DISTANCE-MEDIATED CHRISTIAN HIGHER EDUCATION:
STUDENT PERCEPTIONS OF THE FACILITATIVE NATURE OF
SELECTED INSTRUCTIONAL DEVELOPMENT FACTORS

John G. Nill, B.A., M.A.

Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

May, 2001

APPROVED:

D. Barry Lumsden, Major Professor
Mark Mortensen, Minor Professor
Ronald W. Newsom, Committee Member and
Program Coordinator for Higher Education
M. Jean Keller, Dean of the College of Education
C. Neal Tate, Dean of the Robert B. Toulouse
School of Graduate Studies

Doctor of Philosophy (Higher Education), May 2001, 273 pp., 234 tables, 4 illustrations, references, 97 titles.

A national survey was conducted to assess student perceptions of the helpfulness of specific instructional development factors in a distance education print-based program. Participants were all students who had successfully completed at least one distance education correspondence course with Global University or were currently enrolled in their first course. Instructional development factors studied included lesson openers, lesson outlines, lesson artwork, written objectives, amount of information presented before a study question is asked, typographical features, graphic art, study questions, answers to study questions, self tests, and unit progress evaluations. Basic demographic information was collected and survey respondents located their perceptions of instructional development factor helpfulness both on a Likert scale and on a rank-order scale. Respondents also were asked for comments on the instructional development factors studied. Differences among respondent groups were examined.

Major findings include a tiered ranking by all groups showing formative evaluation factors to be the most helpful, content organization and presentation factors next most helpful, and visual enhancement features (graphic art, typographical design) the least helpful. Overall, perceptions of the facilitative nature of the instructional development factors were similar among most groups. Older students seem to focus more on organization while younger students exhibit a balance between their perceptions of the facilitative nature of content and testing. Students enrolled in their first course perceive several of the formative evaluation factors to be less helpful.
than do more experienced students while at the same time perceiving content pacing to be more helpful than do more experienced students.
ACKNOWLEDGEMENTS

The author wishes to express deep gratitude to the people and institutions that made this research and dissertation possible. The author is indebted to Global University for the funding and logistical support for the research. Special thanks go to Dr. Gary Seevers and the staff of Institutional Research and Development for their assistance.

The author also wishes to express special thanks to the members of his doctoral committee. Dr. Barry Lumsden, Chairman of the committee, offered continuous encouragement and suggestions for improvement to the work at all stages. In particular, his role as mentor proved invaluable to the research process. Dr. Ron Newsom, Coordinator of the Program in Higher Education at the University of North Texas, and Dr. Mark Mortensen, assistant professor in the Department of Computer Education and Cognitive Systems at the University of North Texas, served on the committee and contributed numerous suggestions and reflections on the work in progress. The comments of all three committee members were extremely helpful.

Finally, the author is indebted to his parents for modeling the slogan, “Whatever you do, do it the best you can.” He is also deeply grateful to his wife, Dena, for her unwavering encouragement and support, and for her help with editing and mailings. He is also thankful to his children, Jason and Jennifer, for tolerating Dad’s absences during the doctoral program.
TABLE OF CONTENTS

LIST OF TABLES ........................................................................................................... vi

LIST OF ILLUSTRATIONS ....................................................................................... xiv

Chapter
1. INTRODUCTION ................................................................................................ 1
   Introduction
   Distance Education: Operational Definition
   Statement of the Problem
   Rationale
   Theoretical Framework
   Research Venue: Global University
   Purposes of the Study
   Significance of the Study
   Research Questions
   Research Hypotheses
   Delimitations
   Limitations
   Definition of Terms
   Organization of the Study

2. REVIEW OF THE LITERATURE ................................................................. 17
   Introduction
   Distance Education: Historical Development
   Instructional Design and Development: An Overview
   Learning Theory and Instructional Development:
      An Overview
   Gagné’s Model and Global University Instructional Development
   Research on Print-Related Instructional Development
   Factor One: Introductory Material
   Factor Two: Stated Objectives
   Factor Three: Content Presentation
   Factor Four: Typographical Design
   Factor Five: Graphic Art
   Factor Six: Inserted Questions
**LIST OF TABLES**

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demographic Data</td>
<td>62</td>
</tr>
<tr>
<td>2</td>
<td>Responses to Question 6: Lesson openers helped me succeed in the courses</td>
<td>66</td>
</tr>
<tr>
<td>3</td>
<td>Responses by gender to Question 6: Lesson openers helped me succeed in the courses</td>
<td>66</td>
</tr>
<tr>
<td>4</td>
<td>Responses by age to Question 6: Lesson openers helped me succeed in the courses</td>
<td>67</td>
</tr>
<tr>
<td>5</td>
<td>Responses by ethnic background to Question 6: Lesson openers helped me succeed in the courses</td>
<td>68</td>
</tr>
<tr>
<td>6</td>
<td>Responses by number of courses completed to Question 6: Lesson openers helped me succeed in the courses</td>
<td>70</td>
</tr>
<tr>
<td>7</td>
<td>Responses by recency of study to Question 6: Lesson openers helped me succeed in the courses</td>
<td>71</td>
</tr>
<tr>
<td>8</td>
<td>Responses to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in course completion</td>
<td>72</td>
</tr>
<tr>
<td>9</td>
<td>Responses by gender to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion</td>
<td>73</td>
</tr>
<tr>
<td>10</td>
<td>Responses by age to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion</td>
<td>74</td>
</tr>
<tr>
<td>11</td>
<td>Responses by ethnic background to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion</td>
<td>76</td>
</tr>
<tr>
<td>12</td>
<td>Responses by number of courses completed to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion</td>
<td>77</td>
</tr>
<tr>
<td>13</td>
<td>Responses by recency of study to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion</td>
<td>79</td>
</tr>
<tr>
<td>14</td>
<td>Responses to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses</td>
<td>80</td>
</tr>
<tr>
<td>15</td>
<td>Responses by gender to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses</td>
<td>81</td>
</tr>
<tr>
<td>16</td>
<td>Responses by age to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses</td>
<td>82</td>
</tr>
<tr>
<td>17</td>
<td>Responses by ethnic background to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses</td>
<td>83</td>
</tr>
<tr>
<td>18</td>
<td>Responses by number of courses completed to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses</td>
<td>84</td>
</tr>
<tr>
<td>19</td>
<td>Responses by recency of study to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses</td>
<td>85</td>
</tr>
<tr>
<td>Number</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>38</td>
<td>Responses to Question 9: Written objectives helped me succeed in the courses</td>
<td>108</td>
</tr>
<tr>
<td>39</td>
<td>Responses by gender to Question 9: Written objectives helped me succeed in the courses</td>
<td>109</td>
</tr>
<tr>
<td>40</td>
<td>Responses by age to Question 9: Written objectives helped me succeed in the courses</td>
<td>110</td>
</tr>
<tr>
<td>41</td>
<td>Responses by ethnic background to Question 9: Written objectives helped me succeed in the courses</td>
<td>111</td>
</tr>
<tr>
<td>42</td>
<td>Responses by number of courses completed to Question 9: Written objectives helped me succeed in the courses</td>
<td>112</td>
</tr>
<tr>
<td>43</td>
<td>Responses by recency of study to Question 9: Written objectives helped me succeed in the courses</td>
<td>113</td>
</tr>
<tr>
<td>44</td>
<td>Responses to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion</td>
<td>114</td>
</tr>
<tr>
<td>45</td>
<td>Responses by gender to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion</td>
<td>115</td>
</tr>
<tr>
<td>46</td>
<td>Responses by age to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion</td>
<td>116</td>
</tr>
<tr>
<td>47</td>
<td>Responses by ethnic background to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion</td>
<td>118</td>
</tr>
<tr>
<td>48</td>
<td>Responses by number of courses completed to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion</td>
<td>119</td>
</tr>
<tr>
<td>49</td>
<td>Responses by recency of study to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion</td>
<td>121</td>
</tr>
<tr>
<td>50</td>
<td>Responses to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses</td>
<td>122</td>
</tr>
<tr>
<td>51</td>
<td>Responses by gender to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses</td>
<td>123</td>
</tr>
<tr>
<td>52</td>
<td>Responses by age to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses</td>
<td>124</td>
</tr>
<tr>
<td>53</td>
<td>Responses by ethnic background to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses</td>
<td>125</td>
</tr>
<tr>
<td>54</td>
<td>Responses by number of courses completed to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses</td>
<td>126</td>
</tr>
<tr>
<td>55</td>
<td>Responses by recency of study to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses</td>
<td>127</td>
</tr>
</tbody>
</table>
Responses to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion ........................................................................129

Responses by gender to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion ........................................................................130

Responses by age to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion ........................................................................131

Responses by ethnic background to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion ........................................................................133

Responses by number of courses completed to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion ........................................................................135

Responses by recency of study to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion ........................................................................136

Responses to Question 11: The differences in type helped me succeed in the courses ...................................................................................................138

Responses by gender to Question 11: The differences in type helped me succeed in the courses ................................................................................139

Responses by age to Question 11: The differences in type helped me succeed in the courses ................................................................................139

Responses by ethnic background to Question 11: The differences in type helped me succeed in the courses ........................................................................140

Responses by number of courses completed to Question 11: The differences in type helped me succeed in the courses ........................................................................142

Responses by recency of study to Question 11: The differences in type helped me succeed in the courses ........................................................................143

Responses to Question 22: Rank differences in type from 1 to 11 in order of helpfulness in successful course completion ........................................................................144

Responses by gender to Question 22: Rank differences in type from 1 to 11 in order of helpfulness in successful course completion ........................................................................145

Responses by age to Question 22: Rank differences in type from 1 to 11 in order of helpfulness in successful course completion ........................................................................146

Responses by ethnic background to Question 22: Rank differences in type from 1 to 11 in order of helpfulness in successful course completion ........................................................................148

Responses by number of courses completed to Question 22: Rank differences in type from 1 to 11 in order of helpfulness in successful course completion ........................................................................149
Responses by recency of study to Question 22: Rank differences in type from 1 to 11 in order of helpfulness in successful course completion

Responses to Question 12: Graphic art helped me succeed in the courses

Responses by gender to Question 12: Graphic art helped me succeed in the courses

Responses by age to Question 12: Graphic art helped me succeed in the courses

Responses by ethnic background to Question 12: Graphic art helped me succeed in the courses

Responses by number of courses completed to Question 12: Graphic art helped me succeed in the courses

Responses by recency of study to Question 12: Graphic art helped me succeed in the courses

Responses to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion

Responses by gender to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion

Responses by age to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion

Responses by ethnic background to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion

Responses by number of courses completed to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion

Responses by recency of study to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion

Responses to Question 13: The study questions in each lesson helped me succeed in the courses

Responses by gender to Question 13: The study questions in each lesson helped me succeed in the courses

Responses by age to Question 13: The study questions in each lesson helped me succeed in the courses

Responses by ethnic background to Question 13: The study questions in each lesson helped me succeed in the courses

Responses by number of courses completed to Question 13: The study questions in each lesson helped me succeed in the courses

Responses by recency of study to Question 13: The study questions in each lesson helped me succeed in the courses

Responses to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion

Responses by gender to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion

Responses by age to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion

Responses by ethnic background to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion

Responses by number of courses completed to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion

Responses by recency of study to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion...
Responses by age to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................175

Responses by ethnic background to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................177

Responses by number of courses completed to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................178

Responses by recency of study to Question 24: Rank the study questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................180

Responses to Question 14: The answers to the study questions at the end of each lesson helped me succeed in the courses.......................................................................................................181

Responses by gender to Question 14: The answers to the study questions at the end of each lesson helped me succeed in the courses ............................................................................................182

Responses by age to Question 14: The answers to the study questions at the end of each lesson helped me succeed in the courses ............................................................................................183

Responses by ethnic background to Question 14: The answers to the study questions at the end of each lesson helped me succeed in the courses ............................................................................................184

Responses by number of courses completed to Question 14: The answers to the study questions at the end of each lesson helped me succeed in the courses ............................................................................................185

Responses by recency of study to Question 14: The answers to the study questions at the end of each lesson helped me succeed in the courses ............................................................................................186

Responses to Question 25: Rank the answers to the study questions from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................187

Responses by gender to Question 25: Rank the answers to the study questions from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................188

Responses by age to Question 25: Rank the answers to the study questions from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................189

Responses by ethnic background to Question 25: Rank the answers to the study questions from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................191

Responses by number of courses completed to Question 25: Rank the answers to the study questions from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................192

Responses by recency of study to Question 25: Rank the answers to the study questions from 1 to 11 in order of helpfulness in successful course completion.......................................................................................................194
110 Responses to Question 15: The self-tests at the end of each lesson helped me succeed in the courses ................................................................. 195
111 Responses by gender to Question 15: The self-tests at the end of each lesson helped me succeed in the courses ....................................................... 196
112 Responses by age to Question 15: The self-tests at the end of each lesson helped me succeed in the courses ....................................................... 197
113 Responses by ethnic background to Question 15: The self-tests at the end of each lesson helped me succeed in the courses ................................ 198
114 Responses by number of courses completed to Question 15: The self-tests at the end of each lesson helped me succeed in the courses .......... 199
115 Responses by recency of study to Question 15: The self-tests at the end of each lesson helped me succeed in the courses ................................... 200
116 Responses to Question 26: Rank the self-tests at the end of each lesson from 1 to 11 in order of helpfulness in successful course completion ................................................................. 201
117 Responses by gender to Question 26: Rank the self-tests at the end of each lesson from 1 to 11 in order of helpfulness in successful course completion ................................................................. 202
118 Responses by age to Question 26: Rank the self-tests at the end of each lesson from 1 to 11 in order of helpfulness in successful course completion ................................................................. 203
119 Responses by ethnic background to Question 26: Rank the self-tests at the end of each lesson from 1 to 11 in order of helpfulness in successful course completion ................................................................. 205
120 Responses by number of courses completed to Question 26: Rank the self-tests at the end of each lesson from 1 to 11 in order of helpfulness in successful course completion ................................................................. 206
121 Responses by recency of study to Question 26: Rank the self-tests at the end of each lesson from 1 to 11 in order of helpfulness in successful course completion ................................................................. 208
122 Responses to Question 16: The UPE’s at the end of each unit helped me succeed in the courses ................................................................. 209
123 Responses by gender to Question 16: The UPE’s at the end of each unit helped me succeed in the courses ................................................................. 210
124 Responses by age to Question 16: The UPE’s at the end of each unit helped me succeed in the courses ................................................................. 211
125 Responses by ethnic background to Question 16: The UPE’s at the end of each unit helped me succeed in the courses ................................................................. 212
126 Responses by number of courses completed to Question 16: The UPE’s at the end of each unit helped me succeed in the courses ................................................................. 213
127 Responses by recency of study to Question 16: The UPE’s at the end of each unit helped me succeed in the courses ................................................................. 214
128 Responses to Question 27: Rank the UPE’s from 1 to 11 in order of helpfulness in successful course completion ................................................................. 215
129 Responses by gender to Question 27: Rank the UPE’s from 1 to 11 in order of helpfulness in successful course completion ................................................................. 216
130 Responses by age to Question 27: Rank the UPE’s from 1 to 11 in order of helpfulness in successful course completion ................................................................. 217
131 Responses by ethnic background to Question 27: Rank the UPE’s from 1 to 11 in order of helpfulness in successful course completion ................................................................. 219
132 Responses by number of courses completed to Question 27: Rank the UPE’s from 1 to 11 in order of helpfulness in successful course completion ................................................................. 220
133 Responses by recency of study to Question 27: Rank the UPE’s from 1 to 11 in order of helpfulness in successful course completion ................................................................. 222
134 Additional comments of respondents ................................................................. 223
# LIST OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Example of a Global University Lesson Organizer</td>
<td>35</td>
</tr>
<tr>
<td>2  Example of a Global University Lesson Development</td>
<td>36</td>
</tr>
<tr>
<td>3  Global University Undergraduate Instructional Development</td>
<td>38</td>
</tr>
<tr>
<td>4  Correspondence of Global University Instructional Development Factors</td>
<td>39</td>
</tr>
<tr>
<td>With Gagné’s Nine Events of Instruction</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

Faculty in higher education are concerned with a variety of educational themes, all equally important in one sense or another. Themes most directly related to teaching and learning include quality of educational experience, the educational environment, student learning styles, effective teaching methodologies, validity and reliability in measurement, and the like. Such concerns dictate that higher education be creative in its approach to education without straying too far down the paths of independence or eccentricity. As Perry and Smart (1997) observe, colleges and universities are “required to be increasingly accountable for their traditional roles, while simultaneously expected to be responsive to society’s changing priorities and pressures” (p. 1). No easy challenge, yet given the nature, importance, and cost of modern higher education, one that must be pursued.

Within the arena of higher education a particularly important trend has emerged, notably in the last half of the 20th century: distance education. It has emerged and grown because it meets specific educational needs, because it helps level educational access, and because technological advancements have facilitated and encouraged its growth. Distance education is, in a genuine sense, realizing Perry and Smart’s criterion of responsiveness to changing societal needs.

The same concerns, however, expressed in regard to traditional higher education methods are also aimed at distance education, and rightly so. In addition, perhaps because
distance education has been viewed as suspect education, the concerns seem to be voiced louder and longer.

In a sense, distance education’s “feet are being held to the fire.” While it is logical that, as a form of education, it be held accountable to the same standards of effectiveness and outcomes, its methodological nature demands flexibility in the way it is approached, studied, and understood.

The present study concerned itself with the evaluation of a particular program of distance education by correspondence. The study investigated the effectiveness of that program in producing a successful distance education experience among students. To accomplish this, the approach collected data from the students’ perspective, evaluated the data, and drew conclusions. The entire study was based on a key question applicable to all education: what factors contribute to a successful educational experience? By identifying those factors that facilitate learning and lead to positive educational outcomes and experience, the study contributes to the growing body of literature that reinforces the soundness and reliability of distance education. Continued research in such areas is crucial to establishing and underlining the viability of this form of education, thereby paving the way for a wider acceptance of distance education.

Distance Education: Operational Definition

Distance education has emerged as one of the more visible and significant trends in contemporary higher education, particularly since World War II. Neither verbal sparring over definition (c.f. Garrison & Shale, 1987; Keegan, 1988) nor debate over the choice of terminology (Chacón, 1985) nor questions concerning the quality,
effectiveness, and reliability of evaluation have hindered the phenomenal growth of
distance education as a significant movement on the higher education landscape in
general or within Christian higher education specifically.

Essentially, distance education is defined by four elements: the delivery of
instruction in which there is separation (geographic and transactional) of teacher and
student, the bridging of that separation by some form(s) of technology, the influence of
an educational organization, and the provision of two-way communication between the
Clark, 1991; Willis, 1993). The most marked philosophical contrast between distance
education and traditional face-to-face education, then, is that instead of the learner
coming to the teacher to receive knowledge, the teacher takes (sends) the knowledge to
the learner.

In general, the term *distance education* (as opposed to other terms, sometimes
used interchangeably, such as *distributed education, correspondence study, independent
study, or open learning* [Chacón, 1985]), has evolved from its correspondence study
beginnings and is now used to refer to a wide range of methods for teaching students
outside the traditional face-to-face classroom setting. The term covers delivery methods
ranging from correspondence study to videotaped lectures to asynchronous Internet-based
threaded discussions to interactive (two-way video, two-way audio) television.

Statement of the Problem

This study involved the assessment of an institution-specific instructional
development model of print-based distance education materials as perceived by students
who had completed one or more courses within the program or who were currently enrolled in their first course.

Rationale

In the field of instructional development in distance education, little research exists in the area of student assessment of a theory’s elements. The research categorized in the Educational Resources Information Center (ERIC) from 1966 to 1999 lists 5693 articles on the general topic of distance education. Of these, 571 articles, or nearly 10%, address issues of instructional design within distance education. Approximately 40 of these articles (7%) deal with student evaluation of distance education, and these tend to revolve around evaluation of the technology used or site-related issues. Little is found concerning student evaluation of instructional development of printed materials as used in distance education. Even a review of Christian and theological higher education journals via the American Theological Library Association and Religious and Theological Abstracts (with specific attention paid to Research on Christian Higher Education, the Journal of Research on Christian Education, Christian Education Journal, and Faculty Dialog) reveals a scarcity of research involving distance education and certainly nothing remotely related to instructional design or development within the genre. There is an obvious gap in the literature exploring students’ perspectives of the facilitative nature of instructional development factors within the arena of Christian distance education.

Willis (1993) states that “print is the foundation of distance education and the basis from which all other delivery systems have evolved” (p. 96). Holmberg (1981,
1989) supports this, adding that printed materials alone can be effective teaching tools, although they are frequently accompanied by other media in organized distance education efforts. Verduin and Clark (1991) note that print has historically been, and will continue to be, the principal medium used in distance education. Willis (1993) adds that the major universities engaged in distance education continue to rely on printed materials as the foundation of their distance courses. In an age of increasingly sophisticated technology, print maintains several advantages as a distance education delivery mode, including ease of access and use, low cost, and efficiency for delivering large amounts of content (Willis, 1993; Misanchuk, 1994). Print, then, is found in most distance education efforts, often in combination with other (more sophisticated) media as part of a delivery “package.”

Based, then, on the understanding that print delivery has been, and evidently will continue to be, an integral part of distance education, several general questions arise. How should print-based distance education be done? What instructional development works best when teaching at a distance through print? What instructional development factors do students consider the most helpful in correspondence courses? How can the most successful factors of instructional development be identified? If the best practices of instructional development can be documented, it seems evident that distance teaching and learning can be improved.

To a degree, identifying the theoretical basis of an instructional design system lends authority to its use. Elements of such a system can be considered reliable. However, it seems rational to include in the identification process input from students who have
studied at a distance and are familiar with the instructional program in question. The purpose of this study was to elicit and examine student perceptions of a particular program of distance education instructional development. In addition, since, theoretically, elements of instructional development for print-based distance education can be directly applied to or modified for other distance delivery methods, the results of this study should be applicable to distance education across the board.

Theoretical Framework

All education is based on instructional design and development, which in turn are based on learning theory. Principal learning theories include behaviorist, cognitive, gestalt, and neuro-chemical orientations. Chief among these on the current educational landscape are the cognitive and behaviorist theories. Essentially, behaviorists emphasize performance while cognitivists emphasize knowledge and knowledge-processing as the evidences of learning. Stated in another way, behaviorists emphasize an external, and cognitivists an internal, approach to assessing learning experiences (Richey, 1986). Since the 1970s there has been a trend toward the cognitive approach (Richey, 1986; Valcke, et al., 1993). In particular, Gagné and Briggs’ (1974, 1977) instructional theory seems to incorporate elements of both behaviorism and cognitivism, though it leans more toward the latter.

Learning theory leads logically to instructional design, since one who begins with a theory of teaching and learning requires some systematic (as opposed to haphazard) approach to instructing. Instructional design and, subsequently, instructional development are simply means of solving identified problems in human performance (Wagner, 1990).
Again, Gagné (1985) developed an instructional sequence based on his instructional theory. The result is known as the “nine events of instruction” and has become a widely-respected broad approach to instruction that is adaptable to both traditional classroom-based instruction and to distance education in its varied forms. Gagné’s instructional sequence gives rise to identifiable components that can be used in the classroom or in distance delivery formats. These include such elements as advance organizers, keyword lists, stated objectives, in-text study questions, the use of graphics (pictures, illustrations, tables, charts, and so forth), textual formatting, formative and summative evaluation, feedback, etc.

Because of the transactional element inherent in distance education, this form of education in particular demands sound instructional development. Components of instructional development such as those suggested by Gagné’s nine events of instruction help bridge that transactional gap by adding a sense of interaction between the learner and the instructor (Misanchuk, 1994).

Based, then, on educational theory, certain factors of instructional development can be identified and incorporated into the teaching process. However, it is important to know if distance education students identify those same elements as significant in producing successful course completion. Their identifications of the importance of the instructional elements can be correlated to course grades and GPAs. This allows instructional development specialists and professors alike to build better courses by improving instructional development, which, in distance education, is critical.
This study identified elements of instructional development that students perceive to be most helpful in their success in distance education correspondence courses, thereby identifying a link between instructional design and successful course completion. This study identifies and examines the elements of college-level instructional development of Global University, which relies primarily on print-based delivery.

Research Venue: Global University

The principal investigator chose Global University (GU), a church-affiliated (Assemblies of God) educational institution offering a variety of educational levels, from non-credit to baccalaureate and masters degrees. GU offers these courses and programs worldwide via distance delivery methods, of which the primary delivery method is print. George Flattery founded Global University in 1967 as International Correspondence Institute, or ICI. The institution maintained its international headquarters in Brussels, Belgium until 1991, when it moved to Irving, Texas, and changed its name to ICI University. In 2000, ICI University moved to Springfield, Missouri, merged with its sister school, Berean University, with the combined entity renamed The Global University System.

Global University’s courses are approved by the American Council on Education (ACE), and the institution is accredited by the Distance Education and Training Council (DETC) and was approved by the Texas Higher Education Coordinating Board (THECB) to grant degrees in the state of Texas. Upon its move to Missouri, the Missouri Coordinating Board for Higher Education granted approval for GU to grant degrees in
Missouri. Global University is currently applying for regional accreditation with the North Central Association of Colleges and Schools.

In the 32 years that ICI University operated alone (before the 2000 merger), it granted 1900 baccalaureate degrees and compiled an undergraduate course completion rate of 80.1% and an average course grade of 80.9. Global University currently services approximately 7000 active undergraduate students located in more than 150 countries, including the United States. Most of these students study in English (either as their first or second language), but courses and/or entire programs are offered in several other major languages, including Spanish, French, Finnish, Russian, and Korean. Materials are produced in English and translated into foreign languages by translation teams. Approximately 18% of Global University’s students study in languages other than English (GU institutional records). On the undergraduate level, Global University offers five Bachelor of Arts degrees and four Associate of Arts degrees. The Bachelor’s degrees are in bible and theology, religious education, missions, and pastoral ministries. The associate’s degrees are in religious studies, ministerial studies, bible and theology, and church ministries. Diplomas in ministry or theology are also offered.

Global University is specifically and exclusively designed for distance education. It has no traditional central “campus” per se, although its international office in Springfield, Missouri, houses most of the traditional higher education administrative and academic departments such as student services, enrollment, finance, Deans’ offices, library services, instructional development, and technology and training. Global University employs a global network of national directors and adjunct faculty to service
and maintain personal contact with students in countries other than the United States. It also offers a system of web-based and traditional research and library resources.

Global University is both a university and a publisher. As a university, it develops and offers courses and degree programs, seeks and maintains accreditation, enrolls students, keeps records, and grants degrees. As a publisher, it develops and publishes educational materials, uses those materials itself, and makes those materials available to other institutions. Thus a number of colleges and universities use GU undergraduate materials as the foundation for their own degree programs. At the same time, students may study directly through GU, obtaining their materials from a national director and, upon degree completion, receive their diplomas from the university.

Global University’s college courses are prepared by the its Undergraduate Materials Development department, the staff of which includes instructional development specialists, editors, and proofreaders. Course development is a multi-stage process that can be summarized in five broad terms: 1) author selection and orientation, 2) course writing and review, 3) instructional development, 4) editing, proofing, and desktop publishing, and 5) evaluation and revision. Courses are offered by print, Internet, and videoconferencing. However, print is by far the most-used method of delivery. A few courses make use of audiotapes.

Undergraduate courses are self-contained and designed to be studied alone or in small groups. However, approximately 250 Bible schools, seminaries, and other institutions worldwide use GU materials exclusively for their classroom courses, while other institutions use the materials non-exclusively.
While the instructional development used in GU undergraduate courses can be considered a hybrid system, it is based heavily on Gagné’s “Nine Events of Instruction” model (Gagné, 1974, 1988). It is a hybrid in the sense that within the framework of Gagné’s model, the ideas of other educational theories and theorists are included to one degree or another, i.e. Ausubel’s concept of advance organizers (Ausubel, 1963, 1968), Mager’s approach to writing instructional objectives (Mager, 1975), mastery learning concepts, and the levels of Bloom’s taxonomy of educational objectives in the cognitive domain (Bloom, 1956).

Purposes of the Study

The purposes of this study were to:

1) determine student perceptions of the facilitative nature of selected instructional development factors in printed distance education materials published by Global University;

2) identify differences between male and female student perceptions of the facilitative nature of instructional development factors in printed distance education materials published by Global University;

3) identify differences between older and younger student perceptions of the facilitative nature of instructional development factors in printed distance education materials published by Global University;

4) identify differences among ethnic student group perceptions of the facilitative nature of instructional development factors in printed distance education materials published by Global University; and
5) identify differences in student perceptions of the facilitative nature of instructional development factors in printed distance education materials published by Global University based on time in program (i.e., familiarity with a specific instructional development system).

Significance of the Study

A study of student perceptions of the facilitative nature of instructional development factors is important for at least two reasons. Evaluation of an institution-specific program may provide information that will allow that institution to improve its printed distance education materials, and thereby improve the quality of education it offers to its students. Evaluation of the relationship of instructional development to specific demographic data may point to the need to produce materials that emphasize a certain factor or factors for specific demographically-defined groups. Finally, the research conducted at Global University will contribute to the limited body of knowledge on student perceptions of the facilitative nature of instructional development factors in printed distance education materials.

Research Questions

1) What are the differences between perceptions of the facilitative nature of instructional development factors of male students and female students?

2) What are the differences between perceptions of the facilitative nature of instructional development factors of older students and younger students?

3) What are the differences between perceptions of the facilitative nature of instructional development factors of Caucasian students and minority students?
4) What are the differences between perceptions of the facilitative nature of instructional development factors of students who have more exposure to a specific instructional development system and those who have less exposure to the system?

Research Hypotheses

The null hypotheses were stated as:

HO1: There is no difference between perceptions of the facilitative nature of instructional development factors of male and female students.

HO2: There is no difference between perceptions of the facilitative nature of instructional development factors of older students and younger students.

HO3: There is no difference between perceptions of the facilitative nature of instructional development factors of different ethnic groups.

HO4: There is no difference between perceptions of the facilitative nature of instructional development factors of students who have more exposure to a particular instructional development program and those who have less exposure to the program.

Delimitations

The principal investigator presumed the following delimitations for the purposes of the study:

1) Participants in the study were limited to Global University students who were American citizens. This precluded participation by those whose immediate ethnic, cultural, and educational backgrounds are non-US.

2) Participants in the study were limited to Global University students who were either active or had been recently inactivated. This assured student familiarity
and mental freshness with the Global University system of instructional development.

3) Participation in the study was limited to students who studied Global University print-based courses only. No courses delivered by internet, two-way video conferencing, CAI, or other electronic means were considered.

Limitations

A limitation of the study was that none of the randomly selected individuals were required to respond to the survey instrument. Participation was voluntary. An incentive (a copy of the survey results) was offered to participants.

An additional limitation was that almost 100% of Global University students are practicing Christians, many of whom either are professional ministers or occupy positions in church lay leadership. The study did not take into account any “Christian” motivational or personality characteristics.

Definition of Terms

Principal terms of the study are defined as follows:

**Distance education**: A form of education in which teacher and student(s) are separated geographically and transactionally and in which that separation is bridged by some sort of technological link. Some format of two-way communication between teacher and learner(s) is present, and the influence of an educational institution, primarily for quality assurance, record-keeping, and degree-granting are also inherent.

**Instructional development**: The step within an instructional design process in which instructional materials are developed.
**Instructional design:** The process, often 5-step, by which instructional needs are identified and addressed.

**Print-based education:** A form of distance education in which the learning depends wholly or nearly wholly on printed materials such as books, tutorials, study guides, student packets, and so forth. Usually synonymous with correspondence studies (see above).

**Correspondence studies:** A form of distance education in which learning is conducted via correspondence, often postal but open to e-mail or fax. Usually synonymous with print-based education (see below).

**Traditional education:** Often used as the opposite of distance education. Refers to the long-established or conventional system of seat-based education occurring in brick-and-mortar institutions.

