MEDIATING EFFECTS OF PERCEIVED USEFULNESS AND TRUST
BETWEEN INDIVIDUAL FACTORS AND INTENTION TO USE E-TRAINING
IN NIGERIAN TECHNOLOGICAL UNIVERSITIES

AHMED UMAR ALKALI

A thesis submitted in fulfilment of the requirements for the award of the degree of
Doctor of Philosophy (Management)

Faculty of Management
Universiti Teknologi Malaysia

OCTOBER 2017
DEDICATION

By the special grace of Allah, I dedicate this thesis to my lovely mother and father, Alhaji Umar Alkali and Hajiya Hauwa’u Alkali.
ACKNOWLEDGEMENT

I would like to express my gratitude and thank all who helped and supported me during my PhD journey.

First of all, I thank the Almighty ALLAH Subhanahu Wata’ala from the core of my heart for guiding and inspiring me. Indeed, all my achievements in life are due to His Special Grace and Mercy. Alhamdulillah.

I wish to acknowledge the unquantifiable, inputs, guidance, and support of my supervisor, Associate Professor Dr. Nur Naha binti Abu Mansoor, towards making this scholarly work a success. My gratitude goes to my lovely wife Adama and my children Abdallah, Nafisah, and Nana Asma for their love and tremendous support throughout my PhD journey. My special appreciation goes to Professor Dr. Aizzat binti Mohd Nasurordin who was my external examiner. I also want to particularly acknowledge the immense contributions of Professor Dr. Khalil bin Md Nor who served as my internal examiner, Sir I am indeed grateful.

I am sincerely thankful to all my relatives, colleagues, and friends for their prayers, best wishes, support, and encouragement. Last but not the least, I am indebted to Modibbo Adama University of Technology, Yola and TETFUND for supporting my PhD program.
ABSTRACT

Developments in information technology (IT) have offered universities some sophisticated technological tools and innovative training contents that can be used in delivering training to their employees. However, for successful IT integration in training, employees’ positive disposition towards the new system is vital. Although factors, including computer/Internet self-efficacy, interactivity, organisational support, perceived usefulness, perceived ease of use and trust have been used in most studies that investigated technology acceptance, little is known about the effects of interactivity and trust on intention to use e-training. Therefore, this study empirically examines the roles of these factors in determining intention to use e-training within the context of Nigerian technological universities using the technology acceptance model (TAM). Data were collected from 301 employees of five technological universities in Nigeria and partial least squares - structural equation modeling (PLS-SEM) was used in the analysis. Findings of the study reveal that interactivity and trust constructs have positively and significantly influenced employees’ intention to use e-training systems. Additionally, perceived usefulness and trust are found to have mediated the relationship between individual factors and intention to use e-training. The Importance-Performance Map Analysis (IPMA) result shows that to predict intention to use e-training in Nigerian technological universities, priorities should be accorded to trust and organisational support. Theoretically, the study has contributed to the understanding of factors affecting intention to use e-training demonstrating the applicability as well as effectiveness of interactivity and trust in predicting intention to use e-training. Methodologically, the study has established the relevance of conducting Importance-Performance Map Analysis (IPMA) in examining intention to use e-training. Practically, the study provides new inputs for successful implementation of e-training systems in universities. It is recommended that future studies investigate the influence of other factors such as subjective norm, enjoyment, and appeal on the intention to use e-training.
ABSTRAK

# TABLE OF CONTENT

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DECLARATION</td>
<td></td>
<td>ii</td>
</tr>
<tr>
<td>DEDICATION</td>
<td></td>
<td>iii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td></td>
<td>iv</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td></td>
<td>v</td>
</tr>
<tr>
<td>ABSTRAK</td>
<td></td>
<td>vi</td>
</tr>
<tr>
<td>TABLE OF CONTENT</td>
<td></td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td></td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td></td>
<td>xvii</td>
</tr>
<tr>
<td>LIST OF ABBREVIATIONS</td>
<td></td>
<td>xix</td>
</tr>
<tr>
<td>LIST OF APPENDICES</td>
<td></td>
<td>xxii</td>
</tr>
</tbody>
</table>

1  INTRODUCTION  1

1.1 Introduction  1
1.2 Research Background  1
1.3 Problem Statement  6
1.4 Research Questions  12
1.5 Research Objectives  12
1.6 Significance of the Study  13
  1.6.1 Knowledge contribution  14
  1.6.2 Practice  15
1.6.2.1 Employees 15
1.6.2.2 University management 15
1.6.2.3 Other Stakeholders 16

1.7 Scope and Limitations of the Study 17
1.7.1 Why Nigerian Technological Universities? 18

1.8 Conceptual and Operational Definition of Terms 19
1.8.1 Individual Factors 19
1.8.2 E-training (ET) 20
1.8.3 Intention (INT) 20
1.8.4 Perceived Usefulness (PU) 20
1.8.5 Perceived Ease of Use (PEOU) 21
1.8.6 Computer/Internet Self-Efficacy (CISE) 21
1.8.7 Interactivity (IR) 21
1.8.8 Organisational Support (OS) 22
1.8.9 Trust (TRS) 22

1.9 Structure of this thesis 22

1.10 Summary 23

2 LITERATURE REVIEW 24

2.1 Introduction 24

2.2 Overview of E-Training 24
2.2.1 Definition of Training 25
2.2.2 Definition of E-training 26
2.2.3 E-training Benefits in Organisations 27

2.3 E-training in Nigerian Universities 29
2.3.1 Challenges of E-training Integration in Nigerian Universities 31

2.4 Studies on Factors Determining Technology Acceptance 34
2.4.1 Commonly Used Factors in Technology Acceptance 36
2.4.2 Not Commonly Used Factors in Technology Acceptance

2.5 Studies on Factors Determining Intention to Use E-Training
2.5.1 Commonly Used Factors in Examining Intention to Use E-training
2.5.2 Not Commonly Used Factors in Examining Intention to use E-training

2.6 Existing Similarities Between E-training and Other Online-Based Systems
2.6.1 Environment
2.6.2 Users
2.6.3 Uncertainties/Risks
2.6.4 Interactivity

2.7 Behavioural Intention

2.8 Underpinning Theory - Technology Acceptance Model (TAM)
2.8.1 Application of the TAM in Studying Intention

2.9 Hypotheses Development
2.9.1 Relationship between Computer/Internet Self-Efficacy and Intention
2.9.2 Relationship between Computer/Internet Self-Efficacy and Perceived Usefulness
2.9.3 Relationship between Computer/Internet Self-Efficacy and Trust
2.9.4 Relationship between Interactivity and Intention
2.9.5 Relationship between Interactivity and Perceived Usefulness
2.9.6 Relationship between Interactivity and Trust
2.9.7 Relationship between Organisational Support and Intention 60
2.9.8 Relationship between Organisational Support and Perceived Usefulness 61
2.9.9 Relationship between Organisational Support and Trust 62
2.9.10 Relationship between Perceived Ease of Use and Intention 62
2.9.11 Relationship between Perceived Ease of Use and Perceived Usefulness 63
2.9.12 Relationship between Perceived Ease of Use and Trust 64
2.9.13 Relationship between Perceived Usefulness and Intention 65
2.9.14 Relationship between Trust and Intention 66
2.9.15 Relationship between Trust and Perceived Usefulness 66
2.9.16 Mediating Role of Perceived Usefulness between Computer/Internet Self-Efficacy and Intention 67
2.9.17 Mediating Role of Perceived Usefulness between Interactivity and Intention 68
2.9.18 Mediating Role of Perceived Usefulness between Organisational Support and Intention 68
2.9.19 Mediating Role of Perceived Usefulness between Perceived Ease of Use and Intention 69
2.9.20 Mediating Role of Trust between Computer/Internet Self-Efficacy and Intention 70
2.9.21 Mediating Role of Trust between Interactivity and Intention 70
2.9.22 Mediating Role of Trust between Organisational Support and Intention 71
2.9.23 Mediating Role of Trust between Perceived Ease of Use and Intention 72
2.9.24 Mediating Role of Perceived Usefulness between Trust and Intention 72

