and the Built Environment Syllabus 2007 …… 22
Table 2 - Infrastructure to be constructed by 2009 …………………………………… 26
Table 3 - Core Skills and Knowledge for Built Environment Practitioners …………. 33
Table 4 - Subsidiary Skills and Knowledge for Built Environment Practitioners ….. 33
Table 5 - Proposed table consisting of a brief summary of required competencies for technical professionals and decision-makers……………………………………… 40
Table 6 - Comparative summary of core competencies of some NEBE professions … 42
Table 7 - Chartered Status of respondents…………………………………………… 56
Table 8 - Present employment sector………………………………………………… 57
Table 9 - Level of importance attached to each competency for NEBE professions in South Africa…………………………………………………………………… 59
Table 10 - Current levels of importance of competencies evidenced in NEBE professionals……………………………………………………………………… 60
Table 11 - Contribution of Tertiary, Vocational and CPD training to Competency Development…………………………………………………………………… 61
Table 12 - Contribution of work experiences and organization to competencies development…………………………………………………………………… 62
Table 13 - Evaluation of perceived disparities existing between the level of importance given to theoretical and practical Competencies………………………… 63
Table 14 - Professionalism…………………………………………………………… 64
Table 15 - Planning, Design and Supervision……………………………………….. 65
Table 16 - Solving Problems……………………………………………………… 66
Table 17 - Leadership / Management and Coordination…………………………… 67
Table 18 - Competencies identified as lacking in respondents’ formal education.........68
Table 19 - Suggested postgraduate specializations..............................68
Table 20 - A brief overview of annual assessments of CIVN 1003 course.................71
LIST OF FIGURES

Figure 1 - A graphical representation of the NEBE structure.................................2
Figure 2 - Graphical representation of Council for the Built Environment professions...11
Figure 3 - Categorisation of responses received from NEBE professions..................51
Figure 4 - The Highest educational qualifications achieved by respondents..............52
Figure 5 - Age distribution of respondents..........................................................53
Figure 6 - Graphical representation of respondent’s length of experience...............54
Figure 7 - Professional membership status of respondents...................................55
Figure 8 - Level of respondents’ current position in their organization....................57