**Organization of the Study**

Chapter I presents an overview of distance education and the concepts of instructional design and instructional development. The research problem is stated along with research questions and research hypotheses. A description of the research venue (the institution from whose population the sample was drawn) is given. The theoretical framework of the study is also presented. Assumptions, delimitations, and limitations of the research are noted, and research-specific key terms are defined.

Chapter II presents a review of the literature on instructional development and establishes the link between instructional development and learning theory. The correspondence between the Gagné model of instructional development and Global
University’s instructional development is established. A literature review related to each factor of instructional development is presented. Finally, a review of the literature linking instructional development and student success is included.

Chapter III describes the research methodology. Research questions and design are presented. Procedures for the selection of population and sample are discussed. Instrumentation is also discussed. Finally, the procedures for collection and analysis of data are described.

Chapter IV presents the analysis of data collected. Descriptions of data distributions and results of the investigations of the research questions are also presented. Statistical test results are included.

Chapter V presents a summary of the study, along with a discussion of its findings. Conclusions of the study, recommendations for application, and recommendations for future research are also included.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The discussion in Chapter I leads logically to the following questions which guide the review of the literature: 1) What role does distance education play in the broader arena of modern higher education? 2) What is the association between educational theory and instructional development? 3) What is the association between instructional development factors and student achievement in distance education? and 4) What gap can be identified in the research linking instructional development and student achievement in print-based distance education?

Distance Education: Historical Development

Distance education began with print-based correspondence courses, which remained the standard method of delivery until the middle of the 20th century, when instructional radio and television came into being. In the 1990s, interactive technologies became popular. Today, many institutions of higher education offer courses by distance education combining two or more delivery methods. The phenomenon has grown from rather obscure beginnings to its current influence over a broad spectrum of society, including roughly forty-four percent of institutions of higher education by the late 1990s (U. S. Department of Education, 2000).

The origins of distance education date back only two or three centuries, although Verduin and Clark (1991) suggest the interesting possibility of rudimentary forms of
distance education for tutoring royal offspring in ancient civilizations. The March 20, 1728 issue of the Boston Gazette carried an advertisement offering lessons in shorthand by mail (Verduin & Clark, 1991). This seems to have been the first identifiable attempt at public distance education. Purists contest this opinion, however, since there was no indication of two-way teacher-student communication and there does not seem to have been a grading system in use.

The first successful attempt at an organized form of distance education is usually traced to Isaac Pitman, who offered correspondence course shorthand lessons in England beginning in 1840 (Verduin & Clark, 1991). Pitman’s correspondence courses grew quickly in popularity, requiring a staff to handle the system. Shortly thereafter, in 1856, Charles Toussaint and Gustav Langenscheidt began a language school offering German and French lessons by correspondence (Watkins & Wright, 1991). The rapid growth of distance education in the 20th century traces its origins to these simple correspondence courses of the mid-1800s (Sherow & Wedemeyer, 1990).

MacKenzie, Christensen, and Rigby (1968) attribute the development of American distance education efforts to the country’s westward expansion, the impact of the Industrial Revolution, and the changing role of women in American society. Correspondence instruction arose as a means of training a growing population in an expanding nation. For example, Anna Ticknor’s Society to Encourage Studies at Home, founded in 1873, was the first private organized correspondence effort in the United States, with a clientele consisting primarily of women (Watkins & Wright, 1991). Ticknor’s Society offered history, science, art, literature, and French and German
language studies to its students, and made use of the mail to exchange ideas between students and teachers (Verduin & Clark, 1991; MacKenzie et al., 1968).

The concept of correspondence instruction rapidly expanded to affect other sectors of American society. The needs of high schools became a focus of attention in the late 1800s. Benton Harbor, Michigan, became a leader in this sector in 1923 with its program of correspondence courses for high school vocational teaching (MacKenzie et al., 1968). Other cities followed and universities such as Nebraska quickly entered the arena by facilitating high school correspondence programs. Adult continuing education remained an ongoing concern. State legislatures and/or departments of education in such states as Massachusetts, Oregon, North Dakota, and Montana began offering distance education for adults as early as 1915 (MacKenzie et al., 1968).

Education for military personnel became a prime focus during World War II. During its 32-year history, the United States Armed Forces Institute (USAIFI), organized in 1943 and with the help of International Correspondence Schools and the University of Wisconsin, offered elementary, high school, college, and technical/vocational courses by correspondence to over seven million service personnel (Watkins & Wright, 1991). Education and training for religious leaders and laity emerged as another significant area to which correspondence education contributed. Moody Bible Institute was one of the earliest religious institutions to offer correspondence instruction, organizing its Correspondence School in 1901 (MacKenzie et al., 1968). Finally, the teaching of technical and vocational skills by correspondence study became one of the fastest-growing fields in the country. International Correspondence Schools (ICS) was born out
of Thomas Foster’s 1891 efforts to teach miners by correspondence instruction (Verduin & Clark, 1991; MacKenzie et al., 1968).

Distance education also began to infiltrate and influence American higher education. The well-known and respected Chautauqua movement was begun by John Vincent in 1878 as a church training center in southwestern New York. With a focus on adult education, and supported by well-known university faculty of the day, it prepared the way for university-level correspondence studies (Watkins & Wright, 1991). Illinois Wesleyan University’s correspondence courses comprised the first genuine higher education distance effort in the United States (Watkins & Wright, 1991). Beginning in 1877, its program offered bachelor’s, master’s, and doctoral degrees by correspondence throughout the country.

William Rainey Harper, however, elevated correspondence study to wider acceptability. The popularity of his courses at Baptist Theological Seminary in Morgan Park, Illinois in the 1870s led to summer courses and eventually to correspondence courses. Later, Harper joined Chautauqua, which in the meantime had become an accredited New York university, where his distance education efforts continued to grow. Harper eventually became president of the University of Chicago, where he organized a division of correspondence education that functioned for seventy-two years until the institution’s closure in 1964 (Verduin & Clark, 1991; MacKenzie et al., 1968).

Despite opposition within academe, other universities followed Chicago’s example by entering the correspondence instruction arena. By 1913, Pennsylvania State College, Baylor University, the University of Wisconsin, the University of California at
Berkeley, and the University of Nebraska had all added correspondence studies to their programs (MacKenzie et al., 1968). The University of Wisconsin’s correspondence department, which began in 1906, grew to become one of the more influential programs in the country (Watkins & Wright, 1991).

The concept and practice of distance education, then, are not new, particularly in the form of correspondence, or print-based, studies. The idea continues to affect all segments of society. Adult education enrollment continues to grow both on local campuses of postsecondary institutions as well as in programs such as the Public Broadcasting Service’s Adult Learning Service and in International Correspondence Schools. Secondary, postsecondary, and vocational studies are the foci in these programs.

However, in the post-World War II era the world has witnessed an unprecedented expansion of distance education efforts specifically in higher education. The war itself required certain specialized adult training which, in turn, led to expanded correspondence efforts among American universities. The Servicemen’s Readjustment Act of 1944, more commonly known as the G. I. Bill, provided financial resources for returning military veterans to attend college. The resulting numbers of adults entering the postsecondary market radically and permanently altered the higher education student profile. Twenty years later, the 1965 Higher Education Act’s Title I “provided federal funding for continuing higher education, offering states a way to support efforts to encourage lifelong learning” (Rohfeld, 1990, p. 125). Thus, American higher education acquired a growing student market coupled with funds to meet market needs.
From a global view, the post-World War II growth in distance education is seen in the proliferation of open and distance teaching universities such as those in Canada, China, Costa Rica, Germany, Spain, and the United Kingdom (Rumble & Harry, 1982), as well as in consortia and distance education systems. In the United States, the growth of distance education seems mainly to have been appended to traditional brick-and-mortar institutions and based on institutional mission (to expand education to non-traditional students) and institutional survival in an increasingly nontraditional educational market. This growth has been fueled by recent advancements in telecommunications technology, including the development of the Internet and its commercial outlet, the World Wide Web, and the accessibility of the personal computer. In the 1990s, however, some purely distance teaching institutions have appeared in the United States.

To illustrate the phenomenal numerical growth of distance higher education, one need only view figures published by the National Center for Educational Statistics for the past several years. For the academic year 1994-95, among U.S. institutions of higher education, the Center reported 33 percent of all higher education institutions offered courses by distance education, with a total of 25,730 courses offered during the academic year. Twenty-five percent of the institutions offered degrees that could be completed by distance education exclusively. For the same year, 3,430 degrees were awarded for programs that could be completed totally by distance education methods. Approximately 753,640 students formally enrolled in distance education courses. This represents 5.2 percent of the total of 14.3 million students enrolled in higher education in that academic year (U.S. Department of Education, 2000).
For the academic year 1997-98, among U.S. institutions of higher education, the National Center for Education Statistics reported 44 percent of all higher education institutions offered courses by distance education (an increase of 11 percent over the 1994-95 statistics), with a total of 54,470 courses offered during the academic year (roughly double the number of courses offered during the 1994-95 academic year). The Center reported 1,632,350 enrollments in all distance education courses, with 1,343,580 of these in college-level credit-granting courses. This is roughly double the number of enrollments from the 1994-95 academic year and represents 9.1 percent of the total higher education enrollment of 14.9 million. Additionally, 17 percent of higher education institutions said they intended to offer courses by distance education within the following three years (U.S. Department of Education, 2000). (Note: these NCES figures do not include data from private 2-year institutions since so few offered courses by distance methods.)

Clearly, distance education in all its delivery forms has established its presence on the higher education landscape. Its broad acceptance is based primarily on function: distance education makes one of higher education’s principal goals more achievable, and that is the notion of the level playing field, or equal opportunity for higher education. There are many who cannot or will not, for a variety of reasons, attend traditional classroom settings. Higher education possibilities for them are difficult if not impossible. Cannell (1999) points out that “schedule conflicts, costs, family responsibility, and professional commitments have encouraged the development of distance education options” (p. 6). Further, she notes that through distance education, “the tyranny of time,
place, and curriculum is gradually being broken” (p. 6). Others, including Keegan (1988) and Rossman (1995), emphasize distance education as a “complement” to traditional educational delivery.

It is important to note that the rapid growth and widespread influence of distance education have generated heated discussion, particularly concerning the reliability of the genre’s results. A number of traditional educators still view distance education with some skepticism. However, Moore and Thompson (1990) found that the results of learning by distance education methods are similar to the results of traditional education when the delivery methods and technologies are appropriate, when there is student interaction with other students, and when there is timely feedback to the student from the teacher. Patterson (1996), in an analysis of literature dating from the 1920s, found that students who study by correspondence do at least as well as students who study within the traditional mode. This “no significant difference” phenomenon is becoming increasingly well documented.

Instructional Design and Development: An Overview

A general statement linking educational purpose and instructional factors is apropos at this juncture, and is reflected in the following statement by Felker (1974):

The fundamental purpose of education is to impart the knowledge and skills necessary for functioning usefully in society. The means by which education produces this learning is through instruction. Since learning achievement ultimately is a function of instructional quality, it follows that a major concern of education is the identification of factors that comprise effective instruction and
the incorporation of these factors in classroom instructional materials and procedures. (p. 7)

While some might take exception to the term “impart” in Felker’s declaration, the remainder is arguably sound logic. One need only exchange “distance” for “classroom,” or remove it altogether, and the bridge is made to distance education. In other words, Felker’s argument is equally applicable to distance delivery methods.

One of the essential educational issues that arise in both theory and research is that of instructional design and development as applied to distance education. It is the principal researcher’s conviction that effective design and development are fundamental contributors to positive results in distance education. Here the terms instructional design and instructional development are used in a manner consistent with that of Briggs (1977), Romiszowski (1984), and Richey (1986). Instructional design is usually defined as a five-step process for solving an instructional problem, the steps involving assessment, design, development, implementation, and evaluation. Instructional development, the third step in the instructional design process, involves the creation and organization of components for delivering the instruction.

It is logical that instructional development be based upon sound educational theory. Numerous theories have been advanced, and these can be classified broadly as behavioral, cognitive, or eclectic (i.e., broad vs. narrow focus on issues pertaining to content, and multiple vs. single resources for instructional plans) (Reigeluth, 1987). Foremost among these is Gagné’s (Gagné & Briggs, 1974; Gagné, Briggs, & Wager, 1988) Task Analysis Theory with its outline of Nine Events of Instruction as a system of
presenting material (what Holmberg [1981] refers to as the contents and structure of a course).

Instructional development, obviously, is crucial to teaching and learning. How course content is arranged, presented, and supported, and how learning is evaluated, are indispensable factors leading to successful education. The traditional classroom setting, with both teacher and students present, allows a more flexible approach to instructional development. It becomes evident, though, that instructional development, or at least certain aspects of it, changes when one moves from traditional face-to-face instruction to distance delivery, particularly in printed correspondence materials. Crucial questions arise, such as: how does one bridge the gap between a teacher and student separated both geographically and transactionally? How does one evaluate achievement of objectives from a distance? How can a course include interactivity when students are studying at a distance? What design factors produce successful instruction in distance delivery? It is at this intersection of distance education and instructional development, then, that the present study was located.

As noted in Chapter I (p. 5), despite the increasingly broad range of distance delivery methods afforded by advanced communications systems and computer technology, print continues to be the principal means of conducting distance education (Marland & Store, 1982; Holmberg, 1989; Verduin & Clark, 1991; Martens, Valcke, Poelmans, & Daal, 1996; Andrewartha, 1996). In correspondence courses printed materials are usually the sole source of instruction. Alternatively, printed materials frequently are used as a supplement to instruction delivered by other, more
technologically advanced, means (Holmberg, 1989; Davis, 1990). The advantages of print as an educational medium have already been discussed. These advantages coupled with the flexibility of print seem to make the medium a logical choice to bridge the geographical gap between teacher and learner in distance education.

However, there are also certain drawbacks to print as an educational delivery medium. Chief among these is its restricted interactivity (Willis, 1994). Distance education is characterized by not only a geographic separation of teacher and learner but a transactional separation as well, based on Moore’s (1973) characterization of distance education as a transaction between teacher and learner. That transactional separation is exacerbated and dialogic transactions are severely impeded when print is the only medium of communication.

For this reason, print materials for distance education must be developed in such a way that these disadvantages are minimized or reversed. Thus there is a call for distance education print materials to be as interactive and as conversational as possible (Moore, 1986; Misanchuk, 1994; Chen, 1997). Since the development of print materials deeply involves the entire concept and process of instructional design and development, the review of the literature focused on those components.

Learning Theory and Instructional Development: An Overview

While it is beyond the scope of this paper to describe a detailed history of educational thought, a brief overview of the development of learning theory would be useful to understand its relationship to instructional development. Learning theory can be traced at least to the 7th century B.C. and was dominated by Greek educators and
philosophers. Gruber (1973) states, “In the three centuries between 600 and 300 B.C. the basis of Western philosophy was laid in Greece” (p. 15). The ideas of naturalism, idealism, pluralism, relativism, rationalism, skepticism, and stoicism were all advanced, each one with its advocates and critics. Further examination of several of these theories will reveal the roots of many modern Western learning theories.

Socrates developed a technique of teaching his students that became known as the Socratic dialogue, which revolved around a question-and-answer system leading to discovery of knowledge. Plato, Socrates’ leading student, developed a concept of learning dissociate from the senses and based on introspection, an early forerunner of metacognition. “Plato was a nativist because he felt knowledge was inborn. He was also a rationalist, because he felt this knowledge could only be made available through reasoning” (Hergenhahn, 1988, p. 32). In turn, Plato’s premier student, Aristotle, ultimately took an opposite view, maintaining that humans learn through both sensory experience and cognition. In conjunction with this theory, Aristotle developed his “laws of association,” wherein recall of one item elicits recall of related or associated items. Because of his emphasis on the senses, Aristotle’s theory is considered the forerunner of empiricism. Plato’s position dominated the world until the Renaissance, when Aristotle’s ideas were rediscovered.

From the 1500s to the late 1800s, Western learning theories remained rather polarized around Platonic idealism (Descartes, Kant) and Aristotelian empiricism (Hobbes, Locke, Hume), with frequent modifications and occasional attempts at compromise or amalgamation (Kant, Hume). From these theories, in turn influenced by
faculty psychology and evolutionism, arose three broad learning paradigms: the behaviorist (emphasizing the relationship between learning and behavior), the cognitive (emphasizing the relationship between learning and cognition), and the neurophysiological (emphasizing the relationship between learning and physiology).

Against this backdrop of developing learning theories and paradigms, distance education was born in the 19th century. Its purpose was to achieve an altruistic goal, the provision of equal access to education for all people. Further, the birth of distance education took place within what was traditionally an individualized approach to teaching and learning (Romiszowski, 1984). Thus the earliest and simplest forms of distance education (i.e., correspondence studies), presented the same pre-printed materials to all students while focusing on individual feedback and communication (albeit via postal system) with those students. It was an attempt to provide at a distance what traditional institutions provided in the classroom. Keegan’s (1986) theory of distance education revolves around artificially recreating the traditional classroom interaction between teacher and learner and inserting it into the delivery system. In order to achieve this, Keegan states, “learning materials, both print and non-print, are designed to achieve as many of the characteristics of interpersonal communication as possible” (p. 122). Holmberg (1986) agrees with Keegan’s theory that pre-produced printed materials can simulate interaction. This seems to be a strong and recurrent theme within the post-World War II distance education literature, and one that impacts distance education instructional development, as we shall note below.
Two additional important educational developments took place in the second half of the twentieth century. Programmed instruction, based on behaviorist approaches to learning, appeared on the scene as an outgrowth of World War II programs. B. F. Skinner began work in the 1950s with programmed instruction and the concept became widely accepted in the 1960s. Essentially, programmed instruction gives students “immediate reinforcement – the correct answer – after each of a series of small steps” (Verduin & Clark, 1991, p. 91). Romiszowski (1984) notes that this type of individualism constituted “self-paced individual study of prescribed material (usually common to all the students in a group)” (p. 5). Mastery learning, the second post-war development mentioned, grew out of the work of J. B. Carroll and Benjamin Bloom. In mastery learning, “students’ achievement is held constant and teaching methods, materials, and time available are sufficiently flexible so that practically all learners are able to achieve a high level” (Claxton & Murrell, 1987, p. 4). Both programmed instruction and mastery learning impacted distance education efforts in the second half of the 20th century.

Upon this educational landscape in the 1960s emerged the science of instructional design, also referred to as instructional systems design. Richey (1986) defines instructional design as follows: “the science of creating detailed specifications for the development, evaluation, and maintenance of situations which facilitate the learning of both large and small units of subject matter” (p. 9). This parallels Briggs’ (1977) definition referring to the “entire process of analysis of learning needs and goals and the development of a delivery system to meet the needs” (p. xx). Essentially, then, instructional design refers to the process by which an instructional problem is identified
and a solution devised. As applied to distance education, this would include the system
used to deliver the instruction.

As noted earlier, instructional design often follows a five-step procedure
involving analysis, design, development, implementation, and evaluation, or some
variation thereof. The third step, development, is the concept of concern for the present
study. Development has to do with the preparation of the instructional materials used to
resolve the educational problem identified. In other words, the materials are the crucial
means to the desired end, namely learning. In print-based distance education, this refers
to the printed materials and, more significantly, to how the content is arranged and
presented. This concept is what the principal investigator will refer to as instructional
development.

A body of literature has emerged linking instructional design and development
principles with distance education delivery. Much of the research takes the form of case
studies. It should be noted that confusion is often caused by the literature’s inconsistent
use of the terms instructional design and instructional development. As pointed out
above, instructional design refers to the entire multi-step process of problem
identification and resolution, while instructional development refers to the specific step of
developing, arranging, and producing instructional materials.

Specifically, in print-based distance education, instructional development refers to
the arrangement and presentation of content, textual considerations, inserted questions,
printed feedback, the use of graphic art, and other content and text-related features. These
kinds of features are sometimes referred to in the literature as embedded support devices,
a reference to the manner in which they are inserted, or embedded, in the content material. Embedded support devices in turn fall under the broad category mathemagenics, a term literally meaning “giving birth to learning.” Mathemagenic activities are those that “involve student action that is relevant to the achievement of specified instructional objectives” (Wolk & Svoboda, 1975, p. 2).

Research on mathemagenic activities is highly positive. For example, Felker (1974) and Frase (1967) found that question type and placement affected student learning from printed materials, Frase (1967) identified passage length of twenty lines as optimal for retention, and Brody and Legenza (1979) found that picture type and location increased learning. Martens, Portier, and Valcke (1995) compare interactive learning environments, printed materials, and traditional lectures, and states that mathemagenic activities are designed “to take over the supportive role of a teacher who is normally present during a lecture or a working group” (p. 1).

Research in the early 1990s, conducted largely at the Open University of the Netherlands (Valcke & Martens, 1992; Valcke, Martens, Poelmans, & Daal, 1993; Martens, Valcke, Poelmans, and Daal, 1996) concluded that the inclusion of embedded support devices in printed didactic materials was worthwhile. However, Valcke and Martens (1992) recommend further research on embedded support devices specifically within the distance education venue.

Strong links between educational theory and instructional design for distance education show up in the literature. Bååth (1976) describes five didactic functions based on a modification of Gagné's model of learning processes as applied to correspondence
education. Harley (1984) discusses the applicability to distance education of principles taken from Gagné's model of mastery learning, Rothkopf's model for printed instruction, Ausubel's model of advanced organizers, and Bruner's model for discovery learning. Other researchers (Wright & Conroy, 1988; Marland & Store, 1982) also link distance education instructional design to well-established educational theories, frequently citing Gagné and Briggs. Reflecting on the relationship between theory and design, Dick (1997) concludes, “The instructional design process, which is often represented in graphic models, is our theory” (p. 47).

Research also shows a strong tendency toward learner centered instructional design and development in distance education programs. In the context of learner-centered education, Sherry (1996) reviews the difference between the objectivist view, based on knowledge transmission via external symbolic representations, and the more recent constructivist view, based on internal knowledge constructs through individual interaction with the learning material. Similarly, using the APA's twelve learner-centered psychological principles, Wagner and McCombs (1995) overview the differences between traditional and learner-centered approaches to instruction and call for a constructivist view as an alternative to the objectivist approach which has dominated distance education instructional design. Others (Wolcott, 1996; Moore, 1987; Burbank & Pett, 1986) concur with learner centered, constructivist, or holistic models of instructional design for distance delivery methods. The contributors to Seels (1995) advocate an even stronger move toward constructivism in instructional design.
Therefore, the association between learning theory and instructional design and development, though complex, is established. The same association exists whether one refers to traditional education or to distance education. Hence, research in one area should maintain a degree of generalizability to the other.

Gagné’s Model and Global University’s Instructional Development

As mentioned earlier, Global University (GU) developed a somewhat hybrid package of undergraduate instructional development factors that is heavily based on Gagné’s “Nine Events of Instruction” model. It is hybrid in the sense that other educational theories are incorporated, but within the framework of Gagné’s model.

All Global University undergraduate courses follow the same pattern of lesson presentation. Each lesson begins with a two-page lesson organizer consisting of a lesson opener, lesson outline, lesson artwork, lesson objectives, learning activities, and a list of key words. Illustration 1 shows a lesson organizer from the GU course EDU3103 Principles of Teaching. The elements mentioned are easily identifiable in the illustration.

Each Global University lesson then follows a particular format in presenting the lesson content. In GU terminology, this is called the lesson development. Lesson development includes margin objectives, presentation of content in measured blocks of thought, the use of graphics, the use of distinctive typefaces, and study questions embedded in the text. Illustration 2 shows two pages of lesson development from the GU course EDU3103 Principles of Teaching. The elements mentioned can be seen in these pages.
LESSON 6

Knowing How to Communicate

"Take them away!" shouted the disciples as they pulled back the children. "The Master is too busy to be disturbed now!" Mothers with children clinging to their sides moved back a little but did not leave. Some saw the disciples trying to drive the children away and stopped them from doing so. Then He called the children to Him, they climbed into His lap happily, and He blessed them. The Master’s love was what attracted them to Him and made them enjoy His company, and He communicated that love to them through His attitude and His actions.

Words are the only way in which people communicate. We communicate through our facial expressions, gestures, and words. "Body language" also plays a role in our ability to communicate. Children who saw the performance spoke a language foreign to the children, but if you tell the children or their parents from the experts that the performance is not good, the children will think that it is not a good performance. This is what they understand during the performance: they caught that feeling. They understood all that he tried to say, though we usually did not speak a word. He successfully communicated with them through his personality, actions, expressions, and gestures.

Jesus taught the people about God’s power and love. He used words that they could understand and demonstrate the message by teaching the children. The children were happy to hear the message and happy to join in the discussion. He taught them to be happy, to respect others, and to have faith. The children gave the same responsibility to communicating God’s message as words and songs that people will understand. When you teach, think of what you say and how you say it because this can make all the difference between success and failure.

lesson objectives

1. Recognize how verbal and non-verbal communication affect the teaching-learning process.
2. Evaluate when teachers are communicating with their students through use of appropriate verbal and non-verbal language.
3. Identify the components that make up the process of communication.
4. Correctly apply the basic principles of good language use for classroom presentation.
5. Identify ways of using nonverbal and instructional language in the classroom.

learning activities

1. Work through the lesson development as usual. As you do the daily question, be sure to write down your own responses before looking ahead to see the answers we have given. Take the challenge when you have finished and check your answers.
2. Review Lessons 6-8 carefully; then take the Unit Program Evaluation. Follow the instructions on your student packet.
3. Observe other teachers and keep a notebook of good ideas you see for communicating with students according to the principle presented in this lesson.

key words

communication, interaction, dialogue, verbal, feedback, vocabulary

Illustration 1. Example of a Global University Lesson Organizer
Illustration 2. Example of a Global University Lesson Development

---

LANGUAGE FOR COMMUNICATION

In the last few chapters, we have discussed some of the basics of the classroom situation, and here we will focus on the three main components of the lesson: the teacher, the student, and the subject. We will examine the common factors that occur all three of these and make connections and relationship possible languages.

**Objective:** Identify phenomena which are particular of the use of verbal and nonverbal communication in teaching.

**Language of Communication**

Our dictionary defines language as a system of communicative symbols, whether made up of words, gestures, or facial expressions, or all visual signals. These words and movements are used to convey messages to others. The language we use is essential to effective communication. To study language, we must look at the way verbal and nonverbal communication work together. We must also understand the different communication styles used by various cultures and individuals.

<table>
<thead>
<tr>
<th><strong>TEACHER</strong></th>
<th><strong>STUDENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Teacher:</em></td>
<td><em>Student:</em></td>
</tr>
<tr>
<td>1. Written words</td>
<td>1. Spoken words</td>
</tr>
<tr>
<td>2. Teacher words</td>
<td>2. Student words</td>
</tr>
<tr>
<td>5. Gestures</td>
<td>5. Gestures</td>
</tr>
<tr>
<td>7. Distance</td>
<td>7. Distance</td>
</tr>
<tr>
<td>8. Signals, symbols, pictures</td>
<td>8. Signals, symbols, pictures</td>
</tr>
<tr>
<td>9. Rhythms, music</td>
<td>9. Rhythms, music</td>
</tr>
</tbody>
</table>

![Teaching and Communication Diagram](image)

---

How effective is your communication skills? How do you communicate with others? How can you improve your communication skills?

---

The effective use of language is crucial in communication. Many teachers prefer to use clear and direct language in order to create a more relaxed and informal atmosphere. Good teachers, whether writing or presenting, give an aura of confidence in their teaching, while changing topics, discussing effectively, or playing the role of a good teacher, they direct their thoughts right—whether you are in the front row or the back row. So it makes body
The third component of GU instructional development is the testing and evaluation vehicle. Parts of this are formative and parts are summative. Within the lesson development, there are study questions following each major thought. Model answers to these questions are given at the end of the lesson. Thus, the feedback is immediate and the student can check his or her answers with those given. At the end of each lesson is a self-test, a brief quiz over the lesson objectives. This is formative evaluation only, and students use this to check their learning of the lesson objectives. A Unit Progress Evaluation, or UPE, is given at the end of each Unit, with a Unit consisting usually of three related lessons. UPE’s are formative in nature, although some institutions that use GU courses consider UPE grades part of their summative evaluation.

A proctored final exam is given at the end of each course, and is summative in nature. In addition, the student is required to complete a course project (instructions are given in the packet of materials the student receives). Some courses are accompanied by an additional component called a Collateral Reading Assignment which requires the reading of an additional textbook and the writing of a paper comparing concepts from the textbook with those of the Global University study guide.

A complete list of Global University instructional development factors can be seen in Illustration 3. Here, the factors are grouped according to the order in which they appear in a lesson, and a brief description of each factor is given.

Global University operationalizes the Gagné model by a close, though not exact, correspondence of its instructional development factors with the nine events of instruction suggested by Gagné. The principal investigator compared the individual
<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Opener</td>
<td>An introduction to the lesson material, often an illustration or example. Often in the form of an Ausubelian advance organizer, relating the new material to existing knowledge</td>
</tr>
<tr>
<td>Lesson Outline</td>
<td>Two-level outline of major ideas in the lesson</td>
</tr>
<tr>
<td>Lesson Art</td>
<td>Artwork reflecting the lesson content, often relating directly to the Lesson Opener</td>
</tr>
<tr>
<td>Lesson Objectives</td>
<td>Broad but measurable objectives for the lesson</td>
</tr>
<tr>
<td>Learning Activities</td>
<td>Generic and some lesson-specific learning activities (outside readings, application activities, etc.)</td>
</tr>
<tr>
<td>Key Words and Glossary</td>
<td>Course-specific terms possibly unfamiliar to the student. Each term is used in context in the lesson, and defined in the course glossary.</td>
</tr>
<tr>
<td>Content Presentation</td>
<td>Content is presented in blocks of thought no longer than 1½ pages in length.</td>
</tr>
<tr>
<td>Margin Objectives (enabling objectives)</td>
<td>These relate directly to the blocks of thought presented, and are linked to the Lesson Objectives. They prepare the student to perform the Lesson Objectives.</td>
</tr>
<tr>
<td>Graphic Art</td>
<td>Tables, charts, graphs, maps, figures, and other representations that present difficult concepts in graphic form.</td>
</tr>
<tr>
<td>Typographical Features</td>
<td>Use of capital letters, boldface, italics, and different type sizes to direct student attention</td>
</tr>
<tr>
<td>Study Questions</td>
<td>After each block of thought, at least one Study Question is presented, requiring the student to demonstrate learning. Study Questions range from multiple-choice to essays.</td>
</tr>
<tr>
<td>Answers to Study Questions</td>
<td>Located at the back of each lesson, these provide model answers to the Study Questions located within the text</td>
</tr>
<tr>
<td>Self-tests</td>
<td>Placed at the end of each lesson, they test ability to meet the Lesson Objectives and Margin Objectives. Formative in nature.</td>
</tr>
<tr>
<td>Unit Progress Evaluations</td>
<td>UPEs are placed at the end of each Unit of study, usually 3-4 lessons, and test the Lesson Objectives. Made up of a combination of objective and subjective components.</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Taken at the end of the course, and covers the Lesson Objectives. Made up of a combination of objective and subjective components.</td>
</tr>
<tr>
<td>Course Project</td>
<td>A practical application or extension of the course material, projects take a variety of forms, depending on the course.</td>
</tr>
<tr>
<td>Collateral Reading Assignment</td>
<td>Requires the reading of an additional outside textbook and a lengthy writing assignment comparing textbook views.</td>
</tr>
</tbody>
</table>

Illustration 3. Global University Undergraduate Instructional Development Factors
<table>
<thead>
<tr>
<th>Gagné's Nine Events of Instruction</th>
<th>Global University Instructional Development factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Gain Attention</strong></td>
<td>Lesson Opener</td>
</tr>
<tr>
<td>Stimulus change. Appeal to student interests. Use demonstrations, video clips, other media presentations</td>
<td>Lesson Art</td>
</tr>
<tr>
<td></td>
<td>Lesson Outline</td>
</tr>
<tr>
<td><strong>2. Inform Learner of Objective</strong></td>
<td>Written Objectives (Lesson Objectives and Margin Objectives)</td>
</tr>
<tr>
<td>Indicate to the learner the kind of performance that will demonstrate learning</td>
<td></td>
</tr>
<tr>
<td><strong>3. Stimulate Recall of Prerequisite Learning</strong></td>
<td>Not done consistently or in easily identifiable manner. Sometimes included in Lesson Opener, sometimes in Lesson Presentation</td>
</tr>
<tr>
<td>Prerequisite learning is the component ideas for new concepts. This is often done by questioning.</td>
<td></td>
</tr>
<tr>
<td><strong>4. Present Stimulus Material</strong></td>
<td>Lesson Development in “blocks of thought”</td>
</tr>
<tr>
<td>Teach the lesson</td>
<td>Typographical Features</td>
</tr>
<tr>
<td></td>
<td>Graphic Art</td>
</tr>
<tr>
<td><strong>5. Provide Learning Guidance</strong></td>
<td>Not easily identifiable. Examples and elaboration are usually embedded in text, but this varies from course to course</td>
</tr>
<tr>
<td>“Lead” the student to correct learning. Makes use of examples in varied contexts, and elaborations.</td>
<td></td>
</tr>
<tr>
<td><strong>6. Elicit Performance</strong></td>
<td>Study Questions</td>
</tr>
<tr>
<td>Usually in the form of a question. The student demonstrates that learning has taken place.</td>
<td></td>
</tr>
<tr>
<td><strong>7. Provide Feedback</strong></td>
<td>Model Answers to Study Questions</td>
</tr>
<tr>
<td>Feedback is geared to the correctness or degree of correctness of student performance</td>
<td></td>
</tr>
<tr>
<td><strong>8. Assess Performance</strong></td>
<td>Self-test</td>
</tr>
<tr>
<td>Apply learning to new situations</td>
<td>Unit Progress Evaluations</td>
</tr>
<tr>
<td><strong>9. Enhance Retention and Transfer</strong></td>
<td>No systematic review per se, although self-tests and UPEs do seem to serve as reviews in preparation for the final exam)</td>
</tr>
<tr>
<td>Systematic reviews, often using a variety of new tasks to which the learning must be applied</td>
<td></td>
</tr>
</tbody>
</table>

Illustration 4. Correspondence of Global University Instructional Development (ID) Factors With Gagné’s Nine Events of Instruction Model
factors of GU instructional development with the Gagné model. Illustration 4 shows the correspondence of instructional development factors with the Gagné model. Identifiable, and therefore measurable, factors of GU instructional development appear in boldface type. From this comparison, the survey instrument was developed. Those factors that are not easily identifiable were not included in the study. A review of the literature related to the identifiable factors follows.