2.10 Conceptual Framework of the Study 76
2.10.1 Independent variables 76
2.10.2 Perceived Usefulness as a Mediator 77
2.10.3 Trust as a Mediator 79
2.10.4 Dependent Variable 81

2.11 Chapter Summary 82

3 RESEARCH METHODOLOGY 83
3.1 Introduction 83
3.2 Research Philosophy 83
3.2.1 Ontological, Epistemological and Methodological Stand of this Research 84
3.3 Research Design 87
3.4 Study Population 89
3.5 Sample Selection 90
3.6 Instrumentation 92
3.7 Pre-Test 97
3.8 Pilot Study 98
3.9 Data Collection 100
3.10 Data Analysis 101
3.10.1 Structural Equation Modeling (SEM) 101
3.10.2 Partial Least Squares Structural Equation Modeling (PLS-SEM) 102
3.10.2.1 Choosing between PLS and CB-SEM 103

3.10.3 The Stages in Data Analysis 105

3.10.3.1 Statistical Methods, Tests, and Software for Data Analysis 106

3.10.3.2 Data Screening 107

3.10.3.3 Biases and Multi collinearity 108

3.10.3.4 Descriptive Analysis 110

3.11 Measurement Model 110

3.11.1 Reflective Measurement Model 110

3.11.1.1 Internal Consistency Reliability 111

3.11.1.2 Indicator Reliability 111

3.11.1.3 Convergent Validity 112

3.11.1.4 Discriminant Validity 113

3.11.2 Assessment of Formative Measurement Model 115

3.11.2.1 Convergent Validity 116

3.11.2.2 Collinearity 117

3.11.2.3 Significance and Relevance of formative construct’s indicators 118

3.12 Structural Model 122

3.12.1 Assessing for collinearity 123

3.12.1.1 Structural Model Relationships 123

3.12.1.2 Assessing the R² 124

3.12.1.3 Effect Size f² 124

3.12.1.4 Predictive Relevance Q² 125

3.12.2 Mediating Effects 126

3.13 Chapter Summary 130

4 DATA ANALYSIS 131

4.1 Introduction 131

4.2 Data Screening 133
4.2.1 Treatment of Missing Values 133
4.2.2 Outliers 134
4.2.3 Normality 136
   4.2.3.1 Skewness and Kurtosis 136
   4.2.3.2 Common Method Bias 137
   4.2.3.3 Multicollinearity 141
4.3 Descriptive Analysis 144
4.4 Research Model Analysis 146
   4.4.1 Analysis of Measurement Model (Reflective) 148
      4.4.1.1 Construct Validity - Convergent and Discriminant Validity 148
      4.4.1.2 Summary of the First-Order Reflective Measurement Model 157
   4.4.2 Formative-Reflective Second-Order Measurement Model 161
      4.4.2.1 Formative construct’s convergent validity 161
      4.4.2.2 Collinearity assessment 162
      4.4.2.3 Assessing the Significance and Relevance of Formative Indicators 164
      4.4.2.4 Summary of the Formative Construct Measurement Model 166
4.5 Assessing the Structural Model 167
   4.5.1 Collinearity Assessment 168
   4.5.2 Assessing Significance of Structural Model Path Coefficients 169
   4.5.3 R Square (R²) 173
   4.5.4 f² - Effect size to R² 175
   4.5.5 Q² - Predictive Relevance 176
   4.5.6 q² – Effect Size of q² 177
4.6 Hypotheses Testing 178
4.7 Mediation 181
4.8 Importance-Performance Map Analysis (IPMA) 184
4.9 Chapter Summary 185

5 DISCUSSIONS AND CONCLUSION 187
5.1 Introduction 187
5.2 Discussions 187
  5.2.1 Research Question 1: 188
  5.2.2 Research Question 2: 191
  5.2.3 Research Question 3: 193
5.3 Knowledge and Practical Implications 195
  5.3.1 Knowledge Implication 196
  5.3.2 Practical Implication 197
  5.3.3 Limitations and Suggestions for Future Research 199
  5.3.4 Conclusion 200
  5.3.5 Chapter Summary 201