Research on Print-Related Instructional Development

It is established, then, that sound educational theory leads to sound instructional design, which in turn should include sound instructional development. Distance education is no different in principle. However, given the established nontraditional profile of the distance education student (see Gibson, 1998) and the nature of distance education itself, educators and institutions must pay increased attention to instructional development in courses delivered by distance methods. The question then arises: What does the research tell us regarding instructional development of print-based distance education materials?

A body of literature discussed instructional development factors as applied to printed educational materials in general, often making reference to their applicability to distance education printed materials. The literature referred both to general instructional development concepts as well as specific components or factors of instructional development. The specific factors mentioned most frequently were introductory material (including advance organizers), objective statements, content arrangement, typographical issues, graphics, embedded questions, answers to questions, and evaluation. A brief review of the literature related to each of these factors follows.
Factor One: Introductory Material

A number of researchers mention the importance of a set of introductory material at the beginning of a printed course, at the beginning of each module or lesson, or both. These materials prepare the learner for the instruction that follows either by capturing the students’ attention or introducing the organization of the lesson content to follow.

Wright and Conroy (1988) refer to introductory material, overviews (which sometimes function as advance organizers, which are examined below), and module organizers, which include “direction on how to work through the module; . . . and learning activities” (p. 88). They view these introductory and organizational materials as part of Gagné's Fifth Event of Instruction, that of guiding the learning.

Valcke et al. (1993) mention, among other items, introductions, structure pages, indexes, advance organizers, and schemes as ways of helping students prepare for the following instruction. Misanchuk (1994) mentions additional introductory materials that help the student prepare for learning, including overviews, course maps, orientation to course assignments, tests, grading procedures, and the use of icons. Marland and Store (1982) state that “writers . . . (should) use a combination of these devices” (p. 75).

Of the concepts included in introductory or orientating factors, that of advance organizers has been researched and reported rather thoroughly. David Ausubel introduced his concept of advance organizers in the early 1960s (Ausubel, 1960, 1963). The idea generated considerable debate (see Ausubel, 1978).

Essentially advance organizers are a method of introducing new material to a learner prior to lesson presentation. Marland and Store (1982) state that advance
organizers provide learners with a “conceptual framework for facilitating learning and retention of the new material” (p. 76). Ausubel (1978) explains that advance organizers are written “at a higher level of abstraction, generality, and inclusiveness than the learning passage itself” (p. 252). Ausubel divides advance organizers into two types: expository organizers, used in advance of completely unfamiliar material, and comparative organizers, used in advance of material that may be somewhat familiar (Ausubel, 1978).

Marland and Store (1982) give an overview of research on advance organizers. The general conclusion of the research is positive. For example, Mayer (1979) concludes that “advance organizers, when used in appropriate situations and when evaluated adequately, do appear to influence the outcome of learning” (p. 381). Luiten, Ames, and Ackerson (1980), whose meta-analysis was the most comprehensive to that date, conclude that advance organizers exert a “small but facilitative effect on learning and retention” (p. 217). Some (Harley, 1984; Marland & Store, 1982) mention the applicability of advance organizers specifically to distance education.

While the literature in general does not refer much to the event of “gaining attention,” introductory material such as reviewed above certainly falls into that category. Depending on how introductory material is presented, student attention may be caught or lost. As Gagné (1988) correctly states, “Skill at gaining attention is a part of the teacher’s art” (p. 183). This is true whether the teaching takes place in the traditional classroom setting or via distance delivery methods, such as printed study guides.
Factor Two: Stated Objectives

The idea of written or stated learning objectives appears to be fundamental to all education and is a component of even the earliest models and theories of instruction and learning. Their primary intended function is to give direction to instruction, acting as a target, so to speak, for both teacher and learner. Wager (1975) states that without stated objectives, “there is no sound basis for the selection or designing of instructional materials, content, or methods” (p. 5). Learning assessment is also rendered impossible unless linked to stated objectives. Gagné et al. (1988) build their entire system of instructional design around performance objectives. Reigeluth (1987) examines eight instructional theories and models to see how each would approach the same stated objectives.

While the definitions of the terms goal and objective are similar and are linked in the best theories, the essential difference, without belaboring the point, is that goals are broad statements of desired outcomes while objectives are detailed, more specific statements that include wording that make them much more measurable. Objectives are steps toward goal-accomplishment (Gagné et al., 1988). To make more sense of the interrelationship of goals and objectives, Gagné and Merrill (1990) address the issue of integrative goals, which, they believe, “do not supplant single objectives such as labels, facts, concepts, and roles; rather they incorporate them” (p. 29).

Interestingly, Marland and Store (1982), in a review of research on instructional objectives, report unconvincing results. That is to say that designers’ and teachers' intent in using objectives as targets or foci for instruction is not clearly accomplished. Their
research finds that students seem to use objectives as “access devices,” providing (them) with different points-of-entry to the instructional material, and allowing them to chart their own ways through it” (p. 87). However, they also conclude that intentional learning is positively affected by the use of stated objectives.

Factor Three: Content Presentation

A large body of literature emerges addressing the issue of content presentation in distance education materials. Another way to describe this idea is the “pacing” of the material presented, the “amount” of material presented before the occurrence of some sort of break in the presentation (often a question, activity, or review).

Bååth (1976) found that material presentation was an important factor in making distance education printed materials as widely acceptable as possible. Smaldino (1998) notes a trend to “reduce the 'amount' of information delivered and to increase the 'interactive value' of the learning experience” (p. 11). She recommends maintaining only the most essential elements of content that will ensure student success in reaching the course objectives.

Several (Wright & Conroy, 1988; Keller & Burkman, 1993) mention the need to limit content presentation to short, manageable blocks of text to optimize comprehension and increase concentration. El-Hmaisat (1989) concurs, adding the necessity of immediate feedback following each small chunk of content presented.

Glynn and Britton (1984) summarize the importance of the presentation of content by referring to the highly complex and demanding cognitive task learners must perform to understand printed instructional text. A number of simultaneous processes
“compete for limited space in readers’ working memories” (p. 43). Attention to content presentation, or pacing, it is implied, will help the distance education student better manage the overall cognitive task.

Factor Four: Typographical Design

This factor falls under the general heading of content presentation, but the literature is reviewed here separately. A rather large body of research has been done on the effects of typographical design (also referred to as textual design) on learners and learning. Typographical design issues include such items as type size and font, paper size, margins, the use of white space, and the insertion of typographical cues such as boldface, capitals, underlines, and italics. Andrewartha (1996) examined the literature on typographical design specifically to produce recommendations for the writing of distance education study guides.

The area involves so many details that it would be best to extract only the basic guidelines. Several guiding andragogic principles in typographical design emerge in the literature. Chief among these are the ideas that typographical design must lead to content clarity, must enhance and enrich the learning process, and must motivate the learner (Andrewartha, 1996). Marland and Store (1982) summarize the consideration of typographical design into two general areas: attractive design, which motivates students, and educational consequences, which affect learning. Others (Misanchuk, 1994; Keller & Burkman, 1993) agree that typographical considerations can act as motivational tools.
Factor Five: Graphic Art

This factor also falls under the general heading of content presentation, but the literature is reviewed here separately. Graphic art, or graphics, refers to all kinds of non-verbal illustrations, including such items as tables, graphs, charts, diagrams, and maps. The general purpose of graphic art in printed materials is to present information in an alternative, more concrete or visual form than pure text, the idea being that learners will comprehend the information more readily through the additional representation.

Some, like Wagner (1995), merely mention graphics briefly in a list of effective instructional development items. Others, like Duchastel (1981), report the central importance of the concept. Smaldino (1998) notes that graphics or visuals “make it easier to understand complex ideas, . . . serve as mnemonics (that) can assist student understanding, . . . and . . . help students to prepare for tests and other means of assessing their learning” (p. 11). Marland and Store (1982) formulate a detailed composite list of best practice suggested by the research.

Factor Six: Inserted Questions

As Marland and Store (1982) note, inserting study questions within the content presentation has been a general practice in instruction for decades. Duchastel and Whitehead (1980) lament the small amount of research done on learner use of inserted questions, but, nonetheless, report that “a great number of students attach some importance to in-text questions” (p. 41). Wright and Conroy (1988) distinguish between embedded questions and learning activities, though their description of learning activities centers heavily on questions, both objective- and essay-types. Marland et al. (1990) found
little student use of “in-text activities” (p. 85), which included questions and other kinds of material-engaging activities. Hashim (1999) classifies in-text questions or exercises under the broad rubric of learning activities, and states that the purpose of such activities is to “motivate learners and encourage learner interaction with teacher, learner, and learning materials” (p. 344). Yule (1985) similarly states that “the main point is that the questions are inserted in order to involve the student actively” (p. 316) as well as to pace the student.

Factor Seven: Model Answers

Model answers, in distance education printed materials, are often given at the end of individual lessons or listed in a separate student packet of some kind. Such readily available answers serve as immediate feedback for the student (Madhumita & Kumar, 1995), and seem to be considered by many as a form of interaction between learner and teacher. Wright and Conroy (1988) note that positive feedback coupled with each model answer functions as behavioral reinforcement for learning.

Factor Eight: Testing and Measurement

An enormous amount of literature has been written concerning testing and measurement as a part of the educational process. Only the basics will be considered here.

Essentially, the acknowledged purpose of testing or evaluation is to “determine the extent to which the teaching and learning objectives have been reached” (Hegarty, Phelan, & Kilbride, 1998, p. 104). Verduin and Clark (1991) agree with this focus on measurement of objectives attainment. Others focus on the aim of testing to assess quality
of education. Thus Popham (1988) refers to testing as the “formal appraisal of the quality of educational phenomena” (p. 7). Angelo and Cross (1993) focus more altruistically on the common goal of all higher education institutions of producing “the highest possible quality of student learning” (p. 3), and feel that testing is one way of assuring that quality.

Testing can be formative (testing done during the actual learning experience, and usually not considered part of a final grade) or summative (testing done at the end of the learning experience, and usually considered all or part of a final grade). Testing, especially formative testing, also plays a feedback role by informing the learner of progress made toward course objectives. An additional function of testing may be as repetition or review of learned material. Reynolds and Glaser (1964) note that most existing learning theories “assume that the strength of learning . . . varies as a function of the number of practice repetitions” (p. 297). Thus formative testing may fill a review role for students as they prepare for the summative testing on which passing a course to a great extent depends.

Instructional Development and Student Success

By describing the link between sound learning theory and instructional development factors, the literature addressed thus far acknowledges the established importance of these factors, particularly in distance education printed materials. It remains to be seen, however, how distance students perceive the association between instructional development factors and their own successful achievement in distance courses.
Much has been written identifying personality traits and demographic characteristics of distance education students (the so-called “distance education student profile”) and linking these characteristics with student success (Thompson, 1998; Gibson, 1998; Willis, 1993; Verduin & Clark, 1991). Far less information exists about how instructional development is related to student success. This seems remarkable since student success (as usually measured in course final grade, satisfaction with the delivery method, and/or willingness to study further distance education courses) is not only important in and of itself, it is a crucial factor in course evaluation and revision, steps in the instructional design process. Given the earlier review of the literature linking instructional design and development to educational theory, one would expect to find a similar body of literature studying the association between instructional development factors and student achievement. This is not the case, however. Little research has been conducted in which students are asked to assess the individual elements of instructional development in specific distance education printed materials.

Much of the assessment literature revolves around student evaluations of either the instructor and his/her qualities or effectiveness or of the technology used to deliver the instruction. And while much of what appears in the literature is cast as achievement-enhancing factors, much of the literature is anecdotal. This might be expected, given the theoretical parameters already mentioned. There seems to be an obvious gap in the literature of type I evaluative research in which a particular system's courses are evaluated from the students' standpoint.
Chacon (1985) performed one of the more comprehensive studies in this area. He describes specific instructional development factors and their relationship to learning theory. However, his questionnaire only asks students in the sample to define their satisfaction or dissatisfaction with the factors. It does not ask the students in the sample to identify their perceptions of whether and how well the individual instructional development factors contributed to their success in the course nor did it ask them to rank the factors from their own perspective. Thus, the association between instructional development factors and student achievement or success remains undefined.

Marland, Patching, Putt, and Putt (1990) investigated student use of text-processing strategies and textual features. In-text stimuli, including textual features, objectives and other organizers, typographical features, word usage, activities, and graphics were studied from a student-use perspective. The results were unconvincing, presenting a “decidedly unflattering” picture (p. 88), leaving one questioning the traditionally accepted effectiveness of the very factors mentioned earlier. Their recommendations reflect a revisionist perspective resulting from their research findings. Others (St. Pierre & Olsen, 1991) simply mention the need for quality and understandable educational materials for student success. Persistence in the distance education format, and dropout rates (vs. completion rates) are other criteria that surface infrequently in the literature. The obvious gap is in research that allows the students themselves to relate instructional development elements to their own success and achievement in distance education courses. The current research project is a beginning to fill that void in the literature.
CHAPTER III
PROCEDURES FOR THE COLLECTION AND ANALYSIS OF DATA

Introduction

Chapter 1 lists five purposes of the present study. These may be combined under two general headings: primary and secondary purpose. The primary purpose of this study was to determine student perceptions of the facilitative nature of selected instructional development factors in distance education materials published by Global University (GU). Multiple secondary purposes of this study were to compare student perceptions of the facilitative nature of selected instructional development factors based on gender, age, ethnic background, and familiarity with the program. The elements of instructional development that participants were asked to rank are those implemented by Global University in that institution's print-based baccalaureate degree courses.

Research Design

The research design involved a questionnaire, implying a non-experimental design, survey methodology. Since the study was institution-specific (the instructional development under investigation is peculiar to the institution, and the sample was taken from a population also peculiar to the institution), a questionnaire was developed specifically for the study. The development of that questionnaire is discussed in detail later in this chapter.

The questionnaire consisted of four parts: 1) a demographic data section, 2) a Likert-scale table for evaluating instructional development elements according to the
student’s perceived effectiveness of each element, 3) an ordinal table for ranking
instructional development elements in order of their student-perceived effectiveness in
relation to other elements, and 4) a space for open-ended comments. The mailed survey
collected data on student-perceived importance rankings of elements of instructional
development in Global University undergraduate degree-level distance education printed
study guides. The sample was taken from Global University students who had completed
at least one print-based course from that institution.

The mailed questionnaire method was selected primarily for two reasons. First,
the sample of respondents was spread over the entire United States and the cost of
interviews, either by telephone or face-to-face, would have been prohibitive, while the
response time for mail surveys is normally lower than that for personal interviews.
Secondly, the kinds of data collected for this research did not require the use of any of the
other research methods, such as testing, interviews, or observation (Gall, Borg, & Gall,
1996). The questionnaire method, with its attendant advantages, lent itself well to the
present survey-based study.

An acknowledged disadvantage of the mailed questionnaire is sample participant
non-response. To minimize this, a system of three follow-ups was used to contact non-
respondents. An initial mailing included a cover letter along with the questionnaire and a
self-addressed stamped return envelope. Three days after the time limit expired, a first
follow-up letter was sent to non-respondents, along with an additional copy of the
questionnaire and another self-addressed stamped return envelope. One week after the
first follow-up, a post-card reminder was sent to non-respondents. Depending on the
percentage of respondents from the original sample, an additional letter will be sent out to non-respondents one week after the post card follow up. This is a modification based on the follow-up approaches suggested by Gall, et al. (1996) and Cresswell (1994).

Population Description

For the purposes of this study, the population consisted of all individuals who met the following criteria:

1) Were actively studying with Global University, or had been inactive in their Global University studies for less than one year. This insured that familiarity with Global University instructional development was current or relatively recent in the student's mind

2) Were studying Global University undergraduate courses only. Other Global University study levels use different systems of instructional development. We did not want to sample students who were studying under two or more distinct systems of instructional material development. Other institutions, regardless of surface similarities, would not necessarily subscribe to the same approach to instructional development as Global University. Therefore, students studying with two or more different institutions at the same time were disqualified from inclusion in the results.

3) Were studying through print delivery only. This insured that student-perceived importance rankings were performed only on the printed materials, not on videotapes, audiotapes, or any other technological delivery methods. It was
important that the study be performed on prose, the typical writing style of the
majority of print study guides used in correspondence education.

4) Were studying individually, neither in an institutional setting (with a
classroom professor or facilitator) nor in a small group setting. This insured
that the student did not receive any learning helps other than those embedded
in the Global University printed materials themselves.

5) Were American citizens. This increased the probability that participants had
entered their Global University studies familiar with a western (more
specifically, North American) approach to education.

A list of all current and inactive Global University undergraduate students who
are American citizens is maintained in the databases of Global University Student
Services. Release of that list of names and addresses was obtained from Gary Seevers,
Global University Associate Dean for Academic Affairs, under whose purview falls
responsibility for institutional research and development.

Since this study was of benefit to the institution itself, and because participant
anonymity and confidentiality of data were assured by the principal investigator, release
of student names and address for research purposes complied with the regulations
stipulated by the Family Educational Rights and Privacy Act (FERPA), to which Global
University subscribes. (FERPA guidelines are included in the 2000 Global University
catalog, page 24.) The list of student names was sorted so that only currently active
students and students who had been inactive for less than one year were included in the
population.
Sample Selection

For the purposes of this study, sample size was determined by the total number of students who met the requirements for population inclusion. The offices of Student Services provided a database of 2169 students who met these requirements. Of these, 34 names (1.6% of the original database) were deleted due to corrupt data (incomplete or missing addresses). The remaining 2135 names formed the population for the study. This population was arranged alphabetically by last name.

Randomization was accomplished through the use of a table of random numbers. The table found in Leedy (1993, p. 203) was used. Entry point 1, 6 was determined by chance (first two digits on a dollar bill), and determination of horizontal and vertical points was determined by coin toss.

Adequate sample size was elected to be 10% of the population, or 214. A response rate of 65 per cent was considered adequate for this study. It was understood that non-responsiveness reduced sample randomness, and that the higher the response rate the more valid the sample would be. Because of this phenomenon, then, the pool of actual responses constituted a convenience, or availability, sample.

Instrumentation

Because the research is institution-specific, no existing instrument was found to be appropriate for the study. Therefore, an instrument particular to the study was developed. This was accomplished through a process of draft, pilot test, and revision. A rough draft of the questionnaire was developed in February 1999 and pilot-tested with a group of thirty national directors attending a leadership conference at the former offices.
of the institution in Irving, Texas. Their responses and qualitative comments were used to revise the wording of questions. The revised questionnaire was reviewed by the principal investigator's doctoral committee, and by Gary Seevers, Associate Vice President of Academic Affairs for Global University. The review insured that the instrument yielded the kinds of information necessary for the successful completion of the study. Both the sampling procedure and the questionnaire were coded to maintain student anonymity and to control follow-up mailings in order to reach the necessary response rate.

The questionnaire consisted of four parts. Part 1 identified demographic information. Participants were asked to identify their gender, age, ethnic background, number of Global University courses completed, and currency of familiarity with Global University courses.

Part 2 consisted of a table labeled Evaluation of Global University Instructional Development Factors. This table contained a list of eleven statements concerning identifiable factors, or elements, of Global University undergraduate instructional development, accompanied by a Likert scale. Participants were asked to rate these factors according to each factor’s importance to the student’s successful completion of Global University courses. The Likert scale permitted responses of “Strongly Agree – Agree – Neutral or No Opinion – Disagree – Strongly Disagree.”

Part 3 consisted of a table labeled Ranking of Global University Instructional Development Factors. This table contained a list of the same eleven instructional development factors and asked the participant to rank all eleven factors against one
another, with 1 representing the element perceived to be the most helpful in the participant’s success and 11 representing the least helpful.

Part 4 allowed the student to make and qualitative statements or comments about the instructional development of ICI courses. These statements were examined separately from the information obtained from parts 2 and 3.

Data Collection Procedures

Approval for the study was obtained from the University of North Texas (UNT) Institutional Relations Board. Approval was also solicited from Gary Seevers, Global University Associate Vice President of Academic Affairs and responsible for institutional research and evaluation. Global University agreed to support and fund the research project by 1) providing the paper and professional copy machines necessary to produce the questionnaires, 2) permitting the cover letter accompanying the questionnaire to be printed on Global University letterhead, 3) permitting the mailings to be sent in Global University envelopes, and 4) funding the total cost of the mailings. In return for support and funding, Global University asked that bound and electronic copies of the final dissertation be given to the institution for future reference. The principal investigator agreed to these terms.

The four-step process for mailing of questionnaires and follow-up contacts already briefly described was used. Four mailings were employed in this study. Mailing No. 1 was sent out on October 4, 2000 to the population sample. This mailing consisted of a cover letter, The UNT informed consent protocol, the questionnaire, and a stamped
self-addressed return envelope. Response target date was set at October 20, 2000, allowing 16 days for mail delivery each way and questionnaire completion.

The first follow-up mailing was sent out on October 24, 2000 to non-respondents, and consisted of a follow-up cover letter, the UNT informed consent protocol, a copy of the questionnaire, and a stamped self-addressed return envelope. Response target date was set at November 13, 2000, allowing 20 days for mail delivery and questionnaire completion. The second follow-up mailing was sent out on November 16, 2000 to remaining non-respondents, and consisted of a cover letter, an additional copy of the questionnaire, an additional copy of the informed consent protocol, and a stamped self-addressed return envelope. A cut-off date of a December 1, 2000 postmark was elected.

Data Analysis

A response rate of 71.3 per cent was achieved. 6 surveys were returned as undeliverable, 4 were returned unused, and 3 were returned by students who did not wish to participate in the survey. These returned items were replaced using the table of random numbers, thus constituting sampling with replacement. A total of 152 usable questionnaires was returned. Total N for Ethnic Background varies (N = 151) because of one unidentifiable ethnic classification.

The analyses of data were performed using the Statistical Package for the Social Sciences (SPSS) Version 10.0. Data were analyzed for descriptive purposes. All statistical tests were performed at the 0.05 level of probability. Significant chi-square values indicated that the observed distribution of responses departed significantly from the distribution expected under the condition of the hypothesis of no differences between
the observed and expected distributions. Each data stratification set (age, gender, ethnic background, and two methods of examining time in program) was analyzed to produce a profile of student perceptions of the facilitative nature of the instructional development factors. These profiles were then compared.
CHAPTER IV
PRESENTATION OF FINDINGS

Introduction

The purposes of this study were to: 1) solicit student perceptions of the facilitative nature of selected instructional development factors in distance education materials published by Global University, and 2) to identify differences in those perceptions according to gender, age, ethnicity, and familiarity with the particular instructional development program used by Global University. A mailed questionnaire was used to collect data from a sample of 213 students in the United States enrolled in Global University undergraduate distance education courses or programs. A total of 152 questionnaires was returned, representing a 71.3 percent response rate.

This chapter presents the data and reports the results of the statistical analysis conducted according to the four research questions specified in Chapter I. All statistical analyses were performed at the .05 level of probability. The results are presented under 13 main sections: (1) student demographic data, (2) lesson opener data, (3) lesson artwork data, (4) lesson outline data, (5) written objectives data, (6) information/question data, (7) typographical data, (8) graphic art data, (9) study question data, (10) answers to study questions data, (11) self-test data, (12) UPE (Unit Progress Evaluation) data, and (13) additional comments data.
The Questionnaire

The questionnaire was divided into four sections. The questions in section one titled “Demographic Data” were designed to collect demographic information regarding gender, age, ethnic background, number of courses completed with Global University, and how current or recent the respondent’s studies were. Section two, “Evaluation of Global University Instructional Development Factors,” contained statements regarding 11 factors of instructional development. The response categories were presented in a Likert scale labeled “Strongly Agree,” “Agree,” “Neutral (neither agree nor disagree),” “Disagree,” and “Strongly Disagree.” Section three, titled “Ranking of Global University Instructional Development Factors,” contained a rank-order scale on which respondents were to rank the same 11 instructional development factors in order of each one’s perceived facilitative nature in respondent course success. Thus, respondents were asked to label the factors from 1 to 11, with 1 representing the most helpful factor and 11 representing the least helpful factor. The fourth and final section titled “Additional Comments” contained space for respondent qualitative comments regarding any of the questions in the second and third sections of the questionnaire.

Section One: Demographic Data

In an effort to describe the kinds of students who study through Global University and to provide the independent variables on which the study relied, specific and limited demographic data were gathered. Five questions were asked in this section. The data for each statement are presented in the following subsections. The characteristics of the respondents are summarized in Table 1.
Table 1. Demographic Data of Survey Respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>101</td>
<td>66.4</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>33.6</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 16.447*; df = 1

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>29.6</td>
</tr>
<tr>
<td>30-39</td>
<td>50</td>
<td>32.9</td>
</tr>
<tr>
<td>40-49</td>
<td>43</td>
<td>28.3</td>
</tr>
<tr>
<td>50 or over</td>
<td>14</td>
<td>9.2</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 20.895*; df = 3

<table>
<thead>
<tr>
<th>Ethnic Background</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Indian</td>
<td>6</td>
<td>3.9</td>
</tr>
<tr>
<td>Caucasian</td>
<td>124</td>
<td>81.6</td>
</tr>
<tr>
<td>Asian</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>7.9</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 468.430*; df = 5

<table>
<thead>
<tr>
<th>Courses Completed</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 or more</td>
<td>49</td>
<td>32.2</td>
</tr>
<tr>
<td>1-4</td>
<td>59</td>
<td>38.8</td>
</tr>
<tr>
<td>Enrolled in first course</td>
<td>44</td>
<td>28.9</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 2.303NS; df = 2

<table>
<thead>
<tr>
<th>Last time studied with Global University</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently studying at least one course</td>
<td>128</td>
<td>84.2</td>
</tr>
<tr>
<td>Within past 12 months</td>
<td>21</td>
<td>13.8</td>
</tr>
<tr>
<td>Over a year ago</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 180.250*; df = 2
Of the 152 participants responding to the item regarding gender, 51 (33.6 percent) were female and 101, or 66.4 percent, were male. Theoretically, the expected distribution of gender would be 50.0 percent male and 50.0 percent female. The actual distribution departs significantly from the expected distribution, thereby indicating that the observed distribution cannot be attributed to chance.

Of the 152 participants responding to the item regarding age, 29.6 percent were in the under 30-year-old range, nearly one-third were in the 30-39 year-old range, and 28.3 percent were in the 40-49 year-old range. 14 respondents (9.2 percent) were in the 50 or Over year-old range. Theoretically, the expected distribution of age would be 25.0 percent for each of the four ranges. The actual distribution departs significantly from the expected distribution, thereby indicating that the observed distribution cannot be attributed to chance.

Of the 151 participants responding to the item regarding ethnicity, the majority (N = 124, or 81.6 percent) were Caucasian. This is followed by 12 participants (7.9 percent) who identified themselves as Hispanic, 6 (3.9 percent) who identified themselves as American Indian, 5 (3.3 percent) who identified themselves as Black, 2 (1.3 percent) who identified themselves as Asian. Two respondents (1.3 percent) identified themselves as “other.” The expected distribution of 16.6 percent was for each of the six categories. The lack of goodness-of-fit between the two distributions departs significantly from the expected distribution, thereby indicating that the observed distribution cannot be attributed to chance.
Of the 152 participants responding to the item regarding the number of Global University courses completed to date, 49 (32.2 percent) had completed 5 or more courses, 59 (38.8 percent) indicated they had completed 1-4 courses, and 44 (28.9 percent) were enrolled in their first course. For this item, the calculated chi-square value is not significant.

Of the 152 participants responding to the item regarding recency of study, 128 (84.2 percent) indicated they were currently studying at least one course; 21 (13.8 percent) indicated they were not currently studying but had studied within the previous 12 months. In addition, 3 respondents (2.0 percent) indicated they had last studied over a year ago. Theoretically, a statistical distribution of recency of study could be expected at 33.3 percent for each of the three categories. The lack of goodness-of-fit between the two distributions departs significantly from the expected distribution, thereby indicating that the observed distribution cannot be attributed to chance.

Note: The number of respondents identifying themselves as “Asian” was 2. The number of respondents identifying themselves as “Other” was also 2. A chi-square test on 2 respondents on a scale such as the 5-category Likert scale used in Part 2 of the instrument used in this study will produce a calculated chi-square value of 0.000 if both respondents answer the question. Alternatively, the chi-square test will not be applicable if either or both respondents do not reply to the question. (A chi-square test cannot be applied to a constant or to a no-response.) Similarly, a chi-square test on 2 respondents within a scale such as the 11-category rank-order scale used in Part 3 of the instrument used in this study will produce a calculated chi-square value of 0.000 if both respondents
answer the question. Alternatively, the chi-square test will not be applicable if either or both respondents do not reply to the question. Therefore, in “Ethnic Background” data presented in subsequent sections of this study, both in Likert-scale data and in rank-order data, the two categories “Asian” and “Other” were neither examined nor presented.

In addition, the number of respondents who identified themselves as having last studied over 1 year ago was 3. A chi-square test on 3 respondents on a scale such as the 5-category Likert scale used in Part 2 of the instrument used in this study will produce a maximum calculated chi-square value of 0.333 if all respondents answer the question. Similarly, a chi-square test on 3 respondents within a scale such as the 11-category rank-order scale used in Part 3 of the instrument used in this study will produce a calculated chi-square value of 0.000 even if all respondents answer the question. A calculated chi-square value of 0.333 is not significant at the .05 level of probability even with 1 degree of freedom. Therefore, in “Recency of Study” data presented in subsequent sections of this study, both in Likert-scale data and in rank-order data, the category “Over 1 Year Ago” was neither examined nor presented.

Section Two: Lesson Opener Data

For Question 6, respondents were to locate on a Likert scale their perception of the helpfulness of lesson openers in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 2 – 7.
Table 2. Responses of Participants to Question 6: Lesson openers helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>26</td>
<td>17.2</td>
</tr>
<tr>
<td>Agree</td>
<td>94</td>
<td>62.3</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>28</td>
<td>18.5</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>151</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 190.093*; \ df = 4 \]

In the chi-square goodness-of-fit test reported in Table 2, a theoretical distribution of expected frequency of 30.2 per response category was used for comparison purposes. With 4 degrees of freedom, a critical chi-square value of 7.815 was required for significance at the .05 level of probability (Hinkle, Wiersma, & Jurs, 1998). Of the 151 respondents to question 6, 26 (17.2 percent) strongly agreed that lesson openers helped them succeed in their courses, while slightly less than two-thirds (62.3 percent) agreed that lesson openers were helpful. In addition, 28 respondents (18.5 percent) were neutral, while 2 (1.3 percent) disagreed that lesson openers were helpful and 1 (0.7 percent) strongly disagreed. The observed chi-square value of 190.093 indicates that the observed distribution of responses in Table 2 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 3. Responses by gender to Question 6: Lesson openers helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>100</td>
<td>16 (16.0%)</td>
<td>67 (67.0%)</td>
<td>15 (15.0%)</td>
<td>2 (2.0%)</td>
<td>0 (0.0%)</td>
<td>98.960*; df=3</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>10 (19.6%)</td>
<td>27 (52.9%)</td>
<td>13 (25.5%)</td>
<td>0 (0.0%)</td>
<td>1 (2.0%)</td>
<td>27.353*; df=3</td>
</tr>
</tbody>
</table>

66
Of the male respondents, 16.0 percent strongly agreed that lesson openers helped them succeed in their courses. Slightly more than two-thirds (67.0 percent) agreed. 15.0 percent were neutral and 2 (2.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant and indicates that the observed distribution of responses departs significantly from the distribution expected under the condition of the hypothesis of no differences between the observed and expected distributions.

Of the female respondents, 19.6 percent strongly agreed that lesson openers helped them succeed in their courses. Slightly more than one-half (52.9 percent) agreed. Slightly more than one-fourth (25.5 percent) were neutral. None disagreed and 1 (2.0 percent) strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both genders are significant. This indicates that the observed distribution of responses in Table 3 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 4. Responses by age to Question 6: Lesson openers helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>10 (22.2%)</td>
<td>24 (53.3%)</td>
<td>9 (20.0%)</td>
<td>1 (2.2%)</td>
<td>1 (2.2%)</td>
<td>39.333*; df=4</td>
</tr>
<tr>
<td>30-39</td>
<td>50</td>
<td>6 (12.0%)</td>
<td>34 (68.0%)</td>
<td>10 (20.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>27.520*; df=2</td>
</tr>
<tr>
<td>40-49</td>
<td>42</td>
<td>6 (14.3%)</td>
<td>29 (69.0%)</td>
<td>6 (14.3%)</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>45.048*; df=3</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>4 (28.6%)</td>
<td>7 (50.0%)</td>
<td>3 (21.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1.857NS; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 age group, 10 (22.2 percent) strongly agreed that lesson openers helped them succeed in their courses. Another 24 (53.3 percent) agreed. 9 (20.0 percent) were neutral. The disagree and strongly disagree categories had
equal numbers of 2 respondents (4.4 percent) each. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, 6 (12.0 percent) strongly agreed that lesson openers helped them succeed in their courses. Another 34 (68.0 percent) agreed. 10 (20.0 percent) were neutral. None disagreed or strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 6 (14.3 percent) strongly agreed that lesson openers helped them succeed in their courses. Another 29 (69.0 percent) agreed. 6 (14.3 percent) were neutral and 1 respondent (2.4 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, 4 (28.6 percent) strongly agreed that lesson openers helped them succeed in their courses. Another 7 (50.0 percent) agreed. 3 (21.4 percent) were neutral. None chose either of the disagree options. The calculated chi-square value is not significant.

The chi-square tests are significant for all age groups except the 50 or Over group. This indicates that for these three groups the observed distribution of responses in Table 4 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

**Table 5. Responses by ethnic background to Question 6: Lesson openers helped me succeed in the courses.**

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>1 (16.7%)</td>
<td>5 (83.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>2.667NS;df=1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>123</td>
<td>20 (16.3%)</td>
<td>75 (61.0%)</td>
<td>26 (21.1%)</td>
<td>1 (0.8%)</td>
<td>1 (0.8%)</td>
<td>149.480*;df=4</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>1 (20.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1.600NS;df=2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>1 (8.3%)</td>
<td>11 (91.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>8.333*;df=1</td>
</tr>
</tbody>
</table>
Of the American Indian respondents, 1 (16.7 percent) strongly agreed that lesson openers helped them succeed in their courses. Another 5 (83.3 percent) agreed. None chose neutral or either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, 20 (16.3 percent) strongly agreed that lesson openers helped them succeed in their courses. Another 75 (61.0 percent) agreed. 26 (21.1 percent) were neutral, 1 (0.8 percent) disagreed, and 1 (0.8 percent) strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents 3 (60.0 percent) strongly agreed that lesson openers helped them succeed in their courses. Another 1 (20.0 percent) agreed. 1 (20.0 percent) chose the neutral option. None disagreed or strongly disagreed. The calculated chi-square value is not significant.

Of the Hispanic respondents, 1 (8.3 percent) strongly agreed that lesson openers helped them succeed in their courses. Another 11 (91.7 percent) agreed. None chose the neutral or either of the disagree options. The calculated chi-square value is significant.

Only the chi-square tests for the Caucasian and Hispanic groups are significant. This indicates that for those two groups, the observed distribution of responses in Table 5 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 6. Responses by number of courses completed to Question 6: Lesson openers helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>=&gt;5</td>
<td>49</td>
<td>9 (18.4%)</td>
<td>33 (67.3%)</td>
<td>7 (14.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>25.633*; df=2</td>
</tr>
<tr>
<td>1-4</td>
<td>58</td>
<td>10 (17.2%)</td>
<td>34 (58.6%)</td>
<td>13 (22.4%)</td>
<td>1 (1.7%)</td>
<td>0 (0.0%)</td>
<td>40.345*; df=3</td>
</tr>
<tr>
<td>1(^{st}) Course</td>
<td>44</td>
<td>7 (15.9%)</td>
<td>27 (61.4%)</td>
<td>8 (18.2%)</td>
<td>1 (2.3%)</td>
<td>1 (2.3%)</td>
<td>51.909*; df=4</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed 5 or more courses to date, 18.4 percent strongly agreed that lesson openers helped them succeed in their courses. Another 67.3 percent agreed. 14.3 percent were neutral. None chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, 17.2 percent strongly agreed that lesson openers helped them succeed in their courses. The majority (58.6 percent) agreed. 22.4 percent were neutral and 1 (1.7 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was currently enrolled in their first course, 15.9 percent strongly agreed that lesson openers helped them succeed in their course. Another 61.4 percent agreed. 18.2 percent were neutral, 1 respondent (2.3 percent) disagreed, and 1 (2.3 percent) strongly disagreed. The calculated chi-square value is significant.

All three calculated chi-square tests are significant. This indicates that the observed distribution of responses in Table 6 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 7. Responses by recency of study to Question 6: Lesson openers helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently Studying</td>
<td>127</td>
<td>17 (13.4%)</td>
<td>86 (67.7%)</td>
<td>21 (16.5%)</td>
<td>2 (1.6%)</td>
<td>1 (0.8%)</td>
<td>193.118*; df=4</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>21</td>
<td>7 (33.3%)</td>
<td>8 (38.1%)</td>
<td>6 (28.6%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.286NS; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the group which was currently studying at least one course, 13.4 percent strongly agreed that lesson openers helped them succeed in their courses. Another 67.7 percent agreed. 21 (16.5 percent) were neutral, 2 (1.6 percent) disagreed, and 1 (0.8 percent) strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, One-third strongly agreed that lesson openers helped them succeed in their courses. Another 38.1 percent agreed. 6 (28.6 percent) were neutral. None chose the disagree or strongly disagree options. The calculated chi-square test for this group is not significant.

Only the calculated chi-square test for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in Table 7 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Question 17 was a parallel to Question 6 (“Lesson openers helped me succeed in the courses”). Whereas Question 6 responses were located on a Likert scale, Question 17 was part of a rank-order set in which the respondents ranked each of the eleven instructional development factors from 1 to 11, with 1 representing the most helpful and 11 the least helpful in achieving success in the courses. Thus, respondents were asked to
rank lesson openers between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 17 appear in Tables 8 – 13.

Table 8. Responses to Question 17: Rank Lesson Openers from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
<td>9.0</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>4.9</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>4.9</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
<td>10.4</td>
</tr>
<tr>
<td>7</td>
<td>19</td>
<td>13.2</td>
</tr>
<tr>
<td>8</td>
<td>26</td>
<td>18.1</td>
</tr>
<tr>
<td>9</td>
<td>18</td>
<td>12.5</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>13.9</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2 = 38.569^*; \text{ df}=10$

In the chi-square goodness-of-fit test reported in Table 8, a theoretical distribution of expected frequencies of 13.1 per response category was used for comparison purposes. With 10 degrees of freedom, a critical chi-square value of 18.307 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 144 respondents to Question 17, 9 percent ranked lesson openers number 1 (most helpful), 5.6 percent ranked it number 2, 4.9 percent ranked it number 3, 4.9 percent ranked it number 4, 5.6 percent ranked it number 5, 10.4 percent ranked it number 6, 13.2 percent ranked it number 7, 18.1 percent ranked it number 8, 12.5 percent ranked it number 9, 13.9 percent ranked it number 10, and 2.1 percent ranked it number 11 (least helpful). The calculated chi-square value of 38.569 indicates that the observed distribution of responses in Table 8 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 9. Responses by gender to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7 (7.3%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>2</td>
<td>8 (8.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>4 (4.2%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>4</td>
<td>6 (6.3%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>5</td>
<td>5 (5.2%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>6</td>
<td>11 (11.5%)</td>
<td>4 (8.3%)</td>
</tr>
<tr>
<td>7</td>
<td>14 (14.6%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>8</td>
<td>13 (13.5%)</td>
<td>13 (27.1%)</td>
</tr>
<tr>
<td>9</td>
<td>13 (13.5%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>10</td>
<td>12 (12.5%)</td>
<td>8 (16.7%)</td>
</tr>
<tr>
<td>11</td>
<td>3 (3.1%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>48</td>
</tr>
</tbody>
</table>

χ² = 18.354*; df = 10  \ χ² = 18.375*; df = 8

Of the male respondents, 7.3 percent ranked lesson openers number 1 (most helpful), 8.3 percent ranked it number 2, 4.2 percent ranked it number 3, 6.3 percent ranked it number 4, 5.2 percent ranked it number 5, 11.5 percent ranked it number 6, 14.6 percent ranked it number 7, 13.5 percent ranked it number 8, 13.5 percent ranked it number 9, 12.5 percent ranked it number 10, and 3.1 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the female respondents, 12.5 percent ranked lesson openers number 1, none ranked it number 2, 6.3 percent ranked it number 3, 2.1 percent ranked it number 4, 6.3 percent ranked it number 5, 8.3 percent ranked it number 6, 10.4 percent ranked it number 7, 27.1 percent ranked it number 8, 10.4 percent ranked it number 9, 16.7 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that the observed distribution of responses in Table 9 departs significantly from the distribution of
responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 10. Responses by age to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 (6.8%)</td>
<td>4 (8.7%)</td>
<td>5 (12.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>2</td>
<td>2 (4.5%)</td>
<td>1 (2.2%)</td>
<td>3 (7.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>3</td>
<td>2 (4.5%)</td>
<td>2 (4.3%)</td>
<td>2 (5.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>4</td>
<td>2 (4.5%)</td>
<td>4 (8.7%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>2 (4.5%)</td>
<td>2 (4.3%)</td>
<td>2 (5.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>6</td>
<td>3 (6.8%)</td>
<td>6 (13.0%)</td>
<td>5 (12.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>8 (18.2%)</td>
<td>6 (13.0%)</td>
<td>5 (12.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>7 (15.9%)</td>
<td>8 (17.4%)</td>
<td>9 (22.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>9</td>
<td>7 (15.9%)</td>
<td>5 (10.9%)</td>
<td>3 (7.5%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>10</td>
<td>7 (15.9%)</td>
<td>8 (17.4%)</td>
<td>4 (10.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>1 (2.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>46</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

χ²=17.500NS; df=10
χ²=11.826NS; df=9
χ²=15.000NS; df=10
χ²=2.714NS; df=8

Of the respondents in the Under 30 group, 6.8 percent ranked lesson openers number 1 (most helpful), 4.5 percent each ranked it numbers 2, 3, 4, and 5, 6.8 percent ranked it number 6, 18.2 percent ranked it number 7, 15.9 percent each ranked it number 8, 9, and 10, and 2.3 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.

Of the respondents in the 30-39 age group, 8.7 percent ranked lesson openers number 1, 2.2 percent ranked it number 2, 4.3 percent ranked it number 3, 8.7 percent ranked it number 4, 4.3 percent ranked it number 5, 13.0 percent ranked it number 6 and 7, 17.4 percent ranked it number 8, 10.9 percent ranked it number 9, 17.4 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.
Of the respondents in the 40-49 age group, 12.5 percent ranked lesson openers number 1, 7.5 percent ranked it number 2, 5 percent ranked it number 3, 2.5 percent ranked it number 4, 5 percent ranked it number 5, 12.5 percent each ranked it number 6 and 7, 22.5 percent ranked it number 8, 7.5 percent ranked it number 9, 10 percent ranked it number 10, and 2.5 percent ranked it number 11. The calculated chi-square value is not significant.

Of the respondents in the 50 or Over age group, 7.1 percent ranked lesson openers number 1, 14.3 percent ranked it number 2, 7.1 percent ranked it number 3, none ranked it number 4, 14.3 percent ranked it number 5, 7.1 percent ranked it number 6, none ranked it number 7, 14.3 percent ranked it number 8, 21.4 percent ranked it number 9, and 7.1 percent each ranked it number 10 and number 11. The calculated chi-square value is not significant.

None of the calculated chi-square values is significant. This indicates that the observed distribution of responses in Table 10 does not represent a significant departure for any group from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 11. Responses by ethnic background to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>11 (9.0%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>2</td>
<td>1 (20.0%)</td>
<td>6 (4.9%)</td>
<td>1 (33.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (20.0%)</td>
<td>5 (4.1%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 (0.0%)</td>
<td>6 (4.9%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>5</td>
<td>1 (20.0%)</td>
<td>4 (3.3%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>6</td>
<td>0 (0.0%)</td>
<td>13 (10.7%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>7</td>
<td>0 (0.0%)</td>
<td>18 (14.8%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (20.0%)</td>
<td>22 (18.0%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>9</td>
<td>1 (20.0%)</td>
<td>17 (13.9%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>17 (13.9%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>3 (2.5%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>122</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

$\chi^2=0.000$ NS; df=4  $\chi^2=40.115^*; df=10$  $\chi^2=0.000$ NS; df=2  $\chi^2=1.200$ NS; df=7

Of the American Indian respondents, none ranked lesson openers number 1 (most helpful) and none ranked it number 11 (least helpful). 1 (20.0 percent) ranked it number 2, 1 (20.0 percent) ranked it number 3, 1 (20.0 percent) ranked it number 5, 1 (20.0 percent) ranked it number 8, and 1 (20.0 percent) ranked it number 9. The calculated chi-square value is not significant.

Of the Caucasian respondents, 9.0 percent ranked lesson openers number 1, 4.9 percent ranked it number 2, 4.1 percent ranked it number 3, 4.9 percent ranked it number 4, 3.3 percent ranked it number 5, 10.7 percent ranked it number 6, 14.8 percent ranked it number 7, 18.0 percent ranked it number 8, 13.9 percent ranked it number 9, 13.9 percent ranked it number 10, and 2.5 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the Black respondents, 1 (33.3 percent) ranked lesson openers number 1, 1 (33.3 percent) ranked it number 2, and 1 (33.3 percent) ranked it number 10. None ranked it number 11. The calculated chi-square value is not significant.
Of the Hispanic respondents, 1 (10.0 percent) ranked lesson openers number 1, 1
(10.0 percent) ranked it number 3, 1 (10.0 percent) ranked it number 4, 2 (20.0 percent)
ranked it number 5, 1 (10.0 percent) ranked it number 6, 1 (10.0 percent) ranked it
number 7, 2 (20.0 percent) ranked it number 8, none ranked it number 9, 1 (10.0 percent)
ranked it number 10, and none ranked it number 11. The calculated chi-square value is
not significant.

Only the calculated chi-square value for the Caucasian group is significant. This
indicates that the observed distribution of responses for this group in Table 11 departs
significantly from the distribution of responses expected under the condition of the
hypothesis of no differences in the numbers of responses per response category.

Table 12. Responses by number of courses completed to Question 17: Rank lesson
openers from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 (10.9%)</td>
<td>3 (5.4%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>2</td>
<td>2 (4.3%)</td>
<td>3 (5.4%)</td>
<td>3 (7.1%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>2 (3.6%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>4</td>
<td>5 (10.9%)</td>
<td>1 (1.8%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>5</td>
<td>5 (10.9%)</td>
<td>3 (5.4%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>4 (8.7%)</td>
<td>6 (10.7%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>7</td>
<td>8 (17.4%)</td>
<td>6 (10.7%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>8</td>
<td>5 (10.9%)</td>
<td>12 (21.4%)</td>
<td>9 (21.4%)</td>
</tr>
<tr>
<td>9</td>
<td>7 (15.2%)</td>
<td>4 (7.1%)</td>
<td>7 (16.7%)</td>
</tr>
<tr>
<td>10</td>
<td>5 (10.9%)</td>
<td>14 (25.0%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>2 (3.6%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>56</td>
<td>42</td>
</tr>
</tbody>
</table>

χ² = 4.478 NS; df = 8  χ² = 35.143*; df = 10  χ² = 15.619 NS; df = 9

Of the respondents in the group which had completed 5 or more courses to date,
10.9 percent ranked lesson openers number 1 (most helpful), 4.3 percent ranked it
number 2, none ranked it number 3, 10.9 percent ranked it number 4, 10.9 percent ranked
it number 5, 8.7 percent ranked it number 6, 17.4 percent ranked it number 7, 10.9
percent ranked it number 8, 15.2 percent ranked it number 9, 10.9 percent ranked it
number 10, and none ranked it number 11 (least helpful). The calculated chi-square value
is not significant.

Of the respondents in the group which had completed between 1 and 4 courses to
date, 5.4 percent ranked lesson openers number 1, another 5.4 percent ranked it number
2, 3.6 percent ranked it number 3, 1.8 percent ranked it number 4, 5.4 percent ranked it
number 5, 10.7 percent ranked it number 6, 10.7 percent ranked it number 7, 21.4 percent
ranked it number 8, 7.1 percent ranked it number 9, 25 percent ranked it number 10, and
3.6 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the group currently enrolled in their first course, 11.9
percent ranked lesson openers number 1, 7.1 percent ranked it number 2, 11.9 percent
ranked it number 3, 2.4 percent ranked it number 4, none ranked it number 5, 11.9
percent ranked it number 6, 11.9 percent ranked it number 7, 21.4 percent ranked it
number 8, 16.7 percent ranked it number 9, 2.4 percent ranked it number 10, and 2.4
percent ranked it number 11. The calculated chi-square value is not significant.

Only the calculated chi-square value for the group which had completed between
1 and 4 courses is significant. This indicates that for this group the observed distribution
of responses in Table 12 departs significantly from the distribution of responses expected
under the condition of the hypothesis of no differences in the numbers of responses per
response category.
Table 13. Responses by recency of study to Question 17: Rank lesson openers from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9 (7.3%)</td>
<td>4 (21.1%)</td>
</tr>
<tr>
<td>2</td>
<td>8 (6.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>6 (4.8%)</td>
<td>1 (5.3%)</td>
</tr>
<tr>
<td>4</td>
<td>7 (5.6%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>6 (4.8%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>6</td>
<td>13 (10.5%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>7</td>
<td>16 (12.9%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>8</td>
<td>20 (16.1%)</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>9</td>
<td>18 (14.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>18 (14.5%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>11</td>
<td>3 (2.4%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>19</td>
</tr>
</tbody>
</table>

$\chi^2 = 31.065^*; \text{ df } = 10$  

Of the respondents in the Currently Studying group, 7.3 percent ranked lesson openers number 1 (most helpful), 6.5 percent ranked it number 2, 4.8 percent ranked it number 3, 5.6 percent ranked it number 4, 4.8 percent ranked it number 5, 10.5 percent ranked it number 6, 12.9 percent ranked it number 7, 16.1 percent ranked it number 8, 14.5 percent ranked it number 9, 14.5 percent ranked it number 10, and 2.4 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the Within the Past 12 Months group, 21.1 percent ranked lesson openers number 1, none ranked it number 2, 5.3 percent ranked it number 3, none ranked it number 4, 10.5 percent ranked it number 5, 10.5 percent ranked it number 6, 15.8 percent ranked it number 7, 26.3 percent ranked it number 8, none ranked it number 9, 10.5 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.

Only the calculated chi-square value for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in
Table 13 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section Three: Lesson Artwork Data

For Question 7, respondents were to locate on a Likert scale their perception of the helpfulness of lesson artwork in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 14 – 19.

Table 14. Responses to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>8</td>
<td>5.3</td>
</tr>
<tr>
<td>Agree</td>
<td>29</td>
<td>19.1</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>82</td>
<td>53.9</td>
</tr>
<tr>
<td>Disagree</td>
<td>28</td>
<td>18.4</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2=125.566^*; \ df=4$

In the chi-square goodness of fit test reported in Table 14, a theoretical distribution of expected frequency of 30.4 per response category was used for comparison purposes. With 4 degrees of freedom, a critical chi-square value of 7.815 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 152 respondents to question 7, 8 (5.3 percent) strongly agreed that lesson artwork helped them succeed in their courses, and 29 (19.1 percent) agreed with this statement. The majority (53.9 percent) were neutral; 28 (18.4 percent) disagreed that lesson artwork was helpful and 5 (3.3 percent) strongly disagreed. The observed chi-square value of 125.566
indicates that the observed distribution of responses in Table 14 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 15. Responses by gender to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>101</td>
<td>4 (4.0%)</td>
<td>21 (20.8%)</td>
<td>54 (53.5%)</td>
<td>18 (17.8%)</td>
<td>4 (4.0%)</td>
<td>82.812*; df=4</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>4 (7.8%)</td>
<td>8 (15.7%)</td>
<td>28 (54.9%)</td>
<td>10 (19.6%)</td>
<td>1 (2.0%)</td>
<td>43.608*; df=4</td>
</tr>
</tbody>
</table>

Of the male respondents, 4.0 percent strongly agreed that lesson artwork helped them succeed in their courses. Another 20.8 percent agreed. The majority (53.5 percent) were neutral. 17.8 percent disagreed and 4.0 percent strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, 7.8 percent strongly agreed that lesson artwork helped them succeed in their courses. Another 15.7 percent agreed. The majority (54.9 percent) were neutral. 19.6 percent disagreed and 2.0 percent strongly disagreed. The calculated chi-square value is significant.

Both chi-square tests are significant. This indicates that the observed distribution of responses in Table 15 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 16. Responses by age to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>2 (4.4%)</td>
<td>4 (8.9%)</td>
<td>30 (66.7%)</td>
<td>7 (15.6%)</td>
<td>2 (4.4%)</td>
<td>63.111*; df=4</td>
</tr>
<tr>
<td>30-39</td>
<td>50</td>
<td>2 (4.0%)</td>
<td>10 (20.0%)</td>
<td>24 (48.0%)</td>
<td>11 (22.0%)</td>
<td>3 (6.0%)</td>
<td>31.000*; df=4</td>
</tr>
<tr>
<td>40-49</td>
<td>43</td>
<td>3 (7.0%)</td>
<td>11 (25.6%)</td>
<td>20 (46.5%)</td>
<td>9 (20.9%)</td>
<td>0 (0.0%)</td>
<td>13.837*; df=3</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>1 (7.1%)</td>
<td>4 (28.6%)</td>
<td>8 (57.1%)</td>
<td>1 (7.1%)</td>
<td>0 (0.0%)</td>
<td>9.429*; df=3</td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 age group, 4.4 percent strongly agreed that lesson art helped them succeed in their courses. Another 8.9 percent agreed. A two-thirds majority were neutral. 15.6 percent disagreed and 4.4 percent strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 30-39 year old group, 4.0 percent strongly agreed that lesson art helped them succeed in their courses. Another 20.0 percent agreed. Slightly less than one-half (48.0 percent) were neutral. 22.0 percent disagreed and 6.0 percent strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 year old group, 7.0 percent strongly agreed that lesson art helped them succeed in their courses. Another 25.6 percent agreed. Slightly less than one-half (46.5 percent) were neutral. 20.9 percent disagreed and none strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, 1 (7.1 percent) strongly agreed that lesson art helped them succeed in their courses. Another 4 (28.6 percent) agreed. More than one-half (57.1 percent) were neutral. 1 (7.1 percent) disagreed with the statement and none strongly disagreed. The calculated chi-square value is significant.

The chi-square tests are significant for all age groups. This indicates that the observed distribution of responses in Table 16 departs significantly from the distribution
of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 17. Responses by ethnic background to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>0 ( 0.0%)</td>
<td>3 (50.0%)</td>
<td>3 (50.0%)</td>
<td>0 ( 0.0%)</td>
<td>0 (0.0%)</td>
<td>0.000NS; df=1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>124</td>
<td>5 ( 4.0%)</td>
<td>22 (17.7%)</td>
<td>72 (58.1%)</td>
<td>21 (16.9%)</td>
<td>4 (3.2%)</td>
<td>123.984*; df=4</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
<td>2 (40.0%)</td>
<td>0 (0.0%)</td>
<td>0.200NS; df=1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>0 ( 0.0%)</td>
<td>4 (33.3%)</td>
<td>3 (25.0%)</td>
<td>4 (33.3%)</td>
<td>1 (8.3%)</td>
<td>2.000NS; df=3</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, none strongly agreed that lesson artwork helped them succeed in their courses while 3 (50.0 percent) agreed with this statement. 50.0 percent chose the neutral option, and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, 4.0 percent strongly agreed that lesson artwork helped them succeed in the courses. Another 17.7 percent agreed. The majority (58.1 percent) were neutral. 21 (16.9 percent) disagreed and 4 (3.2 percent) strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed that lesson artwork helped them succeed in their courses, none agreed, and none chose the neutral option. 2 (40.0 percent) disagreed and none strongly disagreed. The calculated chi-square value is not significant.

Of the Hispanic respondents, none strongly agreed that lesson artwork helped them succeed in their courses. 4 (33.3 percent) agreed. 3 (25.0 percent) chose the neutral
option, 4 (33.3 percent) disagreed with the statement, and 1 (8.3 percent) strongly disagreed. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 17 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 18. Responses by number of courses completed to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>=&gt;5</td>
<td>49</td>
<td>4 (8.2%)</td>
<td>8 (16.3%)</td>
<td>24 (49.0%)</td>
<td>10 (20.4%)</td>
<td>3 (6.1%)</td>
<td>29.061*; df=4</td>
</tr>
<tr>
<td>1-4</td>
<td>59</td>
<td>2 (3.4%)</td>
<td>11 (18.6%)</td>
<td>31 (52.5%)</td>
<td>14 (23.7%)</td>
<td>1 (1.7%)</td>
<td>49.729*; df=4</td>
</tr>
<tr>
<td>1st Course</td>
<td>44</td>
<td>2 (4.5%)</td>
<td>10 (22.7%)</td>
<td>27 (61.4%)</td>
<td>4 (9.1%)</td>
<td>1 (2.3%)</td>
<td>52.591*; df=4</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed 5 or more courses to date, 8.2 percent strongly agreed that lesson artwork helped them succeed in their courses. Another 16.3 percent agreed. Slightly less than one-half (49.0 percent) were neutral. 20.4 percent disagreed and 6.1 percent strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses, and 3.4 percent strongly agreed that lesson artwork helped them succeed in their courses. Another 18.6 percent agreed. Slightly more than one-half (52.5 percent) were neutral, 23.7 percent disagreed, and 1.7 percent strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in their first course, 4.5 percent strongly agreed that lesson artwork helped them succeed in their course. Another
22.7 percent agreed. The majority (61.4 percent) were neutral, 9.1 percent disagreed, and 2.3 percent strongly disagreed. The calculated chi-square value is significant.

The chi-square tests are significant for all three groups. This indicates that the observed distribution of responses in Table 18 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 19. Responses by recency of study to Question 7: The artwork at the beginning of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently</td>
<td>128</td>
<td>4 (3.1%)</td>
<td>27 (21.1%)</td>
<td>74 (57.8%)</td>
<td>19 (14.8%)</td>
<td>4 (3.1%)</td>
<td>129.734*; df=4</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>21</td>
<td>3 (14.3%)</td>
<td>2 (9.5%)</td>
<td>7 (33.3%)</td>
<td>8 (38.1%)</td>
<td>1 (4.8%)</td>
<td>9.238*; df=4</td>
</tr>
</tbody>
</table>

Of the respondents in the group which was currently studying at least one course, 3.1 percent strongly agreed that lesson artwork helped them succeed in their courses. Another 21.1 percent agreed. The majority (57.8 percent) were neutral. 14.8 percent disagreed and 3.1 percent strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which had studied within the past 12 months (but were not currently studying), 14.3 percent strongly agreed that lesson artwork helped them succeed in the courses. Another 9.5 percent agreed. One-third were neutral, 38.1 percent disagreed, and 4.8 percent strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both groups are significant. This indicates that the observed distribution of responses in Table 19 departs significantly from the distribution.
of responses expected under the condition of the hypothesis of no differences in the
numbers of responses per response category.

Question 18 was a parallel to Question 7 (“Lesson artwork helped me succeed in
the courses”). Whereas Question 7 responses were located on a Likert scale, Question 18
was part of a rank-order set in which the respondents ranked each of the eleven
instructional development factors from 1 to 11, with 1 being the most helpful and 11 the
least helpful in achieving success in the courses. Thus, respondents were asked to rank
lesson artwork between 1 and 11 on the rank-order scale. The results of statistical tests on
the responses to Question 18 appear in Tables 20 – 25.