REFERENCES 202

Appendices A-O 237-270
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE NO.</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>List of National Technological Universities in Nigeria as at 2015</td>
<td>17</td>
</tr>
<tr>
<td>2.1</td>
<td>Technologies Used in Nigerian Public Universities</td>
<td>30</td>
</tr>
<tr>
<td>2.2</td>
<td>Summary of Challenges of E-training in Nigerian Public Universities</td>
<td>33</td>
</tr>
<tr>
<td>2.3</td>
<td>Summary of Hypotheses</td>
<td>73</td>
</tr>
<tr>
<td>3.1</td>
<td>Population and sample of the study</td>
<td>92</td>
</tr>
<tr>
<td>3.2</td>
<td>Measures of Constructs and Their Sources</td>
<td>95</td>
</tr>
<tr>
<td>3.3</td>
<td>Reliability results for pilot test</td>
<td>100</td>
</tr>
<tr>
<td>3.4</td>
<td>Situations for Using PLS or CB-SEM</td>
<td>103</td>
</tr>
<tr>
<td>3.5</td>
<td>Statistical tests and Methods</td>
<td>107</td>
</tr>
<tr>
<td>3.6</td>
<td>Summary of indices for measurement model analysis using PLS-SEM</td>
<td>115</td>
</tr>
<tr>
<td>3.7</td>
<td>Summary of Guidelines for Assessing Formative Measurement Model</td>
<td>121</td>
</tr>
<tr>
<td>3.8</td>
<td>Indices for Structural Model Analysis using PLS-SEM</td>
<td>129</td>
</tr>
<tr>
<td>4.1</td>
<td>Proposed Stages of Data Analysis</td>
<td>132</td>
</tr>
<tr>
<td>4.2</td>
<td>Summary of Responses</td>
<td>134</td>
</tr>
<tr>
<td>4.3</td>
<td>Identified outliers in the data set</td>
<td>135</td>
</tr>
<tr>
<td>4.4</td>
<td>KMO and Bartlett's Test</td>
<td>138</td>
</tr>
<tr>
<td>4.5</td>
<td>Total Variance Explained</td>
<td>138</td>
</tr>
<tr>
<td>4.6</td>
<td>Nonlinearity Assessment of the Independent Variables</td>
<td>143</td>
</tr>
<tr>
<td>4.7</td>
<td>Respondents Demographics</td>
<td>144</td>
</tr>
<tr>
<td>4.8</td>
<td>Items Loadings</td>
<td>149</td>
</tr>
<tr>
<td>Section</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>4.9</td>
<td>Results of Cronbach’s Alpha, Composite Reliability and AVE</td>
<td>151</td>
</tr>
<tr>
<td>4.10</td>
<td>Items Cross loadings</td>
<td>153</td>
</tr>
<tr>
<td>4.12</td>
<td>HTMT Criterion Results</td>
<td>156</td>
</tr>
<tr>
<td>4.13</td>
<td>First-Order Reflective Measurement Model Results</td>
<td>157</td>
</tr>
<tr>
<td>4.14</td>
<td>Summary of First-Order Measurement Model Results</td>
<td>159</td>
</tr>
<tr>
<td>4.15</td>
<td>Outer VIF values</td>
<td>163</td>
</tr>
<tr>
<td>4.16</td>
<td>Results of the Significance and Relevance of Formative Indicators</td>
<td>165</td>
</tr>
<tr>
<td>4.17</td>
<td>Measurement Properties for Formative Construct</td>
<td>167</td>
</tr>
<tr>
<td>4.18</td>
<td>Collinearity Statistics</td>
<td>169</td>
</tr>
<tr>
<td>4.19</td>
<td>Significance of path coefficients</td>
<td>172</td>
</tr>
<tr>
<td>4.20</td>
<td>R-Square ($R^2$) Values</td>
<td>175</td>
</tr>
<tr>
<td>4.21</td>
<td>Results of the Effect Size ($f^2$).</td>
<td>176</td>
</tr>
<tr>
<td>4.22</td>
<td>Results of $Q^2$</td>
<td>177</td>
</tr>
<tr>
<td>4.23</td>
<td>Results of $q^2$</td>
<td>178</td>
</tr>
<tr>
<td>4.24</td>
<td>Results of Hypotheses Testing</td>
<td>180</td>
</tr>
<tr>
<td>4.25</td>
<td>Mediation Test Results</td>
<td>182</td>
</tr>
<tr>
<td>4.26</td>
<td>Extent of Mediation of Perceived Usefulness and Trust</td>
<td>183</td>
</tr>
<tr>
<td>4.27</td>
<td>Importance-Performance Map Analysis (IPMA) results</td>
<td>185</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE NO.</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Thesis Structure</td>
<td>23</td>
</tr>
<tr>
<td>2.1</td>
<td>Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975)</td>
<td>52</td>
</tr>
<tr>
<td>2.2</td>
<td>Original Technology Acceptance Model (Davis, 1986)</td>
<td>52</td>
</tr>
<tr>
<td>2.3</td>
<td>TAM (Davis et al., 1989)</td>
<td>53</td>
</tr>
<tr>
<td>2.4</td>
<td>Hypotheses of the Study</td>
<td>55</td>
</tr>
<tr>
<td>2.5</td>
<td>Research Framework for This Study</td>
<td>82</td>
</tr>
<tr>
<td>3.1</td>
<td>Categories of Research Paradigms Used in this Thesis</td>
<td>84</td>
</tr>
<tr>
<td>3.2</td>
<td>Research Process of this Study</td>
<td>89</td>
</tr>
<tr>
<td>3.3</td>
<td>Stages Used in Data Analysis</td>
<td>106</td>
</tr>
<tr>
<td>3.4</td>
<td>Deletion and Retaining of Indicators (Hair et al., 2014)</td>
<td>113</td>
</tr>
<tr>
<td>3.5</td>
<td>Redundancy Analysis for Convergent Validity Assessment</td>
<td>116</td>
</tr>
<tr>
<td>3.6</td>
<td>Collinearity Assessment in Formative Measurement Model (Hair et al., 2014)</td>
<td>118</td>
</tr>
<tr>
<td>3.7</td>
<td>Decision-making Process for Keeping or Deleting Formative Indicators (Hair et al., 2014)</td>
<td>120</td>
</tr>
<tr>
<td>3.8</td>
<td>Steps for Assessing the Structural Model Using PLS-SEM (Hair et al., 2014)</td>
<td>122</td>
</tr>
<tr>
<td>3.9</td>
<td>Mediating Effect (Baron and Kenny, 1986)</td>
<td>127</td>
</tr>
<tr>
<td>4.1</td>
<td>Initial Reflective-formative second order hierarchical model</td>
<td>147</td>
</tr>
<tr>
<td>4.2</td>
<td>Final First-order reflective measurement model</td>
<td>160</td>
</tr>
<tr>
<td>4.3</td>
<td>Redundancy Analysis</td>
<td>162</td>
</tr>
<tr>
<td>Section</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>4.4</td>
<td>Reflective-Formative Second-Order Structural Model</td>
<td>168</td>
</tr>
<tr>
<td>4.5</td>
<td>PLS-SEM Algorithm Results of the Structural Model</td>
<td>170</td>
</tr>
<tr>
<td>4.6</td>
<td>Bootstrapping Results of the Structural Model</td>
<td>171</td>
</tr>
<tr>
<td>4.7</td>
<td>R-squares of all Dependent Variables</td>
<td>174</td>
</tr>
<tr>
<td>4.8</td>
<td>Importance-Performance Map</td>
<td>184</td>
</tr>
</tbody>
</table>
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATBU</td>
<td>Abubakar Tafawa Balewa University</td>
</tr>
<tr>
<td>CB-SEM</td>
<td>Covariance-Based Structural Equation Modeling</td>
</tr>
<tr>
<td>CD</td>
<td>Compact Disc</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>Compact Disc, read-only-memory</td>
</tr>
<tr>
<td>CFA</td>
<td>Confirmatory Factor Analysis</td>
</tr>
<tr>
<td>CISE</td>
<td>Computer/Internet Self-Efficacy</td>
</tr>
<tr>
<td>CR</td>
<td>Composite Reliability</td>
</tr>
<tr>
<td>DV</td>
<td>Dependent Variable</td>
</tr>
<tr>
<td>DVD</td>
<td>Digital Versatile Disc or Digital Video Disc</td>
</tr>
<tr>
<td>E-HRM</td>
<td>Electronic Human Resource Management</td>
</tr>
<tr>
<td>ET</td>
<td>E-Training</td>
</tr>
<tr>
<td>ETF</td>
<td>Education Tax Fund</td>
</tr>
<tr>
<td>FMoE</td>
<td>Federal Ministry of Education</td>
</tr>
<tr>
<td>FUTA</td>
<td>Federal University of Technology Akure</td>
</tr>
<tr>
<td>FUTM</td>
<td>Federal University of Technology Minna</td>
</tr>
<tr>
<td>FUTO</td>
<td>Federal University of Technology Owerri</td>
</tr>
<tr>
<td>HRM</td>
<td>Human Resource Management</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
</tr>
<tr>
<td>IMPA</td>
<td>Importance-Performance Matrix Analysis</td>
</tr>
<tr>
<td>INT</td>
<td>Intention</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
</tr>
<tr>
<td>---------</td>
<td>-----------</td>
</tr>
<tr>
<td>IR</td>
<td>Interaction</td>
</tr>
<tr>
<td>IS</td>
<td>Information System</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>KMO</td>
<td>Kaiser-Meyer-Olkin</td>
</tr>
<tr>
<td>LMS</td>
<td>Learning Management System</td>
</tr>
<tr>
<td>MAUTECH</td>
<td>Modibbo Adama University of Technology</td>
</tr>
<tr>
<td>MBA</td>
<td>Master of Business Administration</td>
</tr>
<tr>
<td>MIS</td>
<td>Management Information System</td>
</tr>
<tr>
<td>ML</td>
<td>Maximum Likelihood</td>
</tr>
<tr>
<td>MOOC</td>
<td>Massive open online course</td>
</tr>
<tr>
<td>MV</td>
<td>Mediating Variable</td>
</tr>
<tr>
<td>NITDA</td>
<td>National Information Technology Development Agency</td>
</tr>
<tr>
<td>NUC</td>
<td>National Universities Commission</td>
</tr>
<tr>
<td>OLS</td>
<td>Ordinary Least Squares</td>
</tr>
<tr>
<td>OS</td>
<td>Organisational Support</td>
</tr>
<tr>
<td>PDA</td>
<td>Personal Digital Assistant</td>
</tr>
<tr>
<td>PE</td>
<td>Perceived Enjoyment</td>
</tr>
<tr>
<td>PEOU</td>
<td>Perceived Ease of Use</td>
</tr>
<tr>
<td>PLS</td>
<td>Partial Least Squares</td>
</tr>
<tr>
<td>PLS-SEM</td>
<td>Partial Least Squares Structural Equation Modeling</td>
</tr>
<tr>
<td>PU</td>
<td>Perceived Usefulness</td>
</tr>
<tr>
<td>SEM</td>
<td>Structural Equation Modeling</td>
</tr>
<tr>
<td>SL</td>
<td>Second Life</td>
</tr>
<tr>
<td>SN</td>
<td>Subjective Norm</td>
</tr>
<tr>
<td>TAM</td>
<td>Technology Acceptance Model</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>TETFUND</td>
<td>Tertiary Education Trust Fund</td>
</tr>
<tr>
<td>TPB</td>
<td>Theory of Planned Behaviour</td>
</tr>
<tr>
<td>TRA</td>
<td>Theory of Reason Action</td>
</tr>
<tr>
<td>TRA</td>
<td>Theory of Reason Action</td>
</tr>
<tr>
<td>TRS</td>
<td>Trust</td>
</tr>
<tr>
<td>UTAUT</td>
<td>Unified Theory of Acceptance of the Use of Technology</td>
</tr>
<tr>
<td>VIF</td>
<td>Variance Inflation Factors</td>
</tr>
<tr>
<td>VLE</td>
<td>Virtual Learning Environment</td>
</tr>
</tbody>
</table>
# LIST OF APPENDICES

<table>
<thead>
<tr>
<th>APPENDIX</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Technology Acceptance Factors</td>
<td>237</td>
</tr>
<tr>
<td>B</td>
<td>Intention to Use E-training Factors</td>
<td>246</td>
</tr>
<tr>
<td>C</td>
<td>Krejcie and Morgan Sampling Table</td>
<td>251</td>
</tr>
<tr>
<td>D</td>
<td>Research Questionnaire</td>
<td>252</td>
</tr>
<tr>
<td>E</td>
<td>Results of Skewness and Kurtosis</td>
<td>257</td>
</tr>
<tr>
<td>F</td>
<td>KMO and Bartlett’s Test</td>
<td>259</td>
</tr>
<tr>
<td>G</td>
<td>Total Variance Explained</td>
<td>260</td>
</tr>
<tr>
<td>H</td>
<td>Scree Plot</td>
<td>261</td>
</tr>
<tr>
<td>I</td>
<td>Rotated Component Matrix</td>
<td>262</td>
</tr>
<tr>
<td>J</td>
<td>Initial Items Loadings</td>
<td>263</td>
</tr>
<tr>
<td>K</td>
<td>HTMT Inference Confidence Level</td>
<td>265</td>
</tr>
<tr>
<td>L</td>
<td>HTMT Inference Results</td>
<td>267</td>
</tr>
<tr>
<td>M</td>
<td>Formative Items Outer Loadings</td>
<td>268</td>
</tr>
<tr>
<td>N</td>
<td>Outer Weight of Formative Construct</td>
<td>269</td>
</tr>
<tr>
<td>O</td>
<td>List of Publications</td>
<td>270</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

1.1 Introduction

The goal of this study is to determine the mediating effects of perceived usefulness and trust in the relationship between individual factors and intention to use e-training system in Nigerian technological universities. This chapter therefore, unveils the outline of this research. In particular, it provides a broad description of the research background, the problem of the study, research questions and objectives, scope and limitations, and the significance of the study.

1.2 Research Background

Putting in place a competent workforce is the desire of every modern organisation. In today’s knowledge based economy, the influence of an organisation’s human resource cannot be overemphasised as its success largely hinges on the performance of its human resource management (HRM) (Masum et al., 2015). To have competitive advantage and comply with the demands of the emerging global labour market infrastructure, organisations must create a mechanism that ensures the availability of a workforce with the prerequisite knowledge, skills, and ability to
effectively deliver within the existing constraints of global competition. According to Koontz and Weihrich (2006), this can be achieved through the provision of extensive training that provides employees with enhanced knowledge of the new socio-economic and technological changes in the contemporary world of competition.

Previous studies have demonstrated the positive effects of training on quality of workers knowledge, skills, capability, and higher employee job performance (Guest, 1997). Likewise, training was established to have improved employees’ productivity, compensation, and eagerness to work, while it also helps organisations to increase productivity (Dermol and Čater, 2013). Training has also been associated with improving employees skills which has led to job satisfaction (Arslan and Uzaslan, 2017). However, the traditional face to face method of delivering training has been criticised by some researchers as being inflexible (Thelen et al., 2011) and expensive, considering the costs incur for training venue, tuition, travel, meals and materials (Bajracharya, 2017). The existence of these weaknesses has led to the demand for other alternative training methods. This saw many organisations adopting web-based forms of learning to provide employee training (Kamal et al. (2016).

It is noteworthy to state here that developments in information and communication technology (ICT) have provided organisations with some sophisticated technological tools and innovative training contents that can be used in delivering training to employees. This concept is known as ‘e-training’. E-training refers to the training provided by organisations to their employees using the Internet/Intranet, computers, recorded past trainings on CD-ROM or flash drive, and other electronic media to improve their knowledge and skills for better performance. Indicating the increase in the use of e-training, a study has reported that in past decade, organisations have regularly used technology in delivering training programs to employees (Ozturan and Kutlu, 2010). The rise could be attributed to the benefits organisations drive from its use. For instance, Strother (2002) has reported that Rockwell Collins brought down its total training costs by 40% through the conversion of just 25% of its training contents and making it accessible online. Other reported
outcomes of e-training include knowledge development, job satisfaction, and work performance (Byun and Mills, 2011).

Others researchers have reported saving costs, flexibility in training delivery, employee self-paced learning, and availability of lifelong use of training resources within the company as benefits of e-training (Chao and Chen, 2009; Zainab et al., 2015; Amara and Atia, 2016). Meanwhile, e-training is not without weaknesses. The inherent weaknesses of e-training include lack of physical human interaction, eye contact, and the difficulty of some forms of training to be replaced by information technology (IT) (Singh and Singh, 2015). However, in spite of these weaknesses, there is an increasing organisational demand for web-based forms of learning to provide employee training (Kamal et al. 2016).

Nigerian technological universities are key for social, economic, and technological development of the country. Operating in today’s knowledge based economy, where education is no longer constrained by boundaries, a competent, highly skillful, and experienced workforce becomes indispensable to these universities. However, despite the huge budgetary allocations these universities enjoyed in the past, they are still battling with large staff that are usually redundant, ageing, untrained, and working in a poorly provided infrastructure (El-Rufai, 2011). This could be responsible for the weakening level of job performance among employees of these universities in Nigeria (Ogbulafor, 2011). The existence of these problems affect the efficiency of the universities employees which will require new thinking and approach to solve.

As earlier pointed out, providing extensive and timely training will enhance the competence of the university employees. However, with low funding, the universities are in a state that will make sustaining the present traditional face to face form of training with large number of employees that need training, coupled with differing work schedules in the universities (Umeagukwu and Ngozi, 2014; Ahmad et al., 2014), remains a serious challenge that must to be overcome by the Nigerian technological universities. Among the existing weaknesses of the traditional face to
face method of training used in these universities is that once an initial training is completed, employees would have limited access to the trainer, and will individually have to keep training documents in case there is need to refer to the training contents. On the alternative, the employees could opt to ask other colleagues questions when uncertain, which could lead to inconsistencies in jobs especially when the staff consulted failed to provide the correct answers.