Table 20. Responses to Question 18: Rank Lesson Artwork from 1 to 11 in order of
helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>3.5</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>9</td>
<td>21</td>
<td>14.6</td>
</tr>
<tr>
<td>10</td>
<td>23</td>
<td>16.0</td>
</tr>
<tr>
<td>11</td>
<td>85</td>
<td>59.0</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 371.375^*; \; df = 8 \]

In the chi-square goodness-of-fit test reported in Table 20, a theoretical
distribution of expected frequencies of 16.0 per response category was used for
comparison purposes. With 8 degrees of freedom, a critical chi-square value of 15.507
was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the
144 respondents to Question 18, none ranked lesson artwork number 1 (most helpful), 0.7
percent ranked it number 2, 0.7 percent ranked it number 3, 1.4 percent ranked it number 4, 1.4 percent ranked it number 5, 3.5 percent ranked it number 6, none ranked it number 7, 2.8 percent ranked it number 8, 14.6 percent ranked it number 9, 16 percent ranked it number 10, and 59 percent ranked it number 11. The calculated chi-square value of 371.375 indicates that the observed distribution of responses in Table 20 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 21. Responses by gender to Question 18: Rank lesson artwork from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>4</td>
<td>2 (2.1%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>2 (2.1%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>3 (3.1%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>7</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>3 (3.1%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>9</td>
<td>16 (16.7%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>10</td>
<td>17 (17.7%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>11</td>
<td>53 (55.2%)</td>
<td>32 (66.7%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>48</td>
</tr>
</tbody>
</table>

χ²=150.458*;df=6   χ²=111.250*;df=6

Of the male respondents, none ranked lesson artwork numbers 1 (most helpful), 2, or 3, 2 (2.1 percent) ranked it number 4, 2 (2.1 percent) ranked it number 5, 3 (3.1 percent) ranked it number 6, none ranked it number 7, 3 (3.1 percent) ranked it number 8, 16 (16.7 percent) ranked it number 9, 17 (17.7 percent) ranked it number 10, and a majority (55.2 percent) ranked it number 11 (least helpful). The calculated chi-square value is significant.
Of the female respondents, none ranked lesson artwork number 1, 1 (2.1 percent) ranked it number 2, 1 (2.1 percent) ranked it number 3, none ranked it either number 4 or 5, 2 (4.2 percent) ranked it number 6, none ranked it number 7, 1 (2.1 percent) ranked it number 8, 5 (10.4 percent) ranked it number 9, 6 (12.5 percent) ranked it number 10, and two-thirds (66.7 percent) ranked it number 11. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that the observed distribution of responses in Table 21 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 22. Responses by age to Question 18: Rank lesson artwork from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 (0.0%)</td>
<td>1 (2.2%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 (0.0%)</td>
<td>1 (2.2%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>2 (4.5%)</td>
<td>2 (4.3%)</td>
<td>0 (0.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>2 (4.5%)</td>
<td>0 (0.0%)</td>
<td>2 (5.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>8 (18.2%)</td>
<td>3 (6.5%)</td>
<td>8 (20.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>10</td>
<td>4 (9.1%)</td>
<td>10 (21.7%)</td>
<td>6 (15.0%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>11</td>
<td>28 (63.6%)</td>
<td>29 (63.0%)</td>
<td>20 (50.0%)</td>
<td>8 (57.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>46</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

\( \chi^2 = 55.091^*; df = 4 \) \( \chi^2 = 78.696^*; df = 5 \) \( \chi^2 = 61.600^*; df = 7 \) \( \chi^2 = 8.286^*; df = 3 \)

Of the respondents in the Under 30 group, none ranked lesson artwork numbers 1 (most helpful), 2, 3, 4, or 5, 2 respondents (4.5 percent) ranked it number 6, none ranked it number 7, 2 (4.5 percent) ranked it number 8, 8 (18.2 percent) ranked it number 9, 4
(9.1 percent) ranked it number 10, and nearly two-thirds (63.6 percent) ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the 30-39 group, none ranked lesson artwork numbers 1, 2, or 3, 1 (2.2 percent) ranked it number 4, 1 (2.2 percent) ranked it number 5, 2 (4.3 percent) ranked it number 6, none ranked it number 7 or 8, 3 (6.5 percent) ranked it number 9, 10 (21.7 percent) ranked it number 10, and nearly two-thirds (63.0 percent) ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 40-49 group, none ranked lesson artwork number 1, 1 (2.5 percent) ranked it number 2, 1 (2.5 percent) ranked it number 3, 1 (2.5 percent) ranked it number 4, 1 (2.5 percent) ranked it number 5, none ranked it either number 6 or 7, 2 (5.0 percent) ranked it number 8, 8 (20.0 percent) ranked it number 9, 6 (15.0 percent) ranked it number 10, and exactly half (50.0 percent) ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 50 or Over group, none ranked lesson artwork numbers 1, 2, 3, 4, or 5, 1 (7.1 percent) ranked it number 6, none ranked it numbers 7 or 8, 2 (14.3 percent) ranked it number 9, 3 (21.4 percent) ranked it number 10, and over half (57.1 percent) ranked it number 11. The calculated chi-square value is significant.

All four chi-square tests are significant. This indicates that the observed distribution of responses in Table 22 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 23. Responses by ethnic background to Question 18: Rank lesson artwork from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 (0.0%)</td>
<td>2 (1.6%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 (0.0%)</td>
<td>1 (0.8%)</td>
<td>1 (33.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>0 (0.0%)</td>
<td>4 (3.3%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>7</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (20.0%)</td>
<td>3 (2.5%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>2 (40.0%)</td>
<td>12 (9.8%)</td>
<td>2 (66.7%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>22 (18.0%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>11</td>
<td>2 (40.0%)</td>
<td>77 (63.1%)</td>
<td>0 (0.0%)</td>
<td>5 (50.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>122</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

$\chi^2=0.400\text{NS; df=2}$  $\chi^2=310.000^*; \text{df=7}$  $\chi^2=0.333\text{NS; df=1}$  $\chi^2=6.000\text{NS; df=4}$

Of the American Indian respondents, 2 (40.0 percent) ranked lesson artwork number 11 (least helpful), 2 (40.0 percent) ranked it number 9, and 1 (20.0 percent) ranked it number 8. None ranked it higher than number 8. The calculated chi-square value is not significant.

Of the Caucasian respondents, none ranked lesson artwork numbers 1 (most helpful) or 2, 1 (0.8 percent) ranked it number 3, 2 (1.6 percent) ranked it number 4, 1 (0.8 percent) ranked it number 5, 4 (3.3 percent) ranked it number 6, none ranked it number 7, 3 (2.5 percent) ranked it number 8, 12 (9.8 percent) ranked it number 9, 22 (18.0 percent) ranked it number 10, and almost two-thirds (63.1 percent) ranked it number 11. The calculated chi-square value is significant.

Of the Black respondents, 1 (33.3 percent) ranked lesson artwork number 5 and 2 (66.7 percent) ranked it number 9. The calculated chi-square value is not significant.

Of the Hispanic respondents, 1 (10.0 percent) ranked lesson artwork number 2, 1 (10.0 percent) ranked it number 6, 2 (20.0 percent) ranked it number 9, 1 (10.0 percent) ranked it number 8, and 2 (20.0 percent) ranked it number 9. The calculated chi-square value is not significant.
ranked it number 10, and half ranked it number 11. The calculated chi-square value is significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 23 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 24. Responses by number of courses completed to Question 18: Rank lesson artwork from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>4</td>
<td>2 (4.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 (0.0%)</td>
<td>2 (3.6%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>2 (4.3%)</td>
<td>0 (0.0%)</td>
<td>3 (7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>2 (4.3%)</td>
<td>0 (0.0%)</td>
<td>2 (4.8%)</td>
</tr>
<tr>
<td>9</td>
<td>7 (15.2%)</td>
<td>10 (17.9%)</td>
<td>4 (9.5%)</td>
</tr>
<tr>
<td>10</td>
<td>6 (13.0%)</td>
<td>12 (21.4%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>11</td>
<td>27 (58.7%)</td>
<td>32 (57.1%)</td>
<td>26 (61.9%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46</strong></td>
<td><strong>56</strong></td>
<td><strong>42</strong></td>
</tr>
</tbody>
</table>

χ²=61.739*; df=5  χ²=34.857*; df=3  χ²=80.000*; df=6

Of the respondents in the group which had completed 5 or more courses to date, none ranked lesson artwork numbers 1 (most helpful), 2, or 3, 2 respondents (4.3 percent) ranked it number 4, none ranked it number 5, 2 (4.3 percent) ranked it number 6, none ranked it number 7, 2 (4.3 percent) ranked it number 8, 7 (15.2 percent) ranked it number 9, 6 (13 percent) ranked it number 10, and over half (58.7 percent) ranked it number 11 (least helpful). The calculated chi-square value is significant.
Of the respondents in the group which had completed between 1 and 4 courses, none ranked lesson artwork numbers 1, 2, 3, or 4, 2 respondents (3.6 percent) ranked it number 5, none ranked it numbers 6, 7, or 8, 10 (17.9 percent) ranked it number 9, 12 (21.4 percent) ranked it number 10, and over one-half (57.1 percent) ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the group which was currently enrolled in their first course, none ranked lesson artwork number 1, 1 (2.4 percent) ranked it number 2, 1 (2.4 percent) ranked it number 3, none ranked it numbers 4 or 5, 3 (7.1 percent) ranked it number 6, none ranked it number 7, 2 (4.8 percent) ranked it number 8, 4 (9.5 percent) ranked it number 9, 5 (11.9 percent) ranked it number 10, and slightly less than two-thirds (61.9 percent) ranked it number 11. The calculated chi-square value is significant.

All three chi-square tests are significant. This indicates that the observed distribution of responses in Table 24 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 25. Responses by recency of study to Question 18: Rank lesson artwork from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>1 ( 0.8%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>1 ( 0.8%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>2 ( 1.6%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>2 ( 1.6%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>4 ( 3.2%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>7</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>4 ( 3.2%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>15 (12.1%)</td>
<td>6 (31.6%)</td>
</tr>
<tr>
<td>10</td>
<td>18 (14.5%)</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>11</td>
<td>77 (62.1%)</td>
<td>7 (36.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>19</td>
</tr>
</tbody>
</table>

$\chi^2 = 349.226^*; \text{df}=8$  \quad $\chi^2 = 4.368\text{NS}; \text{df}=3$

Of the respondents in the Currently Studying group, none ranked lesson artwork number 1 (most helpful), 1 (0.8 percent) ranked it number 2, 1 (0.8 percent) ranked it number 3, 2 (1.6 percent) ranked it number 4, 2 (1.6 percent) ranked it number 5, 4 (3.2 percent) ranked it number 6, none ranked it number 7, 4 (3.2 percent) ranked it number 8, 15 (12.1 percent) ranked it number 9, 18 (14.5 percent) ranked it number 10, and nearly two thirds (62.1 percent) ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, none ranked lesson artwork numbers 1, 2, 3, 4, or 5, 1 (5.3 percent) ranked it number 6, none ranked it numbers 7 or 8, 6 (31.6 percent) ranked it number 9, 5 (26.3 percent) ranked it number 10, and 7 (36.8 percent) ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in Table 25 departs
significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section Four: Lesson Outline Data

For Question 8, respondents were to locate on a Likert scale their perception of the helpfulness of lesson outlines in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 26 – 31.

Table 26. Responses to Question 8: Lesson Outlines helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>34</td>
<td>22.5</td>
</tr>
<tr>
<td>Agree</td>
<td>91</td>
<td>60.3</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>21</td>
<td>13.9</td>
</tr>
<tr>
<td>Disagree</td>
<td>5</td>
<td>3.3</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(\chi^2 = 111.331^{*}; \text{ df } = 3\)

In the chi-square goodness-of-fit test reported in Table 26, a theoretical distribution of expected frequency of 37.8 per response category was used for comparison purposes. With 3 degrees of freedom, a critical chi-square value of 7.815 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 151 respondents to question 8, 34 (22.5 percent) strongly agreed that lesson outlines helped them succeed in their courses, and 91 (60.3 percent) agreed that lesson outlines were helpful; 21 (13.9 percent) were neutral, while only 5 (3.3 percent) disagreed with the statement. None strongly disagreed. The observed chi-square value of 111.331 indicates that the observed distribution of responses in Table 26 departs significantly from the
distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 27. Responses by gender to Question 8: Lesson outlines helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>101</td>
<td>24 (23.8%)</td>
<td>60 (59.4%)</td>
<td>15 (14.9%)</td>
<td>2 (2.0%)</td>
<td>0 (0.0%)</td>
<td>73.455*; df=3</td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>10 (20.0%)</td>
<td>31 (62.0%)</td>
<td>6 (12.0%)</td>
<td>3 (6.0%)</td>
<td>0 (0.0%)</td>
<td>38.480*; df=3</td>
</tr>
</tbody>
</table>

Of the male respondents, slightly less than one-fourth (23.8 percent) strongly agreed that lesson outlines helped them succeed in their courses. Another 59.4 percent agreed. 14.9 percent chose the neutral option and 2.0 percent disagreed with the statement. None strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, 20.0 percent strongly agreed that lesson outlines helped them succeed in their courses. Nearly two-thirds (62.0 percent). 12.0 percent were neutral, and 6.0 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Both chi-square tests are significant. This indicates that the observed distribution of responses in Table 27 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 28. Responses by age to Question 8: Lesson outlines helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>10 (22.2%)</td>
<td>24 (53.3%)</td>
<td>10 (22.2%)</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>24.067*; df=3</td>
</tr>
<tr>
<td>30-39</td>
<td>49</td>
<td>10 (20.4%)</td>
<td>29 (59.2%)</td>
<td>8 (16.3%)</td>
<td>2 (4.1%)</td>
<td>0 (0.0%)</td>
<td>33.367*; df=3</td>
</tr>
<tr>
<td>40-49</td>
<td>43</td>
<td>12 (27.9%)</td>
<td>27 (62.8%)</td>
<td>2 (4.7%)</td>
<td>2 (4.7%)</td>
<td>0 (0.0%)</td>
<td>38.953*; df=3</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>2 (14.3%)</td>
<td>11 (78.6%)</td>
<td>1 (7.1%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>13.000*; df=3</td>
</tr>
</tbody>
</table>
Of the respondents in the Under 30 age group, 22.2 percent strongly agreed that lesson outlines helped them succeed in their courses. More than one-half (53.3 percent) agreed. 22.2 percent were neutral and 1 (2.2 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, 20.4 percent strongly agreed that lesson outlines helped them succeed in their courses. More than half (59.2 percent) agreed with the statement. 16.3 percent were neutral and 2 (4.1 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 27.9 percent strongly agreed that lesson outlines helped them succeed in their courses. Slightly less than two-thirds (62.8 percent) agreed. 4.7 percent were neutral and 4.7 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 50 or Over group, 14.3 percent strongly agreed that lesson outlines helped them succeed in their courses. More than three-fourths (78.6 percent) agreed. 1 (7.1 percent) was neutral and none chose either of the disagree options. The calculated chi-square value is significant.

The chi-square tests for all age groups are significant. This indicates that the observed distribution of responses in Table 28 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 29. Responses by ethnic background to Question 8: Lesson outlines helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>2 (33.4%)</td>
<td>4 (66.6%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.667NS; df=1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>123</td>
<td>25 (20.3%)</td>
<td>76 (61.8%)</td>
<td>18 (14.6%)</td>
<td>4 (3.3%)</td>
<td>0 (0.0%)</td>
<td>96.220*; df=3</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>1 (20.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1.600NS; df=2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>3 (25.0%)</td>
<td>7 (58.3%)</td>
<td>1 (8.3%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>8.000*; df=3</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, 2 (33.4 percent) strongly agreed that lesson outlines helped them succeed in their courses. Another 4 (66.6 percent) agreed. None were neutral and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, 25 (20.3 percent) strongly agreed that lesson outlines helped them succeed in their courses. Another 76 (61.8 percent) agreed. 18 (14.6 percent) were neutral and 4 (3.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed that lesson outlines helped them succeed in their courses. Another 1 (20.0 percent) agreed. 1 (20.0 percent) was neutral and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the Hispanic respondents, one-fourth strongly agreed that lesson outlines helped them succeed in their courses and more than one-half (58.3 percent). 1 (8.3 percent) was neutral and 1 (8.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.
Only the chi-square tests for the Caucasian and Hispanic groups are significant.

This indicates that for these two groups the observed distribution of responses in Table 29 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 30. Responses by number of courses completed to Question 8: Lesson outlines helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=5</td>
<td>49</td>
<td>8 (16.3%)</td>
<td>30 (61.2%)</td>
<td>8 (16.3%)</td>
<td>3 (6.1%)</td>
<td>0 (0.0%)</td>
<td>35.653*; df=3</td>
</tr>
<tr>
<td>1-4</td>
<td>59</td>
<td>17 (28.8%)</td>
<td>33 (55.9%)</td>
<td>7 (11.9%)</td>
<td>2 (3.4%)</td>
<td>0 (0.0%)</td>
<td>38.017*; df=3</td>
</tr>
<tr>
<td>1st Course</td>
<td>43</td>
<td>9 (20.9%)</td>
<td>28 (65.1%)</td>
<td>6 (14.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>19.860*; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed 5 or more courses to date, 16.3 percent strongly agreed that lesson outlines helped them succeed in their courses. Another 61.2 percent agreed with the statement. 16.3 percent were neutral and 6.1 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses, 28.8 percent strongly agreed that lesson outlines helped them succeed in their courses. Another 55.9 percent agreed. 11.9 percent were neutral and 3.4 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was currently enrolled in their first course, 20.9 percent strongly agreed that lesson outlines helped them succeed in their course. Another 65.1 percent agreed. 14.0 percent were neutral and none chose either of the disagree options. The calculated chi-square value is significant.

98
All three chi-square tests are significant. This indicates that the observed
distribution of responses in Table 30 departs significantly from the distribution of
responses expected under the condition of the hypothesis of no differences in the
numbers of responses per response category.

Table 31. Responses by recency of study to Question 8: Lesson outlines helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently Studying</td>
<td>127</td>
<td>27 (21.3%)</td>
<td>80 (63.0%)</td>
<td>16 (12.6%)</td>
<td>4 (3.1%)</td>
<td>0 (0.0%)</td>
<td>106.102*; df=3</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>21</td>
<td>5 (23.8%)</td>
<td>10 (47.6%)</td>
<td>5 (23.8%)</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>7.762NS; df=3</td>
</tr>
</tbody>
</table>

Of the respondents in the group that was currently studying, 21.3 percent strongly agreed that lesson outlines helped them succeed in their courses. Another 63.0 percent agreed. 12.6 percent were neutral and 3.1 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, 23.8 percent strongly agreed that lesson outlines helped them succeed in their courses. Another 47.6 percent agreed. 23.8 percent were neutral and 4.8 percent disagreed. None strongly disagreed. The calculated chi-square value is not significant.

Only the chi-square test for the Currently Studying group is significant. This indicates that the observed distribution of responses in Table 31 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Question 19 was a parallel to Question 8 ("Lesson outlines helped me succeed in the courses"). Whereas Question 8 responses were located on a Likert scale, Question 19 was part of a rank-order set in which the respondents ranked each of the eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus, respondents were asked to rank lesson outlines between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 19 appear in Tables 32 – 37.

Table 32. Responses to Question 19: Rank Lesson Outlines from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>11.1</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>8.3</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>6.3</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>6.9</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>12.5</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
<td>11.1</td>
</tr>
<tr>
<td>7</td>
<td>26</td>
<td>18.1</td>
</tr>
<tr>
<td>8</td>
<td>20</td>
<td>13.9</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>6.3</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>4.2</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\(\chi^2 = 36.125\); \(df = 10\)

In the chi-square goodness-of-fit test reported in Table 32, a theoretical distribution of expected frequencies of 13.1 per response category was used for comparison purposes. With 10 degrees of freedom, a critical chi-square value of 18.307 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 144 respondents to Question 17, 11.1 percent ranked it number 1 (most helpful), 8.3 percent ranked it number 2, 6.3 percent ranked it number 3, 6.9 percent ranked it number 4, 12.5 percent ranked it number 5, 11.1 percent ranked it number 6, 18.1 percent ranked
it number 7, 13.9 percent ranked it number 8, 6.3 percent ranked it number 9, 4.2 percent ranked it number 10, and 1.4 percent ranked it number 11 (least helpful). The calculated chi-square value of 36.125 shows that the observed distribution of responses in Table 32 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 33. Responses by gender to Question 19: Rank lesson outlines from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11 (11.5%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>2</td>
<td>8 (8.3%)</td>
<td>4 (8.3%)</td>
</tr>
<tr>
<td>3</td>
<td>6 (6.3%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>4</td>
<td>4 (4.2%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>5</td>
<td>14 (14.6%)</td>
<td>4 (8.3%)</td>
</tr>
<tr>
<td>6</td>
<td>10 (10.4%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>7</td>
<td>18 (18.8%)</td>
<td>8 (16.7%)</td>
</tr>
<tr>
<td>8</td>
<td>16 (16.7%)</td>
<td>4 (8.3%)</td>
</tr>
<tr>
<td>9</td>
<td>4 (4.2%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>10</td>
<td>4 (4.2%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (1.0%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>48</td>
</tr>
</tbody>
</table>

$\chi^2=35.313^*; df=10$  \hspace{1cm} $\chi^2=8.833NS; df=10$

Of the male respondents, 11.5 percent ranked lesson outlines number 1 (most helpful), 8.3 percent ranked it number 2, 6.3 percent ranked it number 3, 4.2 percent ranked it number 4, 14.6 percent ranked it number 5, 10.4 percent ranked it number 6, 18.8 percent ranked it number 7, 16.7 percent ranked it number 8, 4.2 percent ranked it number 9, 4.2 percent ranked it number 10, and 1 respondent (1.0 percent) ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the female respondents, 10.4 percent ranked lesson outlines number 1, 8.3 percent ranked it number 2, 6.3 percent ranked it number 3, 12.5 percent ranked it number 4, 8.3 percent ranked it number 5, 12.5 percent ranked it number 6, 16.7 percent
ranked it number 7, 8.3 percent ranked it number 8, 10.4 percent ranked it number 9, 4.2 percent ranked it number 10, and 1 respondent (2.1 percent) ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for males is significant. This indicates that for males the observed distribution of responses in Table 33 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 34. Responses by age to Question 19: Rank lesson outlines from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3 (6.8%)</td>
<td>5 (10.9%)</td>
<td>6 (15.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>2</td>
<td>2 (4.5%)</td>
<td>3 (6.5%)</td>
<td>7 (17.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>4 (9.1%)</td>
<td>1 (2.2%)</td>
<td>3 (7.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>4</td>
<td>4 (9.1%)</td>
<td>2 (4.3%)</td>
<td>3 (7.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>5</td>
<td>5 (11.4%)</td>
<td>6 (13.0%)</td>
<td>4 (10.0%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>6</td>
<td>7 (15.9%)</td>
<td>4 (8.7%)</td>
<td>3 (7.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>7</td>
<td>7 (15.9%)</td>
<td>12 (26.1%)</td>
<td>6 (15.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>8</td>
<td>5 (11.4%)</td>
<td>9 (19.6%)</td>
<td>4 (10.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>9</td>
<td>2 (4.5%)</td>
<td>4 (8.7%)</td>
<td>3 (7.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>4 (9.1%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>46</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

χ²=9.500NS; df=10
χ²=18.957*; df = 8
χ²=7.500NS; df = 9
χ²=2.000NS; df = 7

Of the respondents in the Under 30 group, 6.8 percent ranked lesson outlines number 1 (most helpful), 4.5 percent ranked it number 2, 9.1 percent ranked it number 3, 9.1 percent ranked it number 4, 11.4 percent ranked it number 5, 15.9 percent ranked it number 6, 15.9 percent ranked it number 7, 11.4 percent ranked it number 8, 4.5 percent ranked it number 9, 9.1 percent ranked it number 10, and 2.3 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.
Of the respondents in the 30-39 group, 10.9 percent ranked lesson outlines number 1, 6.5 percent ranked it number 2, 2.2 percent ranked it number 3, 4.3 percent ranked it number 4, 13 percent ranked it number 5, 8.7 percent ranked it number 6, 26.1 percent ranked it number 7, 19.6 percent ranked it number 8, 8.7 percent ranked it number 9, and none ranked it either number 10 or 11. The calculated chi-square value is significant.

Of the respondents in the 40-49 group, 15.0 percent ranked lesson outlines number 1, 17.5 percent ranked it number 2, 7.5 percent ranked it number 3, 7.5 percent ranked it number 4, 10.0 percent ranked it number 5, 7.5 percent ranked it number 6, 15.0 percent ranked it number 7, 10.0 percent ranked it number 8, 7.5 percent ranked it number 9, none ranked it number 10, and 2.5 percent ranked it number 11. The calculated chi-square value is not significant.

Of the respondents in the 50 or Over group, 14.3 percent ranked lesson outlines number 1, none ranked it number 2, 7.1 percent ranked it number 3, 7.1 percent ranked it number 4, 21.4 percent ranked it number 5, 14.3 percent ranked it number 6, 7.1 percent ranked it number 7, 14.3 percent ranked it number 8, none ranked it number 9, 14.3 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the 30-39 age group is significant. This indicates that for this group the observed distribution of responses in Table 34 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 35. Responses by ethnic background to Question 19: Rank lesson outlines from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 ( 0.0%)</td>
<td>13 (10.7%)</td>
<td>0 ( 0.0%)</td>
<td>3 (30.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 ( 0.0%)</td>
<td>10 ( 8.2%)</td>
<td>1 (33.3%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (20.0%)</td>
<td>7 ( 5.7%)</td>
<td>1 (33.3%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>1 (20.0%)</td>
<td>9 ( 7.4%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 ( 0.0%)</td>
<td>15 (12.3%)</td>
<td>0 ( 0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>6</td>
<td>1 (20.0%)</td>
<td>13 (10.7%)</td>
<td>0 ( 0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (20.0%)</td>
<td>23 (18.9%)</td>
<td>0 ( 0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>8</td>
<td>0 ( 0.0%)</td>
<td>17 (13.9%)</td>
<td>1 (33.3%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 ( 0.0%)</td>
<td>9 ( 7.4%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (20.0%)</td>
<td>5 ( 4.1%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 ( 0.0%)</td>
<td>1 ( 0.8%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>122</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

χ²=0.000NS;df=4  χ²=32.902*;df=10  χ²=0.000NS;df=2  χ²=1.000NS;df=4

Of the American Indian respondents, 1 (20.0 percent) ranked lesson outlines number 3, 1 (20.0 percent) ranked it number 4, 1 (20.0 percent) ranked it number 6, 1 (20.0 percent) ranked it number 7, and 1 (20.0 percent) ranked it number 10. None ranked it number 1 (most helpful) or number 11 (least helpful). The calculated chi-square value is not significant.

Of the Caucasian respondents, 10.7 percent ranked lesson outlines number 1, 8.2 percent ranked it number 2, 5.7 percent ranked it number 3, 7.4 percent ranked it number 4, 12.3 percent ranked it number 5, 10.7 percent ranked it number 6, 18.9 percent ranked it number 7, 13.9 percent ranked it number 8, 7.4 percent ranked it number 9, 4.1 percent ranked it number 10, and 0.8 percent ranked it number 11. The calculated chi-square value is significant.

Of the Black group respondents, 1 (33.3 percent) ranked lesson outlines number 2, 1 (33.3 percent) ranked it number 3, and 1 (33.3 percent) ranked it number 8. None ranked it lower than number 8. The calculated chi-square value is not significant.
Of the Hispanic respondents, 30.0 percent ranked lesson outlines number 1, none ranked it numbers 2, 3, or 4, 20.0 percent ranked it number 5, 10.0 percent ranked it number 6, 20.0 percent ranked it number 7, 20.0 percent ranked it number 8, and none ranked it numbers 9, 10, or 11. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that the observed distribution of responses in Table 35 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

**Table 36. Responses by number of courses completed to Question 19: Rank lesson outlines from 1 to 11 in order of helpfulness in successful course completion.**

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 (17.4%)</td>
<td>5 ( 8.9%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>2</td>
<td>3 ( 6.5%)</td>
<td>4 ( 7.1%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>3</td>
<td>2 ( 4.3%)</td>
<td>2 ( 3.6%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>4</td>
<td>0 ( 0.0%)</td>
<td>7 (12.5%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>5</td>
<td>10 (21.7%)</td>
<td>6 (10.7%)</td>
<td>2 ( 4.8%)</td>
</tr>
<tr>
<td>6</td>
<td>6 (13.0%)</td>
<td>5 ( 8.9%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>7</td>
<td>8 (17.4%)</td>
<td>10 (17.9%)</td>
<td>8 (19.0%)</td>
</tr>
<tr>
<td>8</td>
<td>6 (13.0%)</td>
<td>7 (12.5%)</td>
<td>7 (16.7%)</td>
</tr>
<tr>
<td>9</td>
<td>1 ( 2.2%)</td>
<td>6 (10.7%)</td>
<td>2 ( 4.8%)</td>
</tr>
<tr>
<td>10</td>
<td>2 ( 4.3%)</td>
<td>2 ( 3.6%)</td>
<td>2 ( 4.8%)</td>
</tr>
<tr>
<td>11</td>
<td>0 ( 0.0%)</td>
<td>2 ( 3.6%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>56</td>
<td>44</td>
</tr>
</tbody>
</table>

χ²=16.217*; df=8   χ²=12.357NS; df=10   χ²=9.905NS; df = 9

Of the respondents in the group which had completed 5 or more courses to date, 17.4 percent ranked lesson outlines number 1 (most helpful), 6.5 percent ranked it number 2, 4.3 percent ranked it number 3, none ranked it number 4, 21.7 percent ranked it number 5, 13 percent ranked it number 6, 17.4 percent ranked it number 7, 13 percent
ranked it number 8, 2.2 percent ranked it number 9, 4.3 percent ranked it number 10, and
none ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which had completed 1 to 4 courses to date, 8.9
percent ranked lesson outlines number 1, 7.1 percent ranked it number 2, 3.6 percent
ranked it number 3, 12.5 percent ranked it number 4, 10.7 percent ranked it number 5, 8.9
percent ranked it number 6, 17.9 percent ranked it number 7, 12.5 percent ranked it
number 8, 10.7 percent ranked it number 9, and 3.6 percent each ranked it number 10 and
11. The calculated chi-square value is not significant.

Of the respondents in the group which was enrolled in their first course, 7.1
percent ranked lesson outlines number 1, 11.9 percent ranked it number 2, 11.9 percent
ranked it number 3, 7.1 percent ranked it number 4, 4.8 percent ranked it number 5, 11.9
percent ranked it number 6, 19 percent ranked it number 7, 16.7 percent ranked it number
8, 4.8 percent ranked it number 9, 4.8 percent ranked it number 10, and none ranked it
number 11. The calculated chi-square value is not significant.

Only the chi-square test for the group that had completed at least 5 courses is
significant. This indicates that for this group the observed distribution of responses in
Table 36 departs significantly from the distribution of responses expected under the
condition of the hypothesis of no differences in the numbers of responses per response
category.
Table 37. Responses by recency of study to Question 19: Rank lesson outlines from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14 (11.3%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>2</td>
<td>10 ( 8.1%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>3</td>
<td>8 ( 6.5%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>4</td>
<td>8 ( 6.5%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>5</td>
<td>16 (12.9%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>6</td>
<td>14 (11.3%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>7</td>
<td>22 (17.7%)</td>
<td>4 (21.1%)</td>
</tr>
<tr>
<td>8</td>
<td>18 (14.5%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>9</td>
<td>7 ( 5.6%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>10</td>
<td>5 ( 4.0%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>11</td>
<td>2 ( 1.6%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>19</td>
</tr>
</tbody>
</table>

$\chi^2 = 32.306^*; \text{ df } = 10$ $\chi^2 = 3.632\text{NS}; \text{ df } = 9$

Of the respondents in the group which was currently studying, 11.3 percent ranked lesson outlines number 1 (most helpful), 8.1 percent ranked it number 2, 6.5 percent ranked it number 3, 6.5 percent ranked it number 4, 12.9 percent ranked it number 5, 11.3 percent ranked it number 6, 17.7 percent ranked it number 7, 14.5 percent ranked it number 8, 5.6 percent ranked it number 9, 4.0 percent ranked it number 10, and 1.6 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, 10.5 percent ranked lesson outlines number 1, 5.3 percent ranked it number 2, 5.3 percent ranked it number 3, 10.5 percent ranked it number 4, 10.5 percent ranked it number 5, 10.5 percent ranked it number 6, 21.1 percent ranked it number 7, 10.5 percent ranked it number 8, 10.5 percent ranked it number 9, 5.3 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.
Only the chi-square test for the Currently Studying group is significant. This indicates that the observed distribution of responses in Table 37 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section 5: Written Objectives Data

For Question 9, respondents were to locate on a Likert scale their perception of the helpfulness of written objectives in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 38 – 43.