Moreover, the university employees do have diverse responsibilities, such as teaching, supervision, customer service, information technology support (IT), safety and security, accounts and audit, and student management to discharge daily. Providing training to employees in these job categories could be very difficult and costly especially when using the traditional training method. Could the integration of e-training be necessary and timely to Nigerian technological universities, especially in the face of their present challenges?

If the universities are to address the above-mentioned training related problems through technology integration in their training activities, the universities will have to contain with the existing constraints which may affect successful integration of e-training. Presently, there are challenges that can affect successful implementation of e-training in Nigerian technological universities. Some of these challenges are organisational in nature while others are individual. The organisational challenges include low funding from the government (Nwogo, 2009; Umeagukwu and Ngozi, 2014), inadequate ICT facilities (Baro and Zuokemefà, 2011; Aworanti, 2016), lack of technical staff to handle ICT training and maintenance (Umeagukwu and Ngozi, 2014; Nwezeh, 2010a), unstable electricity supply and low Internet connectivity (Onuka and Durowoju, 2012; Agbetuyi and Oluwatayo, 2012; Adomi, 2005). Unstable electricity and Internet connectivity have made the available ICT facilities in the universities to be dysfunctional (Aduke, 2008).

There are also challenges that are related to employees in these universities. They include low ICT knowledge, skills, and motivation to use technology in teaching and other work activities (Umeagukwu and Ngozi, 2014; Ajadi et al., 2008). Likewise,
technophobia among employees, lack of awareness and interest in ICT use, and lack of intention to learn how to use ICT were identified as factors affecting technology use in the work activities of employees in Nigerian universities (Nkechinyere, 2011; Baro and Zuokemefa, 2011; Aworanti, 2016; Nwezeh, 2010b; Ahmad et al., 2014; Jegede, 2009; Archibong et al., 2010; Folorunso et al., 2006).

Given the fact that e-training is provided through the means of technology, the dual effects of these challenges could affect the ability of the technological universities to deploy the necessary technologies and other resources required for its successful implementation. Specifically, these challenges may also have consequences on employees’ ability to use e-training systems in the universities. Since employees remain the major target of every training program of these universities and central to the implementation, use, and success of e-training, understanding what will hinder them from using e-training or create positive behavioural intention to use the system among the employees also becomes indispensable for the technological universities.

According to Ajzen (1991), behavioural intention involves motivational factors that influence behaviour. These factors indicate how hard people are planning to try and how much effort they are planning to exert in order to perform the behaviour. The essence of investigating employees’ intention to use e-training in Nigerian technological universities is to be able to understand and explain the important factors influencing behavioural intention towards its usage. Also, such investigation may likely expose the potential areas of employee weaknesses that can hamper use intention so that they can be remedied to ensure all-inclusive e-training acceptance and use. By so doing, the universities can utilise and maximally benefit from using e-training system and thus, meet their training needs within their present constraints. However, at present it is unclear what factors will be most relevant in determining employees’ intention to use e-training within the context of Nigerian technological universities.
1.3 Problem Statement

Implementing successful e-training systems in Nigerian technological universities will require strong commitment of the universities in providing the necessary resources for their deployment and other support for employee to adequately use the systems. The ability of the employees and their willingness to accept and adequately utilise and contribute to successful implementation of e-training in the universities is critical. Even though, e-training use in the universities will be mandatory for all employees, there is still the need to examine the factors that will explain why employees intend to use the system or not. In the past, employees have used their labour unions to avoid the implementation of policies and programmes such as e-payment (Ayoola, 2013). Likewise, there are still reported cases of university employees evading the use of technology and prefer the normal way of teaching, supervision, and other administrative activities than using technology (Ahmad et al., 2014). Therefore, one way of ensuring the cooperation of employees in the successful implementing e-training, is to examine and ascertain the factors that will best explain their behavioural intention towards using e-training systems prior to their implementation in these universities. However, no study has provided empirical evidences on the specific factors affecting employees’ intention to use e-training within the context of Nigerian technological universities. Meanwhile, there are well documented evidences on factors affecting technology acceptance.

User technology acceptance has been extensively investigated and reported in the extant literature and these investigations have cut across different fields of study, technologies, and contexts. Among the areas these studies were conducted include; learning management systems (LMS) (Baleghi-Zadeh et al., 2017), e-commerce (Awa et al., 2015), mobile education information system (Koç et al., 2016), e-learning system (Al-Gahtani, 2014), e-government (Hamid et al., 2016), electronic banking (Md Nor and Pearson, 2007); teleconferencing (Park et al., 2014), mobile value added services (Kuo and Yen, 2009), cloud computing (Sharma et al., 2016), computers (Teo et al., 2016), websites (Pengnate and Sarathy, 2017), and social networking sites (Choi
and Chung, 2013). These studies and many others have reported some diverse important factors as determinants of individual’s intention to use technology.

These factors include the two main constructs of the TAM model, that is, perceived ease of use and perceived usefulness (Baleghi-Zadeh et al., 2017; Mou et al., 2017; Chen et al., 2007b; Wang et al., 2017; Cigdem and Topcu, 2015), computer/Internet self-efficacy (Abdullah et al., 2016; Cheung and Vogel, 2013; Park et al., 2014), trust (Ahmed et al., 2015; Md Nor and Pearson, 2007; Tsai et al., 2011), interactivity (Qutaishat, 2012; Jeon et al., 2017; Lee et al., 2015b), organisational support (Zainab et al., 2015; Al-alak and Alnawas, 2011), attitude (Ortega Egea and Román González, 2011; Dlalisa, 2017; Bakhsh et al., 2017), enjoyment (Tan and Leby Lau, 2016; Wu and Chang, 2005), and subjective norm (Mou et al., 2017; Cigdem and Topcu, 2015; Shum et al., 2009). Others include security (Qutaishat, 2012), image (Phatthana and Mat, 2011), appeal (Pengnate and Sarathy, 2017), playfulness (Wu and Chang, 2005; Pai and Yeh, 2014; Ifinedo, 2017), compatibility (Chen and Hsiao, 2012; Lai, 2017), perceived fit (Wu et al., 2008), service quality (Tan and Leby Lau, 2016), job opportunity (Sharma et al., 2016), perceived risk (Pavlou, 2003; Ortega Egea and Román González, 2011), and satisfaction (Maria Correia Loureiro et al., 2014). It should be noted however, that perceived usefulness, perceived ease of use, computer/Internet self-efficacy, interactivity, organisational support, and trust were reported by majority of the studies reviewed (see Appendix A).

In the case of e-training, researchers have also investigated the factors that influence employee’s intention to use e-training. Review of the literature in the area has revealed some important factors have been established as determinants of intention to use e-training. These factors include perceived ease of use (Halim et al., 2016; Ham et al., 2008; Masa’d, 2017) and perceived usefulness (Makgato and Bankole, 2016; Cheng, 2011; Hashim, 2008), computer/Internet self-efficacy (Mooghali and Mirghaderi, 2012; Hester et al., 2016; Zainab et al., 2017) and organisational support (Chatzoglou et al., 2009; Effendi, 2014; Henneke and Matthee, 2012). These four factors were the most mentioned as determinants of individual’s intention to use e-training and are tested in the current study. Others include performance expectancy
(Shaqrah and Husain, 2014), effort expectancy (Alrawashdeh and Al-Mahadeen, 2013), computer anxiety (Hester et al., 2016; Yoo et al., 2012), social influence (Hester et al., 2016; Alrawashdeh and Al-Mahadeen, 2013), enjoyment (Yoo et al., 2012), access (Hassan, 2011), privacy (Huang et al., 2015), and motivation (Henneke and Matthee, 2012) (see Appendix B).

The researcher’s review of the extant literature has shown that investigations into the factors affecting intention to use e-training systems are not as extensive and wide when compared to factors determining technology acceptance. This has confirmed earlier claims by researchers that empirical evidences on factors affecting intention to use e-training are limited in the literature (Ahmed, 2015; Batalla-Busquets and Martínez-Argüelles, 2014; de Melo Pereira et al., 2015). This also goes further to suggest that factors influencing intention to use e-training, that is, computer/Internet self-efficacy, perceived usefulness, perceived ease of use, and organisational support can be expanded by considering other factors. This can be done by borrowing from existing factors established to have influenced intention to use technology especially those relating to e-learning, e-commerce, and e-government.

Several similarities exist between the environments of these systems and that of e-training. The most important similarity is that they all use technology and their services are provided online. Previous studies have confirmed the technological similarity among these systems. For instance, it was reported that providing e-training will require the use of technology which is mediated by Internet (Mohsin and Sulaiman, 2013). Similarly, e-commerce is facilitated by ICT tools such as the Internet, the World Wide Web (WWW), wireless mobile phones, telefax and computers, among other tools (Migiro, 2006). Likewise, it was reported that e-learning requires technology infrastructure like computers, broadband Internet connection (Oreški and Savić, 2013). Also, it was opined that e-government requires the use of web-enabled computer technologies (Evans and Yen, 2006). Now, since the services of these systems require technology to be offered, it also goes further to suggest that users of these systems are expected to possess the basic knowledge, skills, and confidence of using a computer/Internet.
Another similarity is that the environments of these system contain some elements of uncertainty/risk which are common with most information technologies and online platforms (Yee-Loong Chong et al., 2010). According to Horst et al. (2007), users must trust the infrastructure through which online transactions are performed. Previous studies have reported the existence of risks relating to security of personal information and privacy, in e-commerce, e-government, and in e-learning platforms. For example, it was established that about 75% of consumers worry about security and transaction risks when using mobile payment (Lu et al., 2011; Juan et al., 2009). Similarly, Sarabdeen et al. (2014) have reported that security and privacy are important issues users of e-government consider. In the case of e-learning, Merete Hagen and Albrechtsen (2009) have demonstrated the existence of security and risk issues relating to employee information. The issues relating to privacy and security could also be applicable to e-training environment. Therefore, it is expected that employees of these universities may want to use e-training systems only when they feel it is secured, trustworthy, and can serve their specific needs.

Furthermore, there are also similarities among e-training, e-commerce, e-learning, and e-government systems in terms of how their users interact on their platforms. These systems are expected be interactive in nature in order to enable the users get information, send messages, make queries, and get instant responses. Previous studies have demonstrated that interaction is important in e-learning (Kuo et al., 2013), between e-tailers and customers in e-commerce (Merete Hagen and Albrechtsen, 2009), and necessary for promoting not only online engagement of citizens and public servants, but also offline engagement in e-government (Meskell, 2007). Under e-training, interactions among employees and other participants will also be necessary and important as there is absence of face to face contact during training.

Considering the above similarities among these systems, it will make more sense to incorporate interactivity and trust factors among the determinants of intention to use e-training. Since under e-training, face to face contact is eliminated, and the fact that the employees of Nigerian technological universities are used to the traditional face to face training, it is expected that the ability of their employees to communicate,
send messages and get instant response, could cushion the effects of lack of face to face contact under e-training environment and lead to positive perceptions of its interactivity which will affect intention towards e-training use. Likewise, due to the existence of risks relating to privacy and security in online environment as earlier discussed, employees of these universities may likely exercise some reservations regarding e-training use. Already, there are reported cases of employees evading the use of technology in teaching, supervision, and other work activities due to technophobia (Ahmad et al., 2014), inadequate ICT use knowledge and skills (Igbineweka and Ahmed, 2014) and the fear that technology use will make them lose their jobs (Omeire and Omeire, 2014). In line with this, it is expected that the employees will only want to use e-training when they perceive that e-training system will function well, be reliable, secured, trustworthy, and of benefits to them. Since interactivity and trust constructs have mostly been applied to investigate intention to use e-commerce, e-learning, and e-government, their inclusion to examine intention to use e-training will enhance the present understandings on factors influencing e-training intention and therefore add to new knowledge as these factors have not been examined in e-training yet.

Similarly, the researcher also expects that computer/Internet self-efficacy, perceived usefulness, perceived ease of use, and organisational support will be suitable and relevant in examining intention to use e-training in Nigerian technological universities. These factors as earlier discussed, have been mentioned in the majority of the studies that investigated technology acceptance and those that examined intention to use e-training as strong predictors of intention.

Several theories and models exist in the extant literature that are used in providing explanation on individual’s adoption or acceptance of technology. These include among others the Innovation Diffusion Theory, Theory Reasoned Action (TRA), Theory of Planned Behaviour (TPB), the Technology Acceptance Model (TAM), the Unified Theory of Acceptance of the Use of Technology (UTAUT), etc. However, among the various theories and models used in explaining technology use intention, the TAM by Davis (1989) is the most popular and most applied among
researchers (Chau, 1996). Review of the extant literature by the researcher has also confirmed that TAM has been the most widely used among past and recent studies on intention to use technology. According to TAM, user perceptions of usefulness (PU) and ease of use (PEOU) determine user’s attitudes toward the system and user’s attitudes toward using the system determines his/her behavioural intentions, which subsequently lead to the actual system use of the system. Perceived usefulness has been defined as the extent to which an individual believes that using a particular system would enhance his/her job performance, while perceived ease of use is the extent to which an individual believes that using a particular system would be free of physical and mental effort (Davis, 1989). According to Davis (1989), the chronological relationship of belief to attitude to intention to behaviour in TAM, allows researchers to predict usage of new technologies by users.

Venkatesh and Bala (2008), have reported that many studies have used TAM its applicability and explanatory power in the extant literature relating to technology acceptance and adoption. Another reason advanced for its acceptance among researchers is the degree of its flexibility, which can be modified, based on the purposes of the study, enabling it to be extended (Šumak et al., 2011). Hence, many research were conducted to ascertain the effectiveness of TAM in predicting diverse technologies in which researchers include external variables in order to improve its overall predictive validity (Marangunić and Granić, 2015). Previous studies have applied the TAM and found it to be very effective in providing explanation on why users reject or accept particular technologies (Eke, 2011; Krishanan et al., 2016; Abdullah et al., 2016; Lee et al., 2015b; Masa'd, 2017).

This study used the TAM model as underlying model/theory in explaining why the employees of Nigerian technological universities want to use e-training systems. The traditional relationships of the TAM model were used and additional external factors of computer/Internet self-efficacy, interactivity, organisational support, and trust were incorporated into the model. Perceived usefulness and trust are used as mediators in the present study. Perceived usefulness has been used to mediate the relationships between perceived ease of use, computer/Internet self-efficacy,
interactivity, organisational support, and trust and intention on individual basis. Next section presents the research questions and objectives the study will attempt to answer and achieve respectively.