Table 38. Responses to Question 9: Written objectives helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>44</td>
<td>28.9</td>
</tr>
<tr>
<td>Agree</td>
<td>78</td>
<td>51.3</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>26</td>
<td>17.1</td>
</tr>
<tr>
<td>Disagree</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2 = 77.263*$; df = 3

In the chi-square goodness-of-fit test reported in Table 38, a theoretical distribution of expected frequency of 38.0 per response category was used for comparison purposes. With 3 degrees of freedom, a critical chi-square value of 7.815 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 152 respondents to question 9, 44 (28.9 percent) strongly agreed that written objectives helped them succeed in their courses, and 78 (51.3 percent) agreed that lesson outlines were helpful; 26 (17.1 percent) were neutral, while only 4 (2.6 percent) disagreed with
the statement. None strongly disagreed. The observed chi-square value of 77.263 shows that the observed distribution of responses in Table 38 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 39: Responses by gender to Question 9: Written objectives helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>101</td>
<td>31 (30.7%)</td>
<td>50 (49.5%)</td>
<td>17 (16.8%)</td>
<td>3 (3.0%)</td>
<td>0 (0.0%)</td>
<td>47.871*; df=3</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>13 (25.5%)</td>
<td>28 (54.9%)</td>
<td>9 (17.6%)</td>
<td>1 (2.0%)</td>
<td>0 (0.0%)</td>
<td>30.176*; df=3</td>
</tr>
</tbody>
</table>

Of the male respondents, 30.7 percent strongly agreed that written objectives helped them succeed in their courses. Another 49.5 percent agreed. 16.8 percent were neutral and 3.0 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, slightly more than one-fourth (25.5 percent) strongly agreed that written objectives helped them succeed in their courses. Another 54.9 percent agreed. 17.6 percent were neutral and 2.0 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that the observed distribution of responses in Table 39 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 40: Responses by age to Question 9: Written objectives helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>13 (28.9%)</td>
<td>20 (44.4%)</td>
<td>9 (20.0%)</td>
<td>3 (6.7%)</td>
<td>0 (0.0%)</td>
<td>13.578*; df=3</td>
</tr>
<tr>
<td>30-39</td>
<td>50</td>
<td>15 (30.0%)</td>
<td>24 (48.0%)</td>
<td>10 (20.0%)</td>
<td>1 (2.0%)</td>
<td>0 (0.0%)</td>
<td>22.160*; df=3</td>
</tr>
<tr>
<td>40-49</td>
<td>43</td>
<td>12 (27.9%)</td>
<td>26 (60.5%)</td>
<td>5 (11.6%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>15.953*; df=2</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>4 (28.6%)</td>
<td>8 (57.1%)</td>
<td>2 (14.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>4.000NS; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 group, 28.9 percent strongly agreed that written objectives helped them succeed in their courses. Another 44.4 percent, 20.0 percent were neutral and 6.7 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, 30.0 percent strongly agreed that written objectives helped them succeed in their courses. Another 48.0 percent agreed. Another 20.0 percent were neutral and 2.0 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 27.9 percent strongly agreed that written objectives helped them succeed in their courses. Another 60.5 percent agreed. 11.6 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, 28.6 percent strongly agreed that written objectives helped them succeed in their courses. Another (57.1 percent) agreed. 14.3 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is not significant.

The chi-square tests for all groups except the 50 or Over group are significant. This indicates that for these groups the observed distribution of responses in Table 40
departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 41: Responses by ethnic background to Question 9: Written objectives helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>2 (33.3%)</td>
<td>4 (66.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.667NS;df=1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>124</td>
<td>34 (27.4%)</td>
<td>64 (51.6%)</td>
<td>23 (18.5%)</td>
<td>3 (2.4%)</td>
<td>0 (0.0%)</td>
<td>62.774*; df=3</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>2 (40.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.200NS;df=1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>4 (33.3%)</td>
<td>6 (50.0%)</td>
<td>1 (8.3%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>6.000NS;df=3</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, 2 (33.3 percent) strongly agreed that written objectives helped them succeed in their courses. Another 4 (66.7 percent) agreed. None chose the neutral option or either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, 27.4 percent strongly agreed that written objectives helped them succeed in their courses. Another 51.6 percent agreed. 18.5 percent were neutral and 2.4 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed that written objectives helped them succeed in their courses. Another 2 (40.0 percent) agreed. None chose the neutral option or either of the disagree options. The calculated chi-square value is not significant.

Of the Hispanic respondents, one-third (33.3 percent) strongly agreed that written objectives helped them succeed in their courses. Another 50.0 percent agreed. 1 (8.3 percent) was neutral and 1 (8.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is not significant.
Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 41 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 42. Responses by number of courses completed to Question 9: Written objectives helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=5</td>
<td>49</td>
<td>16 (32.7%)</td>
<td>21 (42.9%)</td>
<td>9 (18.4%)</td>
<td>3 (6.1%)</td>
<td>0 (0.0%)</td>
<td>15.245*; df=3</td>
</tr>
<tr>
<td>1-4</td>
<td>59</td>
<td>15 (25.4%)</td>
<td>34 (57.6%)</td>
<td>9 (15.3%)</td>
<td>1 (1.7%)</td>
<td>0 (0.0%)</td>
<td>40.186*; df=3</td>
</tr>
<tr>
<td>1st Course</td>
<td>44</td>
<td>13 (29.5%)</td>
<td>23 (52.3%)</td>
<td>8 (18.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>7.955*; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed 5 or more courses to date, almost one-third (32.7 percent) strongly agreed that written objectives helped them succeed in their courses. Another 42.9 percent agreed. 18.4 percent were neutral and 6.1 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which had completed 1-4 courses to date, slightly more than one-fourth (25.4 percent) strongly agreed that written objectives helped them succeed in their courses. Another 57.6 percent agreed. 15.3 percent were neutral and 1 (1.7 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in their first course, 29.5 percent strongly agreed that written objectives helped them succeed in their courses. Another 52.3 percent agreed. 18.2 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.
The chi-square tests for all three groups are significant. This indicates that the observed distribution of responses in Table 42 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 43. Responses by recency of study to Question 9: Written objectives helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently Studying</td>
<td>128</td>
<td>39 (30.5%)</td>
<td>65 (50.8%)</td>
<td>21 (16.4%)</td>
<td>3 (2.3%)</td>
<td>0 (0.0%)</td>
<td>65.625*</td>
<td>3</td>
<td>p</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>21</td>
<td>2 (9.5%)</td>
<td>13 (61.9%)</td>
<td>5 (23.8%)</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>16.905*</td>
<td>3</td>
<td>p</td>
</tr>
</tbody>
</table>

Of the respondents in the Currently Studying group, 30.5 percent strongly agreed that written objectives helped them succeed in their courses. Another 50.8 percent agreed. 16.4 percent were neutral and 2.3 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied in the past 12 months, 9.5 percent strongly agreed that written objectives helped them succeed in their courses. Another 61.9 percent agreed. 23.8 percent were neutral and 1 (4.8 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both groups are significant. This indicates that the observed distribution of responses in Table 43 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Question 20 was a parallel to Question 9 (“Written objectives helped me succeed in the courses”). Whereas Question 9 responses were located on a Likert scale, Question 20 was part of a rank-order set in which the respondents ranked each of the eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus respondents were asked to rank lesson openers between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 20 appear in Tables 44 – 49.

Table 44. Responses to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>7.6</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>4.9</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>8.3</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
<td>11.1</td>
</tr>
<tr>
<td>6</td>
<td>26</td>
<td>18.1</td>
</tr>
<tr>
<td>7</td>
<td>19</td>
<td>13.2</td>
</tr>
<tr>
<td>8</td>
<td>23</td>
<td>16.0</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
<td>9.0</td>
</tr>
<tr>
<td>11</td>
<td>5</td>
<td>3.5</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 40.097*; df = 10

In the chi-square goodness-of-fit test reported in Table 44, a theoretical distribution of expected frequencies of 13.1 per response category was used for comparison purposes. With 10 degrees of freedom, a critical chi-square value of 18.307 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 144 respondents to Question 20, 7.6 percent ranked written objectives number 1 (most helpful), 4.9 percent ranked it number 2, 8.3 percent ranked it number 3, 5.6 percent ranked it number 4, 11.1 percent ranked it number 5, 18.1 percent ranked it number 6,
13.2 percent ranked it number 7, 16 percent ranked it number 8, 2.8 percent ranked it number 9, 9 percent ranked it number 10, and 3.5 percent ranked it number 11. The calculated chi-square value of 40.097 shows that the observed distribution of responses in Table 44 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 45. Responses by gender to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 (8.3%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>2</td>
<td>6 (6.3%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>3</td>
<td>8 (8.3%)</td>
<td>4 (8.3%)</td>
</tr>
<tr>
<td>4</td>
<td>5 (5.2%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>5</td>
<td>11 (11.5%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>6</td>
<td>19 (19.8%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>7</td>
<td>12 (12.5%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>8</td>
<td>15 (15.6%)</td>
<td>8 (16.7%)</td>
</tr>
<tr>
<td>9</td>
<td>2 (2.1%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>10</td>
<td>8 (8.3%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>11</td>
<td>2 (2.1%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>48</td>
</tr>
</tbody>
</table>

$\chi^2=31.417^*; df=10$  $\chi^2=11.583NS; df=10$

Of the male respondents, 8.3 percent ranked written objectives number 1 (most helpful), 6.3 percent ranked it number 2, 8.3 percent ranked it number 3, 5.2 percent ranked it number 4, 11.5 percent ranked it number 5, 19.8 percent ranked it number 6, 12.5 percent ranked it number 7, 15.6 percent ranked it number 8, 2.1 percent ranked it number 9, 8.3 percent ranked it number 10, and 2.1 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the female respondents, 6.3 percent ranked written objectives number 1, 2.1 percent ranked it number 2, 8.3 percent ranked it number 3, 6.3 percent ranked it number
4, 10.4 percent ranked it number 5, 14.6 percent ranked it number 6, 14.6 percent ranked it number 7, 16.7 percent ranked it number 8, 4.2 percent ranked it number 9, 10.4 percent ranked it number 10, and 6.3 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for males is significant. This indicates that for males the observed distribution of responses in Table 45 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 46. Responses by age to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 (9.1%)</td>
<td>3 (6.5%)</td>
<td>3 (7.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>3 (6.5%)</td>
<td>3 (7.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>3</td>
<td>2 (4.5%)</td>
<td>1 (2.2%)</td>
<td>8 (20.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>4</td>
<td>2 (4.5%)</td>
<td>4 (8.7%)</td>
<td>1 (2.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>5</td>
<td>6 (13.6%)</td>
<td>5 (10.9%)</td>
<td>4 (10.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>6</td>
<td>10 (22.7%)</td>
<td>8 (17.4%)</td>
<td>7 (17.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>5 (11.4%)</td>
<td>6 (13.0%)</td>
<td>4 (10.0%)</td>
<td>4 (28.6%)</td>
</tr>
<tr>
<td>8</td>
<td>8 (18.2%)</td>
<td>9 (19.6%)</td>
<td>5 (12.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>9</td>
<td>0 (0.0%)</td>
<td>1 (2.2%)</td>
<td>2 (5.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>10</td>
<td>4 (9.1%)</td>
<td>5 (10.9%)</td>
<td>3 (7.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>11</td>
<td>3 (6.8%)</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>46</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

χ²=12.045NS; χ²=18.087NS; χ²=10.500NS; χ²=6.429NS; df=8 df=10 df=9 df=10

Of the respondents in the Under 30 age group, 9.1 percent ranked written objectives number 1 (most helpful), none ranked it number 2, 4.5 percent ranked it number 3, 4.5 percent ranked it number 4, 13.6 percent ranked it number 5, 22.7 percent ranked it number 6, 11.4 percent ranked it number 7, 18.2 percent ranked it number 8,
none ranked it number 9, 9.1 percent ranked it number 10, and 6.8 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.

Of the respondents in the 30-39 age group, 6.5 percent ranked written objectives number 1, 6.5 percent ranked it number 2, 2.2 percent ranked it number 3, 8.7 percent ranked it number 4, 10.9 percent ranked it number 5, 17.4 percent ranked it number 6, 13 percent ranked it number 7, 19.6 percent ranked it number 8, 2.2 percent ranked it number 9, 10.9 percent ranked it number 10, and 2.2 percent ranked it number 11. The calculated chi-square value is not significant.

Of the respondents in the 40-49 age group, 7.5 percent ranked written objectives number 1, 7.5 percent ranked it number 2, 20.0 percent ranked it number 3, 2.5 percent ranked it number 4, 10.0 percent ranked it number 5, 17.5 percent ranked it number 6, 10.0 percent ranked it number 7, 12.5 percent ranked it number 8, 5.0 percent ranked it number 9, 7.5 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.

Of the respondents in the 50 or Over age group, 1 respondent (7.1 percent) ranked written objectives at every category except number 7, where 4 respondents (28.6 percent) ranked the item. The calculated chi-square value is not significant.

None of the chi-square tests for the age groups is significant. This indicates that the observed distribution of responses in Table 46 does not represent a significant departure from the distribution of responses expected under the null hypothesis of no difference in the number of responses per response category.
Table 47. Responses by ethnic background to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (40.0%)</td>
<td>8 (6.6%)</td>
<td>1 (33.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>6 (4.9%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>9 (7.4%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 (0.0%)</td>
<td>7 (5.7%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 (0.0%)</td>
<td>16 (13.1%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>1 (20.0%)</td>
<td>23 (18.9%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>7</td>
<td>2 (40.0%)</td>
<td>15 (12.3%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>8</td>
<td>0 (0.0%)</td>
<td>20 (16.4%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 (0.0%)</td>
<td>4 (3.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>10 (8.2%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>4 (3.3%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>122</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

χ²=0.400NS; df=2  χ²=37.770*; df=10  χ²=0.000NS; df=2  χ²=1.200NS; df=7

Of the American Indian respondents, 2 (40.0 percent) ranked written objectives number 1 (most helpful), 1 (20.0 percent) ranked it number 6, and 2 (40.0 percent) ranked it number 7. None ranked it lower than number 7. The calculated chi-square value is not significant.

Of the Caucasian respondents, 6.6 percent ranked written objectives number 1, 4.9 percent ranked it number 2, 7.4 percent ranked it number 3, 5.7 percent ranked it number 4, 13.1 percent ranked it number 5, 18.9 percent ranked it number 6, 12.3 percent ranked it number 7, 16.4 percent ranked it number 8, 3.3 percent ranked it number 9, 8.2 percent ranked it number 10, and 3.3 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the Black respondents, 1 (33.3 percent) ranked written objectives number 1, 1 (33.3 percent) ranked it number 3, and 1 (33.3 percent) ranked it number 6. None ranked the item lower than number 6. The calculated chi-square value is not significant.
Of the Hispanic respondents, none ranked written objectives number 1, 1 (10.0 percent) ranked it number 2, 1 (10.0 percent) ranked it number 3, 1 (10.0 percent) ranked it number 4, none ranked it number 5, 1 (10.0 percent) ranked it number 6, 1 (10.0 percent) ranked it number 7, 2 (20.0 percent) ranked it number 8, none ranked it number 9, 2 (20.0 percent) ranked it number 10, and 1 (10.0 percent) ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 47 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 48. Responses by number of courses completed to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (4.3%)</td>
<td>3 (5.4%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>2</td>
<td>3 (6.5%)</td>
<td>1 (1.8%)</td>
<td>3 (7.1%)</td>
</tr>
<tr>
<td>3</td>
<td>5 (10.9%)</td>
<td>4 (7.1%)</td>
<td>3 (7.1%)</td>
</tr>
<tr>
<td>4</td>
<td>3 (6.5%)</td>
<td>2 (3.6%)</td>
<td>3 (7.1%)</td>
</tr>
<tr>
<td>5</td>
<td>4 (8.7%)</td>
<td>8 (14.3%)</td>
<td>4 (9.5%)</td>
</tr>
<tr>
<td>6</td>
<td>7 (15.2%)</td>
<td>13 (23.2%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>7</td>
<td>5 (10.9%)</td>
<td>7 (12.5%)</td>
<td>7 (16.7%)</td>
</tr>
<tr>
<td>8</td>
<td>10 (21.7%)</td>
<td>9 (16.1%)</td>
<td>4 (9.5%)</td>
</tr>
<tr>
<td>9</td>
<td>1 (2.2%)</td>
<td>3 (5.4%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>4 (8.7%)</td>
<td>4 (7.1%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>11</td>
<td>2 (4.3%)</td>
<td>2 (3.6%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>56</td>
<td>42</td>
</tr>
</tbody>
</table>

χ² = 15.696, NS; df = 10  χ² = 26.893*, df = 10  χ² = 7.048, NS; df = 9

Of the respondents in the group which had completed 5 or more courses to date, 4.3 percent ranked written objectives number 1 (most helpful), 6.5 percent ranked it number 2, 10.9 percent ranked it number 3, 6.5 percent ranked it number 4, 8.7 percent
ranked it number 5, 15.2 percent ranked it number 6, 10.9 percent ranked it number 7, 21.7 percent ranked it number 8, 2.2 percent ranked it number 9, 8.7 percent ranked it number 10, and 4.3 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, 5.4 percent ranked written objectives number 1, 1.8 percent ranked it number 2, 7.1 percent ranked it number 3, 3.6 percent ranked it number 4, 14.3 percent ranked it number 5, 23.2 percent ranked it number 6, 12.5 percent ranked it number 7, 16.1 percent ranked it number 8, 5.4 percent ranked it number 9, 7.1 percent ranked it number 10, and 3.6 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the group which was currently enrolled in their first course, 14.3 percent ranked written objectives number 1, 7.1 percent ranked it number 2, 7.1 percent ranked it number 3, 7.1 percent ranked it number 4, 9.5 percent ranked it number 5, 14.3 percent ranked it number 6, 16.7 percent ranked it number 7, 9.5 percent ranked it number 8, none ranked it number 9, 11.9 percent ranked it number 10, and 2.4 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the 1-4 group is significant. This indicates that for this group the observed distribution of responses in Table 48 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 49. Responses by recency of study to Question 20: Rank written objectives from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 ( 8.1%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>5 ( 4.0%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>3</td>
<td>11 ( 8.9%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>4</td>
<td>7 ( 5.6%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>5</td>
<td>14 (11.3%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>6</td>
<td>21 (16.9%)</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>7</td>
<td>18 (14.5%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>8</td>
<td>19 (15.3%)</td>
<td>4 (21.1%)</td>
</tr>
<tr>
<td>9</td>
<td>3 ( 2.4%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>10</td>
<td>12 ( 9.7%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>11</td>
<td>4 ( 3.2%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>19</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 34.435^*; \text{ df } = 10 \]

\[ \chi^2 = 9.947 \text{NS; df } = 9 \]

In the group which was currently studying at least one course, 8.1 percent ranked written objectives number 1 (most helpful), 4 percent ranked it number 2, 8.9 percent ranked it number 3, 5.6 percent ranked it number 4, 11.3 percent ranked it number 5, 16.9 percent ranked it number 6, 14.5 percent ranked it number 7, 15.3 percent ranked it number 8, 2.4 percent ranked it number 9, 9.7 percent ranked it number 10, and 3.2 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

In the group which was not currently studying but had studied within the past year, none ranked written objectives number 1, 10.5 percent ranked it number 2, 5.3 percent ranked it number 3, 5.3 percent ranked it number 4, 10.5 percent ranked it number 5, 26.3 percent ranked it number 6, 5.3 percent ranked it number 7, 21.1 percent ranked it number 8, 5.3 percent ranked it number 9, 5.3 percent ranked it number 10, and 5.3 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in Table 49 departs
significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section 6: Information/question Data

For Question 10, respondents were to locate on a Likert scale their perception of the helpfulness of the amount of information presented before a study question is asked in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 50 – 55.

Table 50. Responses to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>51</td>
<td>33.6</td>
</tr>
<tr>
<td>Agree</td>
<td>82</td>
<td>53.9</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>18</td>
<td>11.8</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2 = 101.947*; \text{ df } = 3$

In the chi-square goodness-of-fit test reported in Table 50, a theoretical distribution of expected frequency of 38.0 per response category was used for comparison purposes. With 3 degrees of freedom, a critical chi-square value of 7.815 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 152 respondents to question 10, one-third (33.6 percent) strongly agreed that the amount of information presented before a study question is asked helped them succeed in their courses, and slightly over one-half (53.9 percent) agreed with the statement. In addition, 18 (11.8 percent) were neutral, while only 1 respondent (0.7 percent) disagreed with the
statement. None strongly disagreed. The observed chi-square value of 101.947 shows that
the observed distribution of responses in Table 50 departs significantly from the
distribution of responses expected under the condition of the hypothesis of no differences
in the numbers of responses per response category.

Table 51. Responses by gender to Question 10: The amount of information presented
before a study question is asked helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>101</td>
<td>36 (35.6%)</td>
<td>53 (52.5%)</td>
<td>12 (11.9%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>25.208*; df=2</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>15 (29.4%)</td>
<td>29 (56.9%)</td>
<td>6 (11.8%)</td>
<td>1 (2.0%)</td>
<td>0 (0.0%)</td>
<td>35.510*; df=3</td>
</tr>
</tbody>
</table>

Of the male respondents, slightly over one-third (35.6 percent) strongly agreed
that the amount of information presented before a study question is asked helped them
succeed in their courses. Another 52.5 percent agreed. 11.9 percent were neutral, and
none chose either of the disagree options. The calculated chi-square value is significant.

Of the female respondents, 29.4 percent strongly agreed that the amount of
information presented before a study question is asked helped them succeed in their
courses. Another 56.9 percent agreed. 11.8 percent were neutral and 1 (2.0 percent)
disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that the
observed distribution of responses in Table 51 departs significantly from the distribution
of responses expected under the condition of the hypothesis of no differences in the
numbers of responses per response category.
Table 52. Responses by age to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>17 (37.8%)</td>
<td>23 (51.1%)</td>
<td>5 (11.1%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>11.200*; df=2</td>
</tr>
<tr>
<td>30-39</td>
<td>50</td>
<td>20 (40.0%)</td>
<td>23 (46.0%)</td>
<td>7 (14.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>8.680*; df=2</td>
</tr>
<tr>
<td>40-49</td>
<td>43</td>
<td>9 (20.9%)</td>
<td>28 (65.1%)</td>
<td>5 (11.6%)</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>39.884*; df=3</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>5 (35.7%)</td>
<td>8 (57.1%)</td>
<td>1 (7.1%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>5.286NS; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 group, 37.8 percent strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 51.1 percent agreed. 11.1 percent were neutral. None chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, 40.0 percent strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 46.0 percent agreed. 14.0 percent were neutral. None chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 20.9 percent strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 65.1 percent. 11.6 percent were neutral and 1 (2.3 percent) disagreed. None strongly disagreed with the statement. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, 35.7 percent strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 57.1 percent agreed. 1 (7.1 percent) was neutral, and none chose either of the disagree options. The calculated chi-square value is not significant.
The chi-square tests for all groups except the 50 or over group are significant. This indicates that for these groups the observed distribution of responses in Table 52 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 53. Responses by ethnic background to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backg’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>3 (50.0%)</td>
<td>3 (50.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.000NS; df=1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>124</td>
<td>40 (32.3%)</td>
<td>69 (55.6%)</td>
<td>14 (11.3%)</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
<td>87.548*; df=3</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>2 (40.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.200NS; df=1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>4 (33.3%)</td>
<td>8 (66.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1.333NS; df=1</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, 3 (50.0 percent) strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 3 (50.0 percent) agreed. None were neutral and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, slightly less than one-third (32.3 percent) strongly agreed that the amount of information presented before a study question is asked helped them succeed in their courses. Another 55.6 percent agreed. 11.3 percent were neutral and 1 (0.8 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 2 (40.0 percent) agreed. None were neutral and none chose either of the disagree options. The calculated chi-square value is not significant.
Of the Hispanic respondents, 4 (33.3 percent) strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 8 (66.7 percent) agreed. None were neutral and none chose either of the disagree options. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 53 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 54. Responses by number of courses completed to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=5</td>
<td>49</td>
<td>16 (32.7%)</td>
<td>28 (57.1%)</td>
<td>5 (10.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>16.204*; df=2</td>
</tr>
<tr>
<td>1-4</td>
<td>59</td>
<td>20 (33.9%)</td>
<td>30 (50.8%)</td>
<td>8 (13.6%)</td>
<td>1 (1.7%)</td>
<td>0 (0.0%)</td>
<td>33.542*; df=3</td>
</tr>
<tr>
<td>1\textsuperscript{st} Course</td>
<td>44</td>
<td>15 (34.1%)</td>
<td>24 (54.5%)</td>
<td>5 (11.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>12.318*; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed at least five courses, slightly less than one-third (32.7 percent) strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 57.1 percent agreed. 10.2 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses, slightly more than one-third (33.9 percent) strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 50.8 percent agreed. 13.6 percent were neutral and 1 (1.7 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.
Of the respondents in the group which was enrolled in their first course, slightly more than one third (34.1 percent) strongly agreed that the amount of information presented before a study question was asked helped them succeed in their course. Another 54.5 percent agreed. 11.4 percent were neutral. None chose either of the disagree options. The calculated chi-square value is significant.

The chi-square tests for all groups are significant. This indicates that the observed distribution of responses in Table 54 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 55. Responses by recency of study to Question 10: The amount of information presented before a study question is asked helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently Studying</td>
<td>128</td>
<td>42 (32.8%)</td>
<td>71 (55.5%)</td>
<td>15 (11.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>36.766*;</td>
<td>2</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>21</td>
<td>6 (28.6%)</td>
<td>11 (52.4%)</td>
<td>3 (14.3%)</td>
<td>1 (4.8%)</td>
<td>0 (0.0%)</td>
<td>10.810*;</td>
<td>3</td>
</tr>
</tbody>
</table>

Of the respondents in the group which was currently studying at least one course, slightly less than one-third (32.8 percent) strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses. Another 55.5 percent agreed. 11.7 percent were neutral. None chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, 28.6 percent strongly agreed that the amount of information presented before a study question was asked helped them succeed in their courses.
Another 52.4 percent agreed. 14.3 percent were neutral and 1 (4.8 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both groups are significant. This indicates that the observed distribution of responses in Table 55 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Question 21 was a parallel to Question 10 (“The amount of information presented before a study question is asked helped me succeed in the courses”). Whereas Question 10 responses were located on a Likert scale, Question 21 was part of a rank-order set in which the respondents ranked each of the eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus respondents were asked to rank the amount of information presented before a study question is asked between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 21 appear in Tables 56 – 61.
Table 56. Responses to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>11.8%</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>6.6%</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>7.9%</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>13.9%</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
<td>17.4%</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
<td>13.2%</td>
</tr>
<tr>
<td>7</td>
<td>19</td>
<td>13.2%</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>7.6%</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>4.2%</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>2.8%</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>0.7%</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

\( \chi^2 = 43.458^*; \) df = 10

In the chi-square goodness-of-fit test reported in Table 56, a theoretical distribution of expected frequencies of 13.1 per response category was used for comparison purposes. With 10 degrees of freedom, a critical chi-square value of 18.307 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 144 respondents to Question 21, 11.8 percent ranked the amount of information presented before a study question is asked at number 1 (most helpful), 6.6 percent ranked it number 2, 7.9 percent ranked it number 3, 13.9 percent ranked it number 4, 17.4 percent ranked it number 5, 13.2 percent ranked it number 6, 13.2 percent ranked it number 7, 7.6 percent ranked it number 8, 4.2 percent ranked it number 9, 2.8 percent ranked it number 10, and 0.7 percent ranked it number 11 (least helpful). The calculated chi-square value of 43.458 shows that the observed distribution of responses in Table 56 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 57. Responses by gender to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 (10.4%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>2</td>
<td>7 ( 7.3%)</td>
<td>3 ( 6.3%)</td>
</tr>
<tr>
<td>3</td>
<td>9 ( 9.4%)</td>
<td>3 ( 6.3%)</td>
</tr>
<tr>
<td>4</td>
<td>16 (16.7%)</td>
<td>4 ( 8.3%)</td>
</tr>
<tr>
<td>5</td>
<td>15 (15.6%)</td>
<td>10 (20.8%)</td>
</tr>
<tr>
<td>6</td>
<td>13 (13.5%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>7</td>
<td>12 (12.5%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>8</td>
<td>5 ( 5.2%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>9</td>
<td>6 ( 6.3%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>2 ( 2.1%)</td>
<td>2 ( 4.2%)</td>
</tr>
<tr>
<td>11</td>
<td>1 ( 1.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>48</td>
</tr>
</tbody>
</table>

$\chi^2=28.896^*; \text{df}=10$ $\chi^2=9.750\text{NS}; \text{df}=8$

Of the male respondents, 10.4 percent ranked the amount of information presented before a study question is asked number 1 (most helpful), 7.3 percent ranked it number 2, 9.4 percent ranked it number 3, 16.7 percent ranked it number 4, 15.6 percent ranked it number 5, 13.5 percent ranked it number 6, 12.5 percent ranked it number 7, 5.2 percent ranked it number 8, 6.3 percent ranked it number 9, 2.1 percent ranked it number 10, and 1 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the female respondents, 14.6 percent ranked the amount of information presented before a study question is asked number 1, 6.3 percent ranked it number 2, 6.3 percent ranked it number 3, 8.3 percent ranked it number 4, 20.8 percent ranked it number 5, 12.5 percent ranked it number 6, 14.6 percent ranked it number 7, 12.5 percent ranked it number 8, none ranked it number 9, 4.2 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.
Only the chi-square test for the male group is significant. This indicates that the observed distribution of responses in Table 57 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 58. Responses by age to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 (11.4%)</td>
<td>6 (13.0%)</td>
<td>3 (7.5%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>2</td>
<td>3 (6.8%)</td>
<td>3 (6.5%)</td>
<td>2 (5.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>3</td>
<td>2 (4.5%)</td>
<td>7 (15.2%)</td>
<td>2 (5.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>4</td>
<td>7 (15.9%)</td>
<td>6 (13.0%)</td>
<td>5 (12.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>5</td>
<td>12 (27.3%)</td>
<td>7 (15.2%)</td>
<td>5 (12.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>6</td>
<td>2 (4.5%)</td>
<td>10 (21.7%)</td>
<td>6 (15.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>5 (11.4%)</td>
<td>2 (4.3%)</td>
<td>10 (25.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>8</td>
<td>5 (11.4%)</td>
<td>0 (0.0%)</td>
<td>4 (10.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>9</td>
<td>3 (6.8%)</td>
<td>2 (4.3%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>2 (4.3%)</td>
<td>2 (5.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>50</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

χ²=16.136*; df=8
χ²=17.478*; df=9
χ²=16.000NS; df=9
χ²=2.000NS; df=7

Of the respondents in the Under 30 age group, 11.4 percent ranked the amount of information presented before a study question is asked number 1 (most helpful), 6.8 percent ranked it number 2, 4.5 percent ranked it number 3, 15.9 percent ranked it number 4, 27.3 percent ranked it number 5, 4.5 percent ranked it number 6, 11.4 percent ranked it number 7, 11.6 percent ranked it number 8, 6.8 percent ranked it number 9, and none ranked it either number 10 or 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, 13.0 percent ranked the amount of information presented before a study question is asked number 1, 6.5 percent ranked it
number 2, 15.2 percent ranked it number 3, 13.0 percent ranked it number 4, 15.2 percent ranked it number 5, 21.7 percent ranked it number 6, 4.3 percent ranked it number 7, none ranked it number 8, 4.3 percent ranked it number 9, 4.3 percent ranked it number 10, and 2.2 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 7.5 percent ranked the amount of information presented before a study question is asked number 1, 5.0 percent ranked it number 2, 5.0 percent ranked it number 3, 12.5 percent ranked it number 4, 12.5 percent ranked it number 5, 15.0 percent ranked it number 6, one-fourth ranked it number 7, 10 percent ranked it number 8, 2.5 percent ranked it number 9, 5.0 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.

Of the respondents in the 50 or Over age group, 21.4 percent ranked the amount of information presented before a study question is asked number 1, 14.3 percent ranked it number 2, 7.1 percent ranked it number 3, 14.3 percent ranked it number 4, 7.1 percent ranked it number 5, 7.1 percent ranked it number 6, 14.3 percent ranked it number 7, 14.3 percent ranked it number 8, and none ranked it numbers 9, 10, or 11. The calculated chi-square value is not significant.

Only the chi-square tests for the Under 30 and the 30-39 age groups are significant. This indicates that for these two groups the observed distribution of responses in Table 58 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 59. Responses by ethnic background to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>16 (13.1%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>2</td>
<td>1 (20.0%)</td>
<td>8 (6.6%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>11 (9.0%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>4</td>
<td>1 (20.0%)</td>
<td>15 (12.3%)</td>
<td>1 (33.3%)</td>
<td>3 (30.0%)</td>
</tr>
<tr>
<td>5</td>
<td>1 (20.0%)</td>
<td>23 (18.9%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>0 (0.0%)</td>
<td>16 (13.1%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (20.0%)</td>
<td>14 (11.5%)</td>
<td>2 (66.7%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (20.0%)</td>
<td>9 (7.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 (0.0%)</td>
<td>5 (4.1%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>4 (3.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5 122 3 10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

χ²=0.000NS;df=4  χ²=37.590*;df=10  χ²=0.333NS;df=1  χ²=2.600NS;df=6

Of the American Indian respondents, 1 (20.0 percent) ranked the amount of information presented before a study question is asked number 2, 1 (20.0 percent) ranked it number 4, 1 (20.0 percent) ranked it number 5, 1 (20.0 percent) ranked it number 7, and 1 (20.0 percent) ranked it number 8. None ranked it lower than number 8. The calculated chi-square value is not significant.

Of the Caucasian respondents, 13.1 percent ranked the amount of information presented before a study question is asked number 1 (most helpful), 6.6 percent ranked it number 2, 9.0 percent ranked it number 3, 12.3 percent ranked it number 4, 18.9 percent ranked it number 5, 13.1 percent ranked it number 6, 11.5 percent ranked it number 7, 7.4 percent ranked it number 8, 4.1 percent ranked it number 9, 3.3 percent ranked it number 10, and 0.8 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.
Of the Black respondents, 1 (33.3 percent) ranked the amount of information presented before a study question is asked number 4 and 2 (66.7 percent) ranked it number 7. None ranked it either number 1 or number 11. None ranked it higher than number 4 or lower than number 7. The calculated chi-square value is not significant.

Of the Hispanic respondents, 1 (10.0 percent) ranked the amount of information presented before a study question is asked number 1, 1 (10.0 percent) ranked it number 2, 1 (10.0 percent) ranked it number 3, 3 (30.0 percent) ranked it number 4, none ranked it number 5, 2 (20.0 percent) ranked it number 6, 1 (10.0 percent) ranked it number 7, none ranked it number 8, 1 (10.0 percent) ranked it number 9, and none ranked it numbers 10 or 11. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 59 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 60. Responses by number of courses completed to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 (8.7%)</td>
<td>8 (14.3%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>2</td>
<td>4 (8.7%)</td>
<td>4 (7.1%)</td>
<td>2 (4.8%)</td>
</tr>
<tr>
<td>3</td>
<td>5 (10.9%)</td>
<td>2 (3.6%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>4</td>
<td>7 (15.2%)</td>
<td>6 (10.7%)</td>
<td>7 (16.7%)</td>
</tr>
<tr>
<td>5</td>
<td>4 (8.7%)</td>
<td>11 (19.6%)</td>
<td>10 (23.8%)</td>
</tr>
<tr>
<td>6</td>
<td>8 (17.4%)</td>
<td>9 (16.1%)</td>
<td>2 (4.8%)</td>
</tr>
<tr>
<td>7</td>
<td>6 (13.0%)</td>
<td>9 (16.1%)</td>
<td>4 (9.5%)</td>
</tr>
<tr>
<td>8</td>
<td>3 (6.5%)</td>
<td>6 (10.7%)</td>
<td>2 (4.8%)</td>
</tr>
<tr>
<td>9</td>
<td>3 (6.5%)</td>
<td>1 (1.8%)</td>
<td>2 (4.8%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>3 (7.1%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>56</td>
<td>42</td>
</tr>
</tbody>
</table>

χ² = 11.870 NS; df = 10

χ² = 14.714 NS; df = 8

χ² = 15.143 NS; df = 9

Of the respondents in the group which had completed at least 5 courses to date, 8.7 percent ranked the amount of information presented before a study question is asked number 1 (most helpful), 8.7 percent ranked it number 2, 10.9 percent ranked it number 3, 15.2 percent ranked it number 4, 8.7 percent ranked it number 5, 17.4 percent ranked it number 6, 13.0 percent ranked it number 7, 6.5 percent ranked it number 8, 6.5 percent ranked it number 9, 2.2 percent ranked it number 10, and 2.2 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, 14.3 percent ranked the amount of information presented before a study question is asked number 1, 7.1 percent ranked it number 2, 3.6 percent ranked it number 3, 10.7 percent ranked it number 4, 19.6 percent ranked it number 5, 16.1 percent ranked it number 6, 16.1 percent ranked it number 7, 10.7 percent ranked it number 8, 1.8 percent
ranked it number 9, and none ranked it numbers 10 or 11. The calculated chi-square value is not significant.

Of the respondents in the group which was studying their first course, 11.9 percent ranked the amount of information presented before a study question is asked number 1, 4.8 percent ranked it number 2, 11.9 percent ranked it number 3, 16.7 percent ranked it number 4, 23.8 percent ranked it number 5, 4.8 percent ranked it number 6, 9.5 percent ranked it number 7, 4.8 percent ranked it number 8, 4.8 percent ranked it number 9, 7.1 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.

None of the chi-square tests is significant. This indicates that the observed distribution of responses in Table 60 does not represent a significant departure from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 61. Responses by recency of study to Question 21: Rank the amount of information presented before a study question is asked from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15 (12.1%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>2</td>
<td>9 ( 7.3%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>3</td>
<td>11 ( 8.9%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>4</td>
<td>16 (12.9%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>5</td>
<td>19 (15.3%)</td>
<td>6 (31.6%)</td>
</tr>
<tr>
<td>6</td>
<td>17 (13.7%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>7</td>
<td>16 (12.9%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>8</td>
<td>10 ( 8.1%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>9</td>
<td>6 ( 4.8%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>4 ( 3.2%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>1 ( 0.8%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>19</td>
</tr>
</tbody>
</table>

χ²=30.532*, df=10  χ²=8.368NS, df=7

136
Of the respondents in the group which was currently studying at least one course, 12.1 percent ranked the amount of information presented before a study question is asked number 1 (most helpful), 7.3 percent ranked it number 2, 8.9 percent ranked it number 3, 12.9 percent ranked it number 4, 15.3 percent ranked it number 5, 13.7 percent ranked it number 6, 12.9 percent ranked it number 7, 8.1 percent ranked it number 8, 4.8 percent ranked it number 9, 3.2 percent ranked it number 10, and 0.8 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, 10.5 percent ranked the amount of information presented before a study question is asked number 1, 5.3 percent ranked it number 2, 5.3 percent ranked it number 3, 15.8 percent ranked it number 4, 31.6 percent ranked it number 5, 10.5 percent ranked it number 6, 15.8 percent ranked it number 7, 5.3 percent ranked it number 8, and none ranked it numbers 9, 10, or 11. The calculated chi-square value is not significant.

Only the chi-square test for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in Table 61 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section 7: Typographical Data

For Question 11, respondents were to locate on a Likert scale their perception of the helpfulness of the differences in typographical features in distance education materials published by Global University. The response categories for the question were
strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 62 – 67.

Table 62. Responses to Question 11: The differences in type helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>29</td>
<td>19.2</td>
</tr>
<tr>
<td>Agree</td>
<td>74</td>
<td>49.0</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>41</td>
<td>27.2</td>
</tr>
<tr>
<td>Disagree</td>
<td>6</td>
<td>4.0</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2 = 115.060^*; \ df = 4$

In the chi-square goodness-of-fit test reported in Table 62, a theoretical distribution of expected frequency of 30.2 per response category was used for comparison purposes. With 4 degrees of freedom, a critical chi-square value of 9.488 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 151 respondents to Question 11, 19.2 percent strongly agreed that typographical differences helped them succeed in their courses while almost one-half (49 percent) agreed with the statement. Slightly more than one-fourth (27.2 percent) were neutral in their opinion, 4 percent disagreed, and only 1 respondent (0.7 percent) strongly disagreed. The observed chi-square value of 115.060 shows that the observed distribution of responses in Table 62 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 63. Responses by gender to Question 11: The differences in type helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>100</td>
<td>16 (16.0%)</td>
<td>49 (49.0%)</td>
<td>29 (29.0%)</td>
<td>5 (5.0%)</td>
<td>1 (1.0%)</td>
<td>76.200*; df=4</td>
</tr>
<tr>
<td>Female</td>
<td>51</td>
<td>13 (25.5%)</td>
<td>25 (49.0%)</td>
<td>12 (23.5%)</td>
<td>1 (2.0%)</td>
<td>0 (0.0%)</td>
<td>22.647*; df=3</td>
</tr>
</tbody>
</table>

Of the male respondents, 16.0 percent strongly agreed that typographical features helped them succeed in their courses. Another 49.0 percent agreed. 29.0 percent were neutral, 5.0 percent disagreed with the statement, and 1 (1.0 percent) strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, slightly more than one-fourth (25.5 percent) strongly agreed that typographical features helped them succeed in their courses. Another 49.0 percent agreed. 23.5 percent were neutral and 1 (2.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both groups are significant. This indicates that for these groups the observed distribution of responses in Table 63 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 64. Responses by age to Question 11: The differences in type helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>44</td>
<td>10 (22.7%)</td>
<td>18 (40.9%)</td>
<td>14 (31.8%)</td>
<td>2 (4.5%)</td>
<td>0 (0.0%)</td>
<td>12.727*; df=3</td>
</tr>
<tr>
<td>30-39</td>
<td>50</td>
<td>11 (22.0%)</td>
<td>22 (44.0%)</td>
<td>14 (28.0%)</td>
<td>2 (4.0%)</td>
<td>1 (2.0%)</td>
<td>30.600*; df=4</td>
</tr>
<tr>
<td>40-49</td>
<td>43</td>
<td>8 (18.6%)</td>
<td>23 (53.5%)</td>
<td>10 (23.3%)</td>
<td>2 (4.7%)</td>
<td>0 (0.0%)</td>
<td>21.837*; df=3</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>0 (0.0%)</td>
<td>11 (78.6%)</td>
<td>3 (21.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>4.571*; df=1</td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 age group, 22.7 percent strongly agreed that typographical features helped them succeed in the courses. Another 40.9 percent agreed.
31.8 percent were neutral and 4.5 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, 22.0 percent strongly agreed that typographical features helped them succeed in their courses. Another 44.0 percent agreed. 28.0 percent were neutral, 4.0 percent disagreed, and 1 respondent (2.0 percent) strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 18.6 percent strongly agreed that typographical features helped them succeed in their courses. Another 53.5 percent agreed. 23.3 percent were neutral and 2 respondents (4.7 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, none strongly agreed that typographical features helped them succeed in their courses. More than three-fourths (78.6 percent) agreed. 21.4 percent were neutral. None chose either of the disagree options. The calculated chi-square value is significant.

The chi-square tests for all age groups are significant. This indicates that for these groups the observed distribution of responses in Table 64 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 65. Responses by ethnic background to Question 11: The differences in type helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>1 (16.7%)</td>
<td>4 (66.7%)</td>
<td>1 (16.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>3.000NS; df=2</td>
</tr>
<tr>
<td>Caucasian</td>
<td>123</td>
<td>23 (18.7%)</td>
<td>59 (48.0%)</td>
<td>37 (30.1%)</td>
<td>4 (3.3%)</td>
<td>0 (0.0%)</td>
<td>52.447*; df=3</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>2 (40.0%)</td>
<td>2 (40.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.400NS; df=2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>1 ( 8.3%)</td>
<td>7 (58.3%)</td>
<td>3 (25.0%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>8.000*; df=3</td>
</tr>
</tbody>
</table>
Of the American Indian respondents, 1 (16.7 percent) strongly agreed that typographical features helped them succeed in their courses. Another 4 (66.7 percent) agreed. 1 (16.7 percent) was neutral. None chose either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, 18.7 percent strongly agreed that typographical features helped them succeed in their courses. Another 48.0 percent agreed. 30.1 percent were neutral and 4 (3.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents, 2 (40.0 percent) strongly agreed that typographical features helped them succeed in their courses. Another 40.0 percent agreed. 1 (20.0 percent) was neutral. None chose either of the disagree options. The calculated chi-square value is not significant.

Of the Hispanic respondents, 8.3 percent strongly agreed that typographical features helped them succeed in their courses. Another 58.3 percent agreed. One-fourth were neutral and 1 (8.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Only the chi-square tests for the Caucasian and Hispanic groups are significant. This indicates that for these groups the observed distribution of responses in Table 65 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 66. Responses by number of courses completed to Question 11: The differences in type helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>=&gt;5</td>
<td>49</td>
<td>9 (18.4%)</td>
<td>27 (55.1%)</td>
<td>10 (20.4%)</td>
<td>3 (6.1%)</td>
<td>0 (0.0%)</td>
<td>26.020*; df=3</td>
</tr>
<tr>
<td>1-4</td>
<td>58</td>
<td>12 (20.7%)</td>
<td>29 (50.0%)</td>
<td>14 (24.1%)</td>
<td>2 (3.4%)</td>
<td>1 (1.7%)</td>
<td>44.241*; df=4</td>
</tr>
<tr>
<td>1st Course</td>
<td>44</td>
<td>8 (18.2%)</td>
<td>18 (40.9%)</td>
<td>17 (38.6%)</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>17.636*; df=3</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed at least 5 courses to date, 18.4 percent strongly agreed that typographical features helped them succeed in their courses. Another 55.1 percent agreed, 20.4 percent were neutral and 6.1 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, 20.7 percent strongly agreed that typographical features helped them succeed in their courses. Another 50.0 percent agreed. Slightly less than one-fourth (24.1 percent) were neutral, 3.4 percent disagreed, and 1.7 percent strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in its first course, 18.2 percent strongly agreed that typographical features helped them succeed in their course. Another 40.9 percent agreed. 38.6 percent were neutral and 1 (2.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for all groups are significant. This indicates that for these groups the observed distribution of responses in Table 66 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 67. Responses by recency of study to Question 11: The differences in type helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently Studying</td>
<td>127</td>
<td>24 (18.9%)</td>
<td>67 (52.8%)</td>
<td>33 (26.0%)</td>
<td>3 (2.4%)</td>
<td>0 (0.0%)</td>
<td>67.110*; df=3</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>21</td>
<td>4 (19.0%)</td>
<td>6 (28.6%)</td>
<td>7 (33.3%)</td>
<td>3 (14.3%)</td>
<td>1 (4.8%)</td>
<td>5.429NS; df=4</td>
</tr>
</tbody>
</table>

Of the respondents in the group which was currently studying at least one course, 18.9 percent strongly agreed that typographical features helped them succeed in their courses. Another 52.8 percent agreed. Slightly more than one-fourth (26.0 percent) were neutral and 3 (2.4 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past year, 19.0 percent strongly agreed that typographical features helped them succeed in their courses. Another 28.6 percent agreed with the statement. One-third were neutral, 3 (14.3 percent) disagreed, and 1 (4.8 percent) strongly disagreed. The calculated chi-square value is not significant.

Only the chi-square test for the currently studying group is significant. This indicates that for this group the observed distribution of responses in Table 67 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Question 22 was a parallel to Question 11 (“The differences in type helped me succeed in the courses”). Whereas Question 11 responses were located on a Likert scale, Question 22 was part of a rank-order set in which the respondents ranked each of the
eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus respondents were asked to rank the differences in type between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 22 appear in Tables 68 – 73.

Table 68. Responses to Question 22: Rank the differences in type between 1 and 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>8.4</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>11.9</td>
</tr>
<tr>
<td>8</td>
<td>15</td>
<td>10.5</td>
</tr>
<tr>
<td>9</td>
<td>29</td>
<td>20.3</td>
</tr>
<tr>
<td>10</td>
<td>34</td>
<td>23.8</td>
</tr>
<tr>
<td>11</td>
<td>20</td>
<td>14.0</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 76.650^*; \text{ df } = 9 \]

In the chi-square goodness-of-fit test reported in Table 68, a theoretical distribution of expected frequencies of 14.3 per response category was used for comparison purposes. With 9 degrees of freedom, a critical chi-square value of 16.919 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 143 respondents to Question 22, none ranked typographical features number 1 (most helpful), 2.1 percent ranked it number 2, 2.1 percent ranked it number 3, 1.4 percent ranked it number 4, 5.6 percent ranked it number 5, 8.4 percent ranked it number 6, 11.9 percent ranked it number 7, 10.5 percent ranked it number 8, 20.3 percent ranked it number 9, 23.8 percent ranked it number 10, and 14.0 percent ranked it number 11 (least helpful). The calculated chi-square value of 76.650 shows that the observed distribution
of responses in Table 68 departs significantly from the distribution of responses expected
under the condition of the hypothesis of no differences in the numbers of responses per
response category.

Table 69. Responses by gender to Question 22: Rank the differences in type between 1
and 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>1 (1.1%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (1.1%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>4</td>
<td>1 (1.1%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>5</td>
<td>6 (6.3%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>6</td>
<td>6 (6.3%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>7</td>
<td>12 (12.6%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>8</td>
<td>10 (10.5%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>9</td>
<td>22 (23.2%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>10</td>
<td>21 (22.1%)</td>
<td>13 (27.1%)</td>
</tr>
<tr>
<td>11</td>
<td>15 (15.8%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>95</td>
<td>48</td>
</tr>
</tbody>
</table>

\[ \chi^2=59.632^*; \text{ df}=9 \]
\[ \chi^2=23.250^*; \text{ df}=9 \]

Of the male respondents, none ranked typographical features number 1 (most
helpful), 1.1 percent ranked it number 2, 1.1 percent ranked it number 3, 1.1 percent
ranked it number 4, 6.3 percent ranked it number 5, 6.3 percent ranked it number 6, 12.6
percent ranked it number 7, 10.5 percent ranked it number 8, 23.2 percent ranked it
number 9, 22.1 percent ranked it number 10, and 15.8 percent ranked it number 11 (least
helpful. The calculated chi-square value is significant.

Of the female respondents, none ranked typographical features number 1, 4.2
percent ranked it number 2, 4.2 percent ranked it number 3, 2.1 percent ranked it number
4, 4.2 percent ranked it number 5, 12.5 percent ranked it number 6, 10.4 percent ranked it
number 7, 10.4 percent ranked it number 8, 14.6 percent ranked it number 9, 27.1 percent
ranked it number 10, and 10.4 percent ranked it number 11. The calculated chi-square value for this group is significant.

The chi-square tests for both groups are significant. This indicates that for these two groups the observed distribution of responses in Table 69 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 70. Responses by age to Question 22: Rank the differences in type between 1 and 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>1 (2.3%)</td>
<td>1 (2.2%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>3 (7.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>2 (5.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>3 (7.0%)</td>
<td>2 (4.3%)</td>
<td>2 (5.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>6</td>
<td>4 (9.3%)</td>
<td>6 (13.0%)</td>
<td>2 (5.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>7</td>
<td>8 (18.6%)</td>
<td>4 (8.7%)</td>
<td>2 (5.0%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>8</td>
<td>2 (4.7%)</td>
<td>6 (13.0%)</td>
<td>5 (12.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>9</td>
<td>8 (18.6%)</td>
<td>10 (21.7%)</td>
<td>9 (22.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>10</td>
<td>8 (18.6%)</td>
<td>11 (23.9%)</td>
<td>11 (27.5%)</td>
<td>4 (28.6%)</td>
</tr>
<tr>
<td>11</td>
<td>6 (14.0%)</td>
<td>6 (13.0%)</td>
<td>6 (15.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>46</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

χ² = 12.884NS; χ² = 14.870*; χ² = 23.000*; χ² = 2.286NS; df=8; df=7; df=8; df=5

Of the respondents in the Under 30 age group, none ranked typographical features number 1 (most helpful), 2.3 percent ranked it number 2, 7 percent ranked it number 3, none ranked it number 4, 7 percent ranked it number 5, 9.3 percent ranked it number 6, 18.6 percent ranked it number 7, 4.7 percent ranked it number 8, 18.6 percent ranked it number 9, 18.6 percent ranked it number 10, and 14.0 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.
Of the respondents in the 30-39 age group, none ranked typographical features number 1, 2.2 percent ranked it number 2, none ranked it number 3 or 4, 4.3 percent ranked it number 5, 13 percent ranked it number 6, 8.7 percent ranked it number 7, 13.0 percent ranked it number 8, 21.7 percent ranked it number 9, 23.9 percent ranked it number 10, and 13.0 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, none ranked typographical features number 1, 2.5 percent ranked it number 2, none ranked it number 3, 5.0 percent ranked it number 4, 5.0 percent ranked it number 5, 5.0 percent ranked it number 6, 5.0 percent ranked it number 7, 12.5 percent ranked it number 8, 22.5 percent ranked it number 9, 27.5 percent ranked it number 10, and 15.0 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, none ranked typographical features number 1, 2, 3, or 4, 7.1 percent ranked it number 5, none ranked it number 6, 21.4 percent ranked it number 7, 14.3 percent ranked it number 8, 14.3 percent ranked it number 9, 28.6 percent ranked it number 10, and 14.3 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square tests for the 30-39 and 40-49 age groups are significant. This indicates that for these two groups the observed distribution of responses in Table 70 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 71. Responses by ethnic background to Question 22: Rank the differences in type between 1 and 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>3 (2.5%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>3 (2.5%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 (0.0%)</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 (0.0%)</td>
<td>7 (5.8%)</td>
<td>1 (33.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>0 (0.0%)</td>
<td>9 (7.4%)</td>
<td>1 (33.3%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (20.0%)</td>
<td>13 (10.7%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>8</td>
<td>0 (0.0%)</td>
<td>15 (12.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 (0.0%)</td>
<td>27 (22.3%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>10</td>
<td>2 (40.0%)</td>
<td>28 (23.1%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>11</td>
<td>2 (40.0%)</td>
<td>15 (12.4%)</td>
<td>1 (33.3%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>121</td>
<td>3</td>
<td>12</td>
</tr>
</tbody>
</table>

$\chi^2=0.400$ NS; df=2  $\chi^2=67.512^*; df=9$  $\chi^2=0.000$ NS; df=2  $\chi^2=0.000$ NS; df=4

Of the American Indian respondents, 1 (20.0 percent) ranked typographical features number 7, 2 (40.0 percent) ranked it number 10, and 2 (40.0 percent) ranked it number 11 (least helpful). None ranked the item higher than number 7. The calculated chi-square value is not significant.

Of the Caucasian respondents, none ranked typographical features number 1 (most helpful), 2.5 percent ranked it number 2, 2.5 percent ranked it number 3, 0.8 percent ranked it number 4, 5.8 percent ranked it number 5, 7.4 percent ranked it number 6, 10.7 percent ranked it number 7, 12.4 percent ranked it number 8, 22.3 percent ranked it number 9, 23.1 percent ranked it number 10, and 12.4 percent ranked it number 11. The calculated chi-square value is significant.

Of the Black respondents, 1 (33.3 percent) ranked typographical features number 5, 1 (33.3 percent) ranked it number 6, and 1 (33.3 percent) ranked it number 11. None ranked the item higher than number 5. The calculated chi-square value is not significant.
Of the Hispanic respondents, 2 (20.0 percent) ranked typographical features number 6, 2 (20.0 percent) ranked it number 7, 2 (20.0 percent) ranked it number 9, 2 (20.0 percent) ranked it number 10, and 2 (20.0 percent) ranked it number 11. None ranked the item higher than number 6. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 71 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 72. Responses by number of courses completed to Question 22: Rank the differences in type between 1 and 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>1 (1.8%)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td>4</td>
<td>1 (2.2%)</td>
<td>1 (1.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>1 (2.2%)</td>
<td>6 (10.7%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>6</td>
<td>4 (8.7%)</td>
<td>6 (10.7%)</td>
<td>2 (4.9%)</td>
</tr>
<tr>
<td>7</td>
<td>7 (15.2%)</td>
<td>6 (10.7%)</td>
<td>4 (9.8%)</td>
</tr>
<tr>
<td>8</td>
<td>5 (10.9%)</td>
<td>7 (12.5%)</td>
<td>3 (7.3%)</td>
</tr>
<tr>
<td>9</td>
<td>11 (23.9%)</td>
<td>11 (19.6%)</td>
<td>7 (17.1%)</td>
</tr>
<tr>
<td>10</td>
<td>11 (23.9%)</td>
<td>10 (17.9%)</td>
<td>13 (31.7%)</td>
</tr>
<tr>
<td>11</td>
<td>5 (10.9%)</td>
<td>8 (14.3%)</td>
<td>7 (17.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>56</td>
<td>41</td>
</tr>
</tbody>
</table>

χ²=24.435*;df=8  χ²=15.357NS;df=8  χ²=25.951*;df=8

Of the respondents in the group which had completed 5 or more courses to date, none ranked typographical features number 1 (most helpful) or number 2, 2.2 percent ranked it number 3, 2.2 percent ranked it number 4, 2.2 percent ranked it number 5, 8.7 percent ranked it number 6, 15.2 percent ranked it number 7, 10.9 percent ranked it
number 8, 23.9 percent ranked it number 9, 23.9 percent ranked it number 10, and 10.9 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, none ranked it number 1, 1.8 percent ranked it number 2, none ranked it number 3, 1.8 percent ranked it number 4, 10.7 percent ranked it number 5, 10.7 percent ranked it number 6, 10.7 percent ranked it number 7, 12.5 percent ranked it number 8, 19.6 percent ranked it number 9, 17.9 percent ranked it number 10, and 14.3 percent ranked it number 11. The calculated chi-square value is not significant.

Of the respondents in the group which was enrolled in their first course, none ranked typographical features number 1, 4.9 percent ranked it number 2, 4.9 percent ranked it number 3, none ranked it number 4, 2.4 percent ranked it number 5, 4.9 percent ranked it number 6, 9.8 percent ranked it number 7, 7.3 percent ranked it number 8, 17.1 percent ranked it number 9, 31.7 percent ranked it number 10, and 17.1 percent ranked it number 11. The calculated chi-square value is significant.

Only the chi-square tests for the 5 or More and Currently Enrolled in First Course groups are significant. This indicates that for these groups the observed distribution of responses in Table 72 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 73. Responses by recency of study to Question 22: Rank the differences in type between 1 and 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>3 ( 2.4%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>3 ( 2.4%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>2 ( 1.6%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>7 ( 5.7%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>6</td>
<td>10 ( 8.1%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>7</td>
<td>14 (11.4%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>8</td>
<td>14 (11.4%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>9</td>
<td>25 (19.5%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>10</td>
<td>30 (24.4%)</td>
<td>4 (21.1%)</td>
</tr>
<tr>
<td>11</td>
<td>15 (12.2%)</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>19</td>
</tr>
</tbody>
</table>

$\chi^2 = 65.049^*; \text{ df}=9$ $\chi^2 = 4.947\text{NS}; \text{ df}=6$

Of the respondents in the group which was currently studying at least one course, none ranked typographical features number 1 (most helpful), 2.4 percent ranked it number 2, 2.4 percent ranked it number 3, 1.6 percent ranked it number 4, 5.7 percent ranked it number 5, 8.1 percent ranked it number 6, 11.4 percent ranked it number 7, 11.4 percent ranked it number 8, 20.3 percent ranked it number 9, almost one-fourth (24.4 percent) ranked it number 10, and 12.2 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying a course but had studied within the previous year, none ranked typographical features higher than number 5, 5.3 percent ranked it number 5, 10.5 percent ranked it number 6, 15.8 percent ranked it number 7, 5.3 percent ranked it number 8, 15.8 percent ranked it number 9, 21.1 percent ranked it number 10, and slightly more than one-fourth (26.3 percent) ranked it number 11. The calculated chi-square value is not significant.
Only the chi-square test for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in Table 73 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section 8: Graphic Art Data

For Question 10, respondents were to locate on a Likert scale their perception of the helpfulness of the graphic art in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 74 – 79.

Table 74. Responses to Question 12: Graphic art helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>35</td>
<td>23.3</td>
</tr>
<tr>
<td>Agree</td>
<td>77</td>
<td>51.3</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>33</td>
<td>22.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>2</td>
<td>1.3</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 125.200*; df = 4

In the chi-square goodness-of-fit test reported in Table 74, a theoretical distribution of expected frequency of 30.0 per response category was used for comparison purposes. With 4 degrees of freedom, a critical chi-square value of 9.488 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 150 respondents to Question 12, slightly less than one-fourth (23.3 percent) strongly agreed that graphic art helped them succeed in their courses, while slightly over one-half (51.3 percent) agreed with the statement. In addition, 33 respondents (21.7 percent) were
neutral, 3 (2 percent) disagreed, and 2 (1.3 percent) strongly disagreed. The observed chi-square value of 125.200 shows that the observed distribution of responses in Table 74 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 75. Responses by gender to Question 12: Graphic art helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>100</td>
<td>22 (22.0%)</td>
<td>51 (51.0%)</td>
<td>22 (22.0%)</td>
<td>3 (3.0%)</td>
<td>2 (2.0%)</td>
<td>79.100*; df=4</td>
</tr>
<tr>
<td>Female</td>
<td>50</td>
<td>13 (26.0%)</td>
<td>26 (52.0%)</td>
<td>11 (22.0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>7.960*; df=2</td>
</tr>
</tbody>
</table>

Of the male respondents, 22.0 percent strongly agreed that graphic art helped them succeed in their courses. Another 51.0 percent agreed. 22.0 percent were neutral, 3.0 percent disagreed, and 2.0 percent strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, 26.0 percent strongly agreed that graphic art helped them succeed in their courses. Another 52.0 percent agreed. 22.0 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that for these groups the observed distribution of responses in Table 75 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 76. Responses by age to Question 12: Graphic art helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>11 (24.4%)</td>
<td>25 (55.6%)</td>
<td>8 (17.8%)</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>27.089*; df=3</td>
</tr>
<tr>
<td>30-39</td>
<td>49</td>
<td>11 (22.4%)</td>
<td>25 (51.0%)</td>
<td>10 (20.4%)</td>
<td>1 (2.0%)</td>
<td>2 (4.1%)</td>
<td>37.837*; df=4</td>
</tr>
<tr>
<td>40-49</td>
<td>42</td>
<td>11 (26.2%)</td>
<td>19 (45.2%)</td>
<td>11 (26.2%)</td>
<td>1 (2.4%)</td>
<td>0 (0.0%)</td>
<td>15.524*; df=3</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>2 (14.3%)</td>
<td>8 (57.1%)</td>
<td>4 (28.6%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>4.000NS; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 age group, slightly less than one-fourth (24.4 percent) strongly agreed that graphic art helped them succeed in their courses. Another 55.6 percent agreed with the statement. 17.8 percent were neutral and 2.2 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, 22.4 percent strongly agreed that graphic art helped them succeed in their courses. Another 51.0 percent agreed with the statement. 20.4 percent were neutral, 1 respondent (2.0 percent) disagreed, and 2 respondents (4.1 percent) strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, slightly over one-fourth (26.2 percent) strongly agreed that graphic art helped them succeed in their courses. Another 45.2 percent agreed with the statement. Slightly over one-fourth (28.6 percent) were neutral, and only 1 respondent (2.4 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, 14.3 percent strongly agreed that graphic art helped them succeed in their courses. More than one-half (57.1 percent) agreed with the statement. 28.6 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is not significant.
The chi-square tests for all groups except the 50 or Over group are significant. This indicates that for these groups the observed distribution of responses in Table 76 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 77. Responses by ethnic background to Question 12: Graphic art helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>1 (16.7%)</td>
<td>4 (66.7%)</td>
<td>1 (16.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>3.000NS; df=2</td>
</tr>
<tr>
<td>Caucasian</td>
<td>123</td>
<td>30 (24.4%)</td>
<td>61 (49.6%)</td>
<td>30 (24.4%)</td>
<td>1 (0.8%)</td>
<td>1 (0.8%)</td>
<td>101.512*; df=4</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (20.0%)</td>
<td>1.600NS; df=2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>11</td>
<td>0 (0.0%)</td>
<td>9 (81.8%)</td>
<td>1 (9.1%)</td>
<td>1 (9.1%)</td>
<td>0 (0.0%)</td>
<td>11.636*; df=2</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, 1 (16.7 percent) strongly agreed that graphic art helped them succeed in their courses. Another 66.7 percent agreed. 1 (16.7 percent) was neutral, and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, slightly less than one-fourth (24.4 percent) strongly agreed that graphic art helped them succeed in their courses. Another 49.6 percent agreed. Slightly less than one-fourth (24.4 percent) were neutral, and 1 (0.8 percent) each chose the disagree and strongly disagree options. The calculated chi-square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed that graphic art helped them succeed in their courses. Another 1 (20.0 percent) agreed. None were neutral, none
disagreed, and 1 (20.0 percent) strongly disagreed with the statement. The calculated chi-square value is not significant.