1.4 Research Questions

Based on the stated problems above, and the gap identified in the extant literature, the following questions were set to be answered by this study:

III. What are the relationships between the individual factors (computer/Internet self-efficacy, interactivity, organisational support, and perceived ease of use), perceived usefulness, trust and employees’ intention to use e-training in Nigerian technological universities?

IV. Does perceived usefulness mediate the relationship between individual factors and intention to use e-training in Nigerian technological universities?

V. Does trust mediate the relationship between individual factors and intention to use e-training in Nigerian technological universities?

1.5 Research Objectives

The aim of the study was to determine the mediating effects of perceived usefulness and trust between individual factors and intention to use e-training in Nigerian technological universities. Specifically, the study was set to achieve the following objectives:
I. To determine whether relationships exist between these individual factors (computer/Internet self-efficacy, interactivity, organisational support, and perceived ease of use), perceived usefulness, trust and employees’ intention to use e-training in Nigerian technological universities.

II. To determine if perceived usefulness mediates the influence of individual factors on intention to use e-training in Nigerian technological universities.

III. To determine if trust mediates the influence of individual factors on intention to use e-training in Nigerian technological universities.

1.6 Significance of the Study

Nigerian technological universities were established to provide human capital development by producing scientists and engineers with requisite entrepreneurial and leadership skills, and to facilitate scientific and technological knowledge development, incubation and dissemination through collaborative research and establishing linkages with industries locally and globally (Hayden et al., 1992). To achieve these objectives, the universities are required to have a functional and competent workforce who will carry out the various activities of teaching, supervision, research, and others. However, these universities face the problems of weakening employee performance (Ogbulafor, 2011) and low funding (Umeagukwu and Ngozi, 2014; Aworanti, 2016). Previously, employees’ performance was reported to have been influenced by training (Dermol and Čater, 2013). However, with low funding, these universities may find it challenging to sustain the traditional face-to-face training method having been established to be expensive (Bajracharya, 2017). Thus, the universities as a matter of urgency need to seek for alternative strategies for providing training to their diverse and large staff base.
Meanwhile, technological developments have made it possible for these universities to provide e-training which is that is flexible (Chao and Chen, 2009), that provides virtual reality and that is cost-effective (Amara and Atia, 2016). The fact that e-training is highly dependent on technology in order to be delivered, caution must be exercised by the universities regarding to its implementation. A part form the need to put in place necessary technologies required for e-training systems use, the employees, whom the training is meant for should be in the position to adequately utilise it. Therefore, the findings of this study will provide information that will offer adequate explanation and understanding of the important factors to be considered prior to implementing e-training. Specifically, this study is of significance to the following.

1.6.1 Knowledge contribution

It is expected that the findings of this scholarly work have filled the gaps existing in the extant literature on factors influencing intention to use e-training by providing empirical evidences on the factors determining intention to use e-training in Nigerian technological universities. Conducting empirical study to examine the factors influencing intention to use e-training has not only filled the gaps in the literature on factors determining intention to use e-training which was reported as inadequate (Fallery et al., 2010; Zainab et al., 2015), but has also provided more insights into the factors explaining employees’ behavioural intention towards using e-training within context of Nigerian technological universities. Also, the findings could be relevant to other universities within Nigeria and other African countries considering their nature and cultural similarity. In addition, to the four common factors examined in e-training, that is, computer/Internet self-efficacy, perceived usefulness, perceived ease of use, and organisational support, by incorporating the external constructs of interactivity and trust into the technology acceptance model, the study, as expected has improved the overall predictiveness of the model. Furthermore, the study also demonstrated the applicability and predictive validity of the TAM in investigating intention to use e-training in Nigerian context. Moreover, the study revealed areas of intention to use e-training that will require further investigations by researchers.
As expected, the findings of this scholarly work will have impact on e-training practice in the following ways:

1.6.2.1 Employees

Examining the factors influencing intention to use e-training will reveal how employees intend to use e-training and the factors explaining their behavioural intention. Knowing the important factors affecting employees’ intention to use e-training will enable the universities’ management to strengthen them and improve on areas of weaknesses. For instance, even those employees with high computer/Internet self-efficacy and experience in online learning may still require some training and support when it comes to the use of e-training tools and platforms. Providing special training to improve employees’ knowledge, skills, and ability will further improve their capacity to use e-training which will lead to its successful implementation. Successful e-training implementation in the universities will in turn provide the employees with flexible training (Amara and Atia, 2016) that will lead to knowledge development, job satisfaction, and improve work performance (Byun and Mills, 2011).

1.6.2.2 University management

Knowing the factors that will facilitate or deter successful implementation of e-training in the technological universities will be useful to the university management. In other words, by explaining employees’ behavioural intention to use e-training in the universities, this study will would assist the management of the universities with inputs for planning and decision-making which normally precedes technology integration and drives successful implementation (Jhurree, 2005). For example, findings of this scholarly work have provided some explanation on how employees in Nigerian technological universities arrived at their decision to use e-
training. The findings may further be a reference point for strengthening technology integration in the activities of the universities and for other university management. The findings of the study are also expected to be valuable to management in making decisions in respect of choosing a particular e-training system that will best suit the specific needs of their employees.

With challenges relating to low employee performance and funding, any information that will aid speedy and successful implementation of e-training would be highly appreciated by the management of these universities because it will be timely and very crucial. Successful implementation of e-training will enable the universities to benefit from saving costs relating to employees’ travel time and expenditures, flexibility in training delivery, and availability of lifelong use of training resources within the company (Chao and Chen, 2009; Zainab et al., 2015; Amara and Atia, 2016). This will in turn enable the universities develop the knowledge and skills of their employees, and improve job performance (Byun and Mills, 2011; Mohammadyari and Singh, 2015).

1.6.2.3 Other Stakeholders

The Federal Ministry of Education (FMoE) and National Universities Commission (NUC) may find the findings of the study useful for formulation of policies and other regulations for comprehensive continuing professional development of employees in not only technological universities but other public universities as well. Similarly, the findings of the present study may help policy makers to understand the identified areas of e-training that will require priority in the design and implementation in universities. Likewise, developers of training materials, software, and hardware providers will find the findings of this study useful in tailoring their e-training products and related services to universities.
1.7 Scope and Limitations of the Study

There are a total of 43 federal universities spread all over Nigeria (NUC, 2015). Considering the number of these universities, it will be practically impossible for the researcher to cover all in this scholarly work. Since the present study is interested in technology integration, particularly, factors determining intention to use e-training in national public universities, the researcher deemed it suitable to focus on the technological universities among them. In the forty-three universities, five are technological universities and they include Abubakar Tafawa Balewa University (ATBU), Federal Universities of Technology, Akure (FUTA), Federal Universities of Technology, Minna (FUTM), Federal Universities of Technology, Owerri (FUTO), and Modibbo Adama University of Technology, Yola (MAUTECH). Summary of these universities including date established, region, and ownership is provided in Table 1.1. The respondents of the study include both academic and non-academic staff of the five universities as they all require training to improve their knowledge and skills for effective job performance.

Table 1.1: List of National Technological Universities in Nigeria as at 2015

<table>
<thead>
<tr>
<th>S/N</th>
<th>Name</th>
<th>Region</th>
<th>Ownership</th>
<th>Year Founded</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abubakar Tafawa Balewa University, Bauchi (ATBU)</td>
<td>Northeast</td>
<td>Federal</td>
<td>1988</td>
</tr>
<tr>
<td>2</td>
<td>Federal University of Technology, Akure (FUTA)</td>
<td>Southwest</td>
<td>Federal</td>
<td>1981</td>
</tr>
<tr>
<td>3</td>
<td>Federal University of Technology, Minna (FUTM)</td>
<td>North central</td>
<td>Federal</td>
<td>1982</td>
</tr>
<tr>
<td>4</td>
<td>Federal University of Technology, Owerri (FUTO)</td>
<td>Southeast</td>
<td>Federal</td>
<td>1980</td>
</tr>
<tr>
<td>5</td>
<td>Modibbo Adama University of Technology, Yola (MAUTECH)</td>
<td>Northeast</td>
<td>Federal</td>
<td>1988</td>
</tr>
</tbody>
</table>

Source: National Universities Commission list of Nigerian universities and year founded (NUC, 2015)
1.7.1 Why Nigerian Technological Universities?

Generally, Nigerian technological universities were established to facilitate new knowledge creation, innovation and technologies for socio-economic development of the country, empowering its citizens, and national integration (Olutola and Olatoye, 2015). According to Hayden et al. (1992), the technological universities in Nigeria are to provide the needed human capital development by producing scientists and engineers with requisite entrepreneurial and leadership skills, and to facilitate scientific and technological knowledge development, incubation and dissemination through collaborative research and establishing linkages with industries locally and globally. To achieve these noble goals, the universities need to attract and hire the most qualified hands in terms of knowledge, skills, and ability to effectively carry out various academic and administrative functions. Likewise, to keep and get the best of their employees, the universities should provide continuous training to improve their competence. As technological universities, they are better positioned and most suitable to use technology in providing training to their employees than other public universities in Nigeria.

From their background, as captured in their objectives above, the Nigerian technological universities should not only be leading in scientific and technological development, but also in their practical applications. In this sense, integrating technology in training employees could set pace for other universities to follow. Also, being funded and assisted by the Federal Government, these universities have fair ICT facilities, and support needed to lead in providing solution to the identified problems of university education through technology (Olutola and Olatoye, 2015). This may include using e-training as compared to other universities who are lagging behind when it comes to technology integration in their activities due to inadequacy of basic ICTs and related skills (Lawal et al., 2014; Oye et al., 2011).

Similarly, these universities are anticipated to have employees (both academic and non-academic) that are professionally inclined towards science and technology and with the basic ICT skills and technical knowledge who are likely to be disposed
towards e-training acceptance and use. In addition, these universities have a national spread from the north, south, west and eastern parts of Nigeria (see Table 1.1 above). This makes them a good sample to study, given their peculiarities in terms of education, knowledge, culture, geography, which could have some impacts on the universities, their employees and perceptions on e-training implementation. Therefore, the above stated reasons, in addition to the researcher’s personal experience in technological university as an employee justify the selection of national technological universities in Nigeria for this scholarly work. Next is the conceptual and operational definition of the important terms used in this study.

1.8 Conceptual and Operational Definition of Terms

This part of the chapter provides the conceptual and operational meanings of the terms used in this study. They include the following:

1.8.1 Individual Factors

Individual factors in this study refer to those factors relating to employee’s capacity, knowledge and skill, motivation, and beliefs that affect employee’s disposition towards using e-training system in Nigerian technological universities. For the present study, individual factors include; computer/Internet self-efficacy, perceived ease of use, interactivity, and organisational support. These factors were arrived at after reviewing literature on the factors influencing technology acceptance and those on intention to use e-training. They were mentioned in most studies as strong determinants of intention to use technology. The researcher expected that these factors will be suitable for examining intention to use e-training in the context of this study.
1.8.2 E-training (ET)

Mohsin and Sulaiman (2013), defined e-training as the process of delivering skills and knowledge with the use of technology that is being mediated by Internet from an instructor to employee. In the present study, e-training refers to e-training as the type of training provided by organizations to their employees through the Internet/Intranet/Web, computers, recorded past trainings on CD-ROM or flash drive, and other electronic media with a view to improve their knowledge and skills for better performance.

1.8.3 Intention (INT)

Intention to use refers to the degree to which the participants have formulated plans to perform or not perform a specified behavior in the future (Venkatesh et al., 2003). In the context of this study, intention to use e-training is defined as the extent at which the employees of the public universities in Nigeria intend to use e-training system.

1.8.4 Perceived Usefulness (PU)

Perceived usefulness has been defined as the degree to which a person believes that using a particular system would enhance his/her job performance (Davis et al., 1989). Perceived usefulness in this study refers to the degree to which an employee believes that using e-training would enhance his/her skills, task accomplishment, productivity, and make work easy and useful.
1.8.5 Perceived Ease of Use (PEOU)

According to Davis et al. (1989), perceived ease of use is the degree to which a person believes that using a particular system would be free of physical and mental effort. In the present study, perceived ease of use refers to the degree to which an employee believes that using e-training system will be easy to operate, understandable and flexible.

1.8.6 Computer/Internet Self-Efficacy (CISE)

According to Compeau and Higgins (1995), computer self-efficacy refers to an individual’s judgment regarding his/her ability to use a computer while Internet self-efficacy refers to the individuals belief regarding his/her capacity to utilise the Internet (Hsu and Chiu, 2004). In this study, computer/Internet self-efficacy mean the extent to which an employee possesses the knowledge, skills, and confidence to perform the basic functions of computer applications like MS Word, Excel, and capacity to use the Internet.

1.8.7 Interactivity (IR)

According to Liu and Shrum (2002), interactivity refers to the degree to which two or more communication parties can act on each other, on the communication medium, and on the messages and the degree to which such influences as synchronized. This study adapted this definition and defined interactivity as the degree to which two or more parties communicating in an e-training environment can act on each other, on the communication medium, and on the messages, and the degree to which such influences are synchronized.
1.8.8 Organisational Support (OS)

Organisational support has been defined as the extent to which top and middle management allocate adequate resources to help employees achieve organisational goals (e.g. top and middle management encouragement, technical support facilities (Lee et al., 2013). In the present study, organisational support is seen from the individual level instead of organisational level and thus defined as the perceptions of employees on organisation or its management commitments towards encouraging the optimal use of e-training system by providing guidance, assistance, and encouragement to employees in order to improve e-training systems use.

1.8.9 Trust (TRS)

Grandison and Sloman (2000) defined trust as the firm belief in the competence of an entity to act dependably, securely, and reliably within a specified context (assuming dependability covers reliability and timeliness). Trust in this study refers to the extent to which employees consider e-training system to be functional, reliable, secure, trustworthy, and in their best interest.

1.9 Structure of this thesis

The structure of this thesis, which shows how it is organised and the processes involved, is captured in Figure 1.1 below
1.10 Summary

In this chapter, background of the study was presented and the problem of the study was identified and discussed. Similarly, the related research questions and objectives were outlined. The chapter also discussed the significance, scope, and limitations of the study. A structure of the research proposal has equally been presented. The next chapter will provide the conceptual and theoretical background of the study.
REFERENCES


improvement in a motor-cognitive task by using EEG, ECG and EOG signals. *Brain topography*. 29(1), 149-161.


Byrne, B. (2010). Structural equation modeling using AMOS. *Basic concepts, applications, and programming*.


Fornell, C. and Larcker, D.F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of marketing research. 382-388.*


Liu, Y. and Shrum, L. (2002). What is interactivity and is it always such a good thing? Implications of definition, person, and situation for the influence of interactivity on advertising effectiveness. *Journal of advertising*. 31(4), 53-64.


Moore, M.G. (2002). Editorial, what does research say about the learners using computer-mediated communication in distance learning? *The American Journal of Distance Education.* 16(2), 61-64.