Of the Hispanic respondents, none strongly agreed and 9 (81.8 percent) agreed that graphic art helped them succeed in their courses. 1 (9.1 percent) was neutral and 1 (9.1 percent) disagreed with the statement. None strongly disagreed. The calculated chi-square value is significant.

Only the chi-square tests for the Caucasian and Hispanic groups are significant.

This indicates that for these two groups the observed distribution of responses in Table 77 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 78. Responses by number of courses completed to Question 12: Graphic art helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>=&gt;5</td>
<td>49</td>
<td>11 (22.4%)</td>
<td>26 (53.1%)</td>
<td>11 (22.4%)</td>
<td>0 (0.0%)</td>
<td>1 (2.0%)</td>
<td>26.020*; df=3</td>
</tr>
<tr>
<td>1-4</td>
<td>57</td>
<td>16 (28.1%)</td>
<td>28 (49.1%)</td>
<td>10 (17.5%)</td>
<td>2 (3.5%)</td>
<td>1 (1.8%)</td>
<td>43.439*; df=4</td>
</tr>
<tr>
<td>1st Course</td>
<td>44</td>
<td>8 (18.2%)</td>
<td>23 (52.3%)</td>
<td>12 (27.3%)</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>23.091*; df=3</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed at least 5 courses to date, 22.4 percent strongly agreed that graphic art helped them succeed in their courses.

Another 53.1 percent agreed with the statement. 22.4 percent were neutral, none disagreed, and 1 respondent (2.0 percent) strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, more than one-fourth (28.1 percent) strongly agreed that graphic art helped them succeed in their courses. Another 49.1 percent agreed. 17.5 percent were neutral, 2 (3.5
percent) disagreed, and 1 (1.8 percent) strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in their first course, 18.2 percent strongly agreed that graphic art helped them succeed in their course. Another 52.3 percent agreed. 27.3 percent were neutral and 1 (2.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

All three chi-square tests are significant. This indicates that for these groups the observed distribution of responses in Table 78 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 79. Responses by recency of study to Question 12: Graphic art helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently Studying</td>
<td>128</td>
<td>28 (21.9%)</td>
<td>69 (53.9%)</td>
<td>28 (21.9%)</td>
<td>3 (2.3%)</td>
<td>0 (0.0%)</td>
<td>70.063*</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>19</td>
<td>5 (26.3%)</td>
<td>7 (36.8%)</td>
<td>5 (26.3%)</td>
<td>0 (0.0%)</td>
<td>2 (10.5%)</td>
<td>2.684NS</td>
</tr>
</tbody>
</table>

Of the respondents in the group which was currently studying at least one course, 21.9 percent strongly agreed that graphic art helped them succeed in their courses. Another 53.9 percent agreed. 21.9 percent were neutral and 3 respondents (2.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past year, slightly more than one-fourth (26.3 percent) strongly agreed that graphic art helped them succeed in their courses. Another 36.8 percent agreed. 26.3
percent were neutral, none disagreed, and 2 respondents (10.5 percent) strongly disagreed. The calculated chi-square value is not significant.

Only the chi-square test for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in Table 79 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Question 23 was a parallel to Question 12 (“Graphic art helped me succeed in the courses”). Whereas Question 12 responses were located on a Likert scale, Question 23 was part of a rank-order set in which the respondents ranked each of the eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus respondents were asked to rank the differences in type between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 23 appear in Tables 80 – 85.

Table 80. Responses to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>3.5</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>3.5</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>4.2</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>4.2</td>
</tr>
<tr>
<td>7</td>
<td>18</td>
<td>12.5</td>
</tr>
<tr>
<td>8</td>
<td>15</td>
<td>10.4</td>
</tr>
<tr>
<td>9</td>
<td>32</td>
<td>22.2</td>
</tr>
<tr>
<td>10</td>
<td>34</td>
<td>23.6</td>
</tr>
<tr>
<td>11</td>
<td>13</td>
<td>9.0</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 91.889*; df=10
In the chi-square goodness-of-fit test reported in Table 80, a theoretical
distribution of expected frequencies of 13.1 per response category was used for
comparison purposes. With 10 degrees of freedom, a critical chi-square value of 18.307
was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the
144 respondents to Question 23, 1.4 percent ranked graphic art number 1 (most helpful),
3.5 percent ranked it number 2, 3.5 percent ranked it number 3, 4.2 percent ranked it
number 4, 5.6 percent ranked it number 5, 4.2 percent ranked it number 6, 12.5 percent
ranked it number 7, 10.4 percent ranked it number 8, 22.2 percent ranked it number 9,
23.6 percent ranked it number 10, and 9 percent ranked it number 11 (least helpful). The
calculated chi-square value of 91.889 shows that the observed distribution of responses in
Table 80 departs significantly from the distribution of responses expected under the
condition of the hypothesis of no differences in the numbers of responses per response
category.

Table 81. Responses by gender to Question 23: Rank graphic art from 1 to 11 in order of
helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>2</td>
<td>3 (3.1%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>3</td>
<td>5 (5.2%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>3 (3.1%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>5</td>
<td>5 (5.2%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>6</td>
<td>2 (2.1%)</td>
<td>4 (8.3%)</td>
</tr>
<tr>
<td>7</td>
<td>12 (12.5%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>8</td>
<td>11 (11.5%)</td>
<td>4 (8.3%)</td>
</tr>
<tr>
<td>9</td>
<td>19 (19.8%)</td>
<td>13 (27.1%)</td>
</tr>
<tr>
<td>10</td>
<td>26 (27.1%)</td>
<td>8 (16.7%)</td>
</tr>
<tr>
<td>11</td>
<td>10 (10.4%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>48</td>
</tr>
</tbody>
</table>

$\chi^2 = 57.542^*; \ df=9$  $\chi^2 = 22.000^*; \ df=9$
Of the male respondents, none ranked graphic art number 1 (most helpful), 3.1 percent ranked it number 2, 5.2 percent ranked it number 3, 3.1 percent ranked it number 4, 5.2 percent ranked it number 5, 2.1 percent ranked it number 6, 12.5 percent ranked it number 7, 11.5 percent ranked it number 8, 19.8 percent ranked it number 9, 27.1 percent ranked it number 10, and 10.4 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the female respondents, 4.2 percent ranked graphic art number 1, 4.2 percent ranked it number 2, none ranked it number 3, 6.3 percent ranked it number 4, 6.3 percent ranked it number 5, 8.3 percent ranked it number 6, 12.5 percent ranked it number 7, 8.3 percent ranked it number 8, 27.1 percent ranked it number 9, 16.7 percent ranked it number 10, and 6.3 percent ranked it number 11. The calculated chi-square value is significant.

Both chi-square tests are significant. This indicates that for both gender groups the observed distribution of responses in Table 81 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 82. Responses by age to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1 (2.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>2</td>
<td>3 (6.8%)</td>
<td>1 (2.2%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (2.3%)</td>
<td>1 (2.2%)</td>
<td>3 (7.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>3 (6.8%)</td>
<td>2 (4.3%)</td>
<td>1 (2.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 (0.0%)</td>
<td>4 (8.7%)</td>
<td>2 (5.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>6</td>
<td>2 (4.5%)</td>
<td>1 (2.2%)</td>
<td>3 (7.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>7</td>
<td>7 (15.9%)</td>
<td>7 (15.2%)</td>
<td>2 (5.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>8</td>
<td>5 (11.4%)</td>
<td>5 (10.9%)</td>
<td>4 (10.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>9</td>
<td>8 (18.2%)</td>
<td>14 (30.4%)</td>
<td>6 (15.0%)</td>
<td>4 (28.6%)</td>
</tr>
<tr>
<td>10</td>
<td>14 (31.8%)</td>
<td>7 (15.2%)</td>
<td>10 (25.0%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (2.3%)</td>
<td>4 (8.7%)</td>
<td>7 (17.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>46</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

χ² = 29.227*; χ² = 31.826*; χ² = 23.250*; χ² = 4.000NS;
df = 8; df = 9; df = 10; df = 6

Of the respondents in the Under 30 age group, none ranked graphic art number 1 (most helpful), 6.8 percent ranked it number 2, 2.3 percent ranked it number 3, 6.8 percent ranked it number 4, none ranked it number 5, 4.5 percent ranked it number 6, 15.9 percent ranked it number 7, 11.4 percent ranked it number 8, 18.2 percent ranked it number 9, 31.8 percent ranked it number 10, and 2.3 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, none ranked graphic art number 1, 2.2 percent ranked it number 2, 2.2 percent ranked it number 3, 4.3 percent ranked it number 4, 8.7 percent ranked it number 5, 2.2 percent ranked it number 6, 15.2 percent ranked it number 7, 10.9 percent ranked it number 8, 30.4 percent ranked it number 9, 15.2 percent ranked it number 10, and 8.7 percent ranked it number 11. The calculated chi-square value is significant.
Of the respondents in the 40-49 age group, 2.5 percent ranked graphic art number 1, 2.5 percent ranked it number 2, 7.5 percent ranked it number 3, 2.5 percent ranked it number 4, 5.0 percent ranked it number 5, 7.5 percent ranked it number 6, 5.0 percent ranked it number 7, 10.0 percent ranked it number 8, 15.0 percent ranked it number 9, one-fourth ranked it number 10, and 17.5 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, 7.1 percent ranked graphic art number 1, none ranked it numbers 2, 3, or 4, 14.3 percent ranked it number 5, none ranked it number 6, 14.3 percent ranked it number 7, 7.1 percent ranked it number 8, 28.6 percent ranked it number 9, 21.4 percent ranked it number 10, and 7.1 percent ranked it number 11. The calculated chi-square value is not significant.

The chi-square tests for all groups except the 50 or Over group are significant. This indicates that for these groups the observed distribution of responses in Table 82 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 83. Responses by ethnic background to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 ( 0.0%)</td>
<td>2 ( 1.6%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 ( 0.0%)</td>
<td>5 ( 4.1%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>0 ( 0.0%)</td>
<td>4 ( 3.3%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 ( 0.0%)</td>
<td>6 ( 4.9%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 ( 0.0%)</td>
<td>6 ( 4.9%)</td>
<td>0 ( 0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>6</td>
<td>1 (20.0%)</td>
<td>5 ( 4.1%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>7</td>
<td>0 ( 0.0%)</td>
<td>17 (13.9%)</td>
<td>1 ( 33.3%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (20.0%)</td>
<td>11 ( 9.0%)</td>
<td>0 ( 0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>9</td>
<td>1 (20.0%)</td>
<td>28 (23.0%)</td>
<td>0 ( 0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (20.0%)</td>
<td>29 (23.8%)</td>
<td>0 ( 0.0%)</td>
<td>3 (30.0%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (20.0%)</td>
<td>9 ( 7.4%)</td>
<td>2 ( 66.7%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>122</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

χ²=0.000NS;df=4  χ²=81.590*;df=10  χ²=0.333NS;df=1  χ²=1.000NS;df=4

Of the American Indian respondents, none ranked graphic art higher than number 6. 1 (20.0 percent) ranked it number 6, 1 (20.0 percent) ranked it number 8, 1 (20.0 percent) ranked it number 9, 1 (20.0 percent) ranked it number 10, and 1 (20.0 percent) ranked it number 11 (least helpful). The calculated chi-square value is not significant.

Of the Caucasian respondents, 1.6 percent ranked graphic art number 1 (most helpful), 4.1 percent ranked it number 2, 3.3 percent ranked it number 3, 4.9 percent ranked it number 4, 4.9 percent ranked it number 5, 4.1 percent ranked it number 6, 13.9 percent ranked it number 7, 9 percent ranked it number 8, 23 percent ranked it number 9, nearly one-fourth (23.8 percent) ranked it number 10, and 7.4 percent ranked it number 11. The calculated chi-square value is significant.

Of the Black respondents, none ranked graphic art higher than number 7. 1 (33.3 percent) ranked it number 7, and 2 (66.7 percent) ranked it number 11. The calculated chi-square value is not significant.
Of the Hispanic respondents, none ranked graphic art higher than number 5. 2 (20.0 percent) ranked it number 5, 2 (20.0 percent) ranked it number 8, 2 (20.0 percent) ranked it number 9, 3 (30.0 percent) ranked it number 10, and 1 (10.0 percent) ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 83 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 84. Responses by number of courses completed to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 ( 2.2%)</td>
<td>0 ( 0.0%)</td>
<td>1 ( 2.4%)</td>
</tr>
<tr>
<td>2</td>
<td>2 ( 4.3%)</td>
<td>0 ( 0.0%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>3</td>
<td>3 ( 6.5%)</td>
<td>2 ( 3.6%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>4</td>
<td>1 ( 2.2%)</td>
<td>1 ( 1.8%)</td>
<td>4 ( 9.5%)</td>
</tr>
<tr>
<td>5</td>
<td>1 ( 2.2%)</td>
<td>4 ( 7.1%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>6</td>
<td>1 ( 2.2%)</td>
<td>4 ( 7.1%)</td>
<td>1 ( 2.4%)</td>
</tr>
<tr>
<td>7</td>
<td>5 (10.9%)</td>
<td>9 (16.1%)</td>
<td>4 ( 9.5%)</td>
</tr>
<tr>
<td>8</td>
<td>5 (10.9%)</td>
<td>7 (12.5%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>9</td>
<td>7 (15.2%)</td>
<td>13 (23.2%)</td>
<td>12 (28.6%)</td>
</tr>
<tr>
<td>10</td>
<td>14 (30.4%)</td>
<td>11 (19.6%)</td>
<td>9 (21.4%)</td>
</tr>
<tr>
<td>11</td>
<td>6 (13.0%)</td>
<td>5 ( 8.9%)</td>
<td>2 ( 4.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>56</td>
<td>42</td>
</tr>
</tbody>
</table>

$\chi^2=37.217^*; \text{df}=10$  $\chi^2=21.464^*; \text{df}=8$  $\chi^2=27.048^*; \text{df}=9$

Of the respondents in the group which had completed at least five courses to date, 2.2 percent ranked graphic art number 1 (most helpful), 4.3 percent ranked it number 2, 6.5 percent ranked it number 3, 2.2 percent ranked it number 4, 2.2 percent ranked it number 5, 2.2 percent ranked it number 6, 10.9 percent ranked it number 7, 10.9 percent ranked it number 8, 15.2 percent ranked it number 9, nearly one-third (30.4 percent)
ranked it number 10, and 13.0 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, none ranked graphic art number 1 or 2, 3.6 percent ranked it number 3, 1.8 percent ranked it number 4, 7.1 percent ranked it number 5, 7.1 percent ranked it number 6, 16.1 percent ranked it number 7, 12.5 percent ranked it number 8, 23.2 percent ranked it number 9, 19.6 percent ranked it number 10, and 8.9 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in their first course, 2.4 percent ranked graphic art number 1, 7.1 percent ranked it number 2, none ranked it number 3, 9.5 percent ranked it number 4, 7.1 percent ranked it number 5, 2.1 percent ranked it number 6, 9.5 percent ranked it number 7, 7.1 percent ranked it number 8, 28.6 percent ranked it number 9, 21.4 percent ranked it number 10, and 4.8 percent ranked it number 11. The calculated chi-square value is significant.

The chi-square tests for all three groups are significant. This indicates that for all three groups the observed distribution of responses in Table 84 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 85. Responses by recency of study to Question 23: Rank graphic art from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 ( 0.8%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>2</td>
<td>5 ( 4.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>3 ( 2.4%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>4</td>
<td>6 ( 4.8%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>8 ( 6.5%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>5 ( 4.0%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>7</td>
<td>17 (13.7%)</td>
<td>1 ( 5.3%)</td>
</tr>
<tr>
<td>8</td>
<td>13 (10.5%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>9</td>
<td>28 (22.6%)</td>
<td>4 (21.1%)</td>
</tr>
<tr>
<td>10</td>
<td>29 (23.4%)</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>11</td>
<td>9 ( 7.3%)</td>
<td>4 (21.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>19</td>
</tr>
</tbody>
</table>

$\chi^2=82.161^*; \ df=10$ $\chi^2=8.368\text{NS}; df=7$

Of the respondents in the group which was currently studying at least one course, 0.8 percent ranked graphic art number 1 (most helpful), 4.0 percent ranked it number 2, 2.4 percent ranked it number 3, 4.8 percent ranked it number 4, 6.5 percent ranked it number 5, 4 percent ranked it number 6, 13.7 percent ranked it number 7, 10.5 percent ranked it number 8, nearly one-fourth (22.6 percent) ranked it number 9, nearly one-fourth (23.4 percent) ranked it number 10, and 7.3 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied in the past 12 months, 5.3 percent ranked graphic art number 1, none ranked it number 2, 5.3 percent ranked it number 3, none ranked it numbers 4 or 5, 5.3 percent ranked it number 6, 5.3 percent ranked it number 7, 10.5 percent ranked it number 8, 21.1 percent ranked it number 9, over one-fourth (26.3 percent) ranked it number 10, and 21.1 percent ranked it number 11. The calculated chi-square value is not significant.
Only the chi-square test for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in Table 85 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section 9: Study Question Data

For Question 13, respondents were to locate on a Likert scale their perception of the helpfulness of study questions in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 86 – 91.

Table 86. Responses to Question 13: The Study Questions in each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>72</td>
<td>47.7</td>
</tr>
<tr>
<td>Agree</td>
<td>70</td>
<td>46.4</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Disagree</td>
<td>4</td>
<td>2.6</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Total</td>
<td>151</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 184.000^*; \text{ df} = 4 \]

In the chi-square goodness-of-fit test reported in Table 86, a theoretical distribution of expected frequency of 30.2 per response category was used for comparison purposes. With 4 degrees of freedom, a critical chi-square value of 9.488 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 151 respondents to Question 13, slightly less than one-half (47.4 percent) strongly agreed that study questions helped them succeed in their courses while an additional 46.1 percent agreed with the statement. 4 respondents (2.6 percent) were neutral, 4 (2.6 percent)
disagreed, and 1 (0.7 percent) strongly disagreed. The observed chi-square value of 184.000 shows that the observed distribution of responses in Table 86 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 87. Responses by gender to Question 13: The Study Questions in each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>101</td>
<td>43 (42.6%)</td>
<td>51 (50.5%)</td>
<td>3 (3.0%)</td>
<td>4 (4.0%)</td>
<td>0 (0.0%)</td>
<td>76.228*; df=3</td>
</tr>
<tr>
<td>Female 51</td>
<td>29 (58.0%)</td>
<td>19 (38.0%)</td>
<td>1 (2.0%)</td>
<td>0 (0.0%)</td>
<td>1 (2.0%)</td>
<td>46.320*; df=3</td>
<td></td>
</tr>
</tbody>
</table>

Of the male respondents, 42.6 percent strongly agreed that study questions helped them succeed in their courses. Another 50.5 percent agreed. 3.0 percent were neutral and 4.0 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, more than one-half (58.0 percent) strongly agreed that study questions helped them succeed in their courses. Another 38.0 percent agreed. 1 (2.0 percent) was neutral, none disagreed, and 1 (2.0 percent) strongly disagreed. The calculated chi-square value is significant.

Both chi-square tests are significant. This indicates that the observed distribution of responses in Table 87 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 88. Responses by age to Question 13: The Study Questions in each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
<th>df=1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>23 (51.1%)</td>
<td>22 (48.9%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.022NS;</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>50</td>
<td>27 (54.0%)</td>
<td>18 (36.0%)</td>
<td>2 (4.0%)</td>
<td>2 (4.0%)</td>
<td>1 (2.0%)</td>
<td>56.200*;</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>42</td>
<td>15 (35.7%)</td>
<td>24 (57.1%)</td>
<td>2 (4.8%)</td>
<td>1 (2.4%)</td>
<td>0 (0.0%)</td>
<td>34.762*;</td>
<td></td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>7 (50.0%)</td>
<td>6 (42.9%)</td>
<td>0 (0.0%)</td>
<td>1 (7.1%)</td>
<td>0 (0.0%)</td>
<td>4.429NS;</td>
<td></td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 age group, slightly more than one-half (51.1 percent) strongly agreed that study questions helped them succeed in their courses. Another 48.9 percent agreed. None were neutral and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the respondents in the 30-39 age group, more than one-half (54.0 percent) strongly agreed that study questions helped them succeed in their courses. Another 36.0 percent agreed. 2 (4.0 percent) were neutral, 2 (4.0 percent) disagreed, and 1 (2.0 percent) strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 35.7 percent strongly agreed that study questions helped them succeed in their courses. Another 57.1 percent agreed. 2 (4.8 percent) were neutral and 1 (2.4 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 50 or Over group, one-half strongly agreed that study questions helped them succeed in their courses. Another 42.9 percent agreed. None were neutral and 1 (7.1 percent) disagreed. None strongly disagreed. The calculated chi-square value is not significant.
Only the chi-square tests for the 30-39 and the 40-49 groups are significant. This indicates that for these two groups the observed distribution of responses in Table 88 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 89. Responses by ethnic background to Question 13: The Study Questions in each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr'd</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>2 (33.3%)</td>
<td>4 (66.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.667NS; df=1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>123</td>
<td>60 (48.8%)</td>
<td>56 (45.5%)</td>
<td>4 (3.3%)</td>
<td>2 (1.6%)</td>
<td>1 (0.8%)</td>
<td>151.675*; df=4</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>0.449NS; df=2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>4 (33.3%)</td>
<td>7 (58.3%)</td>
<td>0 (0.0%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>4.500NS; df=2</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, one-third (33.3 percent) strongly agreed that study questions helped them succeed while two-thirds (66.7 percent) agreed with the statement. None were neutral and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, slightly less than one-half (48.8 percent) strongly agreed that study questions helped them succeed in their courses. Another 45.5 percent agreed with the statement. 3.3 percent were neutral, 1.6 percent disagreed, and 1 respondent (0.8 percent) strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed and 1 (20.0 percent) agreed that study questions helped them succeed in their courses. None were neutral and
Of the Hispanic respondents, one-third (33.3 percent) strongly agreed and more than one-half (58.3 percent) agreed that study questions helped them succeed in their courses. None were neutral and 1 (8.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is not significant.

Of the respondents in the group which had completed at least 5 courses to date, slightly more than one-half (51.0 percent) strongly agreed that study questions helped them succeed in their courses. Another 42.9 percent agreed. 1 (2.0 percent) was neutral, 1 (2.0 percent) disagreed, and 1 (2.0 percent) strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, slightly less than one-half (49.2 percent) strongly agreed that study questions helped them succeed in their courses. Another 42.4 percent agreed. 3.4 percent were neutral and
5.1 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in their first course, 41.9 percent strongly agreed that study questions helped them succeed in their course. Another 55.8 percent agreed. 1 (2.3 percent) was neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

All three chi-square tests are significant. This indicates that the observed distribution of responses in Table 90 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Of the respondents in the group which was currently studying at least one course, slightly less than one-half (48.8 percent) strongly agreed that study questions helped them succeed in their courses. Another 45.7 percent agreed. 3 (2.4 percent) were neutral, 3 (2.4 percent) disagreed, and 1 (0.8 percent) strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, 38.1 percent strongly agreed that study questions helped them succeed in their courses. Another 52.4 percent agreed. 1 (4.8 percent) was neutral and 1
(4.8 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Both chi-square tests are significant. This indicates that the observed distribution of responses in Table 91 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Question 24 was a parallel to Question 13 ("The Study Questions in each lesson helped me succeed in the courses"). Whereas Question 13 responses were located on a Likert scale, Question 24 was part of a rank-order set in which the respondents ranked each of the eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus respondents were asked to rank Study Questions between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 24 appear in Tables 92 – 97.

Table 92. Responses to Question 24: Rank Study Questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>33</td>
<td>22.8</td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>19.3</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>17.2</td>
</tr>
<tr>
<td>4</td>
<td>28</td>
<td>19.3</td>
</tr>
<tr>
<td>5</td>
<td>13</td>
<td>9.0</td>
</tr>
<tr>
<td>6</td>
<td>11</td>
<td>7.6</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>Total</td>
<td>145</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 77.766^*; \text{ df } = 8 \]
In the chi-square goodness-of-fit test reported in Table 92, a theoretical distribution of expected frequencies of 16.1 per response category was used for comparison purposes. With 8 degrees of freedom, a critical chi-square value of 15.507 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 145 respondents to Question 24, 22.8 percent ranked study questions number 1 (most helpful), 19.3 percent ranked it number 2, 17.2 percent ranked it number 3, 19.3 percent ranked it number 4, 9 percent ranked it number 5, 7.6 percent ranked it number 6, 1.4 percent ranked it number 7, 1.4 percent ranked it number 8, none ranked it number 9 or 10, and 2.1 percent ranked it number 11 (least helpful). The calculated chi-square value of 77.766 shows that the observed distribution of responses in Table 92 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 93. Responses by gender to Question 24: Rank Study Questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22 (22.9%)</td>
<td>11 (22.4%)</td>
</tr>
<tr>
<td>2</td>
<td>14 (14.6%)</td>
<td>14 (28.6%)</td>
</tr>
<tr>
<td>3</td>
<td>17 (17.7%)</td>
<td>8 (16.3%)</td>
</tr>
<tr>
<td>4</td>
<td>20 (20.8%)</td>
<td>8 (16.3%)</td>
</tr>
<tr>
<td>5</td>
<td>7 ( 7.3%)</td>
<td>6 (12.2%)</td>
</tr>
<tr>
<td>6</td>
<td>9 ( 9.4%)</td>
<td>2 ( 4.1%)</td>
</tr>
<tr>
<td>7</td>
<td>2 ( 2.1%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>2 ( 2.1%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>3 ( 3.1%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>49</td>
</tr>
</tbody>
</table>

χ² = 46.125*; df = 8  χ² = 10.388NS; df = 5

Of the male respondents, slightly less than one-fourth (22.9 percent) ranked study questions number 1 (most helpful), 14.6 percent ranked it number 2, 17.7 percent ranked
it number 3, 20.8 percent ranked it number 4, 7.3 percent ranked it number 5, 9.4 percent
ranked it number 6, 2.1 percent ranked it number 7, 2.1 percent ranked it number 8, none
ranked it either 9 or 10, and 3.1 percent ranked it number 11 (least helpful). The
calculated chi-square value is significant.

Of the female respondents, nearly one-fourth (22.4 percent) ranked study
questions number 1, more than one-fourth (28.6 percent) ranked it number 2, 16.3 percent
ranked it number 3, 16.3 percent ranked it number 4, 12.2 percent ranked it number 5,
and 4.1 percent ranked it number 6. None ranked it any lower than number 6. The
calculated chi-square value is not significant.

Only the chi-square test for males is significant. This indicates that for males the
observed distribution of responses in Table 93 departs significantly from the distribution
of responses expected under the condition of the hypothesis of no differences in the
numbers of responses per response category.

Table 94. Responses by age to Question 24: Rank Study Questions in each lesson from 1
to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 (27.3%)</td>
<td>11 (23.9%)</td>
<td>7 (17.1%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>2</td>
<td>6 (13.6%)</td>
<td>12 (26.1%)</td>
<td>6 (14.6%)</td>
<td>4 (28.6%)</td>
</tr>
<tr>
<td>3</td>
<td>8 (18.2%)</td>
<td>8 (17.4%)</td>
<td>6 (14.6%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>4</td>
<td>9 (20.5%)</td>
<td>6 (13.0%)</td>
<td>10 (24.4%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>5</td>
<td>5 (11.4%)</td>
<td>3 (6.5%)</td>
<td>5 (12.2%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>2 (4.5%)</td>
<td>3 (6.5%)</td>
<td>5 (12.2%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (2.3%)</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (2.3%)</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>1 (2.2%)</td>
<td>2 (4.9%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>46</td>
<td>41</td>
<td>14</td>
</tr>
</tbody>
</table>

$\chi^2=20.727^*; \ df=7 \quad \chi^2=29.522^*; \ df=8 \quad \chi^2=5.951\text{NS}; \ df=6 \quad \chi^2=1.714\text{NS}; \ df=4$
Of the respondents in the Under 30 age group, more than one-fourth (27.3 percent) ranked study questions number 1 (most helpful), 13.6 percent ranked it number 2, 18.2 percent ranked it number 3, 20.5 percent ranked it number 4, 11.4 percent ranked it number 5, 4.5 percent ranked it number 6, 2.3 percent ranked it number 7, and 2.3 percent ranked it number 8. None ranked it lower than number 8. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, slightly less than one-fourth (23.9 percent) ranked study questions number 1, slightly more than one-fourth (26.1 percent) ranked it number 2, 17.4 percent ranked it number 3, 13.0 percent ranked it number 4, 6.5 percent ranked it number 5, 6.5 percent ranked it number 6, 2.2 percent ranked it number 7, 2.2 percent ranked it number 8, none ranked it either number 9 or 10, and 2.2 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 17.1 percent ranked study questions number 1, 14.6 percent ranked it number 2, 14.6 percent ranked it number 3, nearly one-fourth (24.4 percent) ranked it number 4, 12.2 percent ranked it number 5, 12.2 percent ranked it number 6, none ranked it numbers 7, 8, 9, or 10, and 4.9 percent ranked it number 11. The calculated chi-square value is not significant.

Of the respondents in the 50 or Over age group, 21.4 percent ranked study questions number 1, over one-fourth (28.6 percent) ranked it number 2, 21.4 percent ranked it number 3, 21.4 percent ranked it number 4, none ranked it number 5, and 7.1 percent ranked it number 6. None ranked the item lower than number 6. The calculated chi-square value is not significant.
Only the chi-square tests for the Under 30 and the 30-39 groups are significant. This indicates that for these two groups the observed distribution of responses in Table 94 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 95. Responses by ethnic background to Question 24: Rank Study Questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 (20.0%)</td>
<td>30 (24.4%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 (0.0%)</td>
<td>26 (21.1%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (20.0%)</td>
<td>21 (17.1%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>4</td>
<td>2 (40.0%)</td>
<td>20 (16.3%)</td>
<td>2 (66.7%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>5</td>
<td>1 (20.0%)</td>
<td>11 (8.9%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>6</td>
<td>0 (0.0%)</td>
<td>9 (7.3%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>7</td>
<td>0 (0.0%)</td>
<td>2 (1.6%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>0 (0.0%)</td>
<td>1 (0.8%)</td>
<td>1 (33.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>3 (2.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>123</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

\[ \chi^2=0.600\text{NS; df=3} \quad \chi^2=69.659*; df=8 \quad \chi^2=0.333\text{NS; df=1} \quad \chi^2=0.800\text{NS; df=5} \]

Of the American Indian respondents, 1 (20.0 percent) ranked study questions number 1 (most helpful), 1 (20.0 percent) ranked it number 3, 2 (40.0 percent) ranked it number 4, and 1 (20.0 percent) ranked it number 5. None ranked the item lower than number 5. The calculated chi-square value is not significant.

Of the Caucasian respondents, nearly one-fourth (24.4 percent) ranked study questions number 1, 21.1 percent ranked it number 2, 17.1 percent ranked it number 3, 16.3 percent ranked it number 4, 8.9 percent ranked it number 5, 7.3 percent ranked it number 6, 1.6 percent ranked it number 7, 0.8 percent ranked it number 8, none ranked it numbers 9 or 10, and 2.4 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.
Of the Black 3 respondents, 2 (66.7 percent) ranked study questions number 4 and 1 (33.3 percent) ranked it number 8. None ranked it higher than 4 or lower than 8. The calculated chi-square value is not significant.

Of the Hispanic respondents, 2 (20.0 percent) ranked study questions number 1, 2 (20.0 percent) ranked it number 2, 2 (20.0 percent) ranked it number 3, 2 (20.0 percent) ranked it number 4, 1 (10.0 percent) ranked it number 5, and 1 (10.0 percent) ranked it number 6. None ranked the item lower than number 6. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 95 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 96. Responses by number of courses completed to Question 24: Rank Study Questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9 (19.6%)</td>
<td>15 (26.3%)</td>
<td>9 (21.4%)</td>
</tr>
<tr>
<td>2</td>
<td>9 (19.6%)</td>
<td>13 (22.8%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>3</td>
<td>10 (21.7%)</td>
<td>9 (15.8%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>4</td>
<td>8 (17.4%)</td>
<td>12 (21.1%)</td>
<td>8 (19.0%)</td>
</tr>
<tr>
<td>5</td>
<td>3 (6.5%)</td>
<td>3 (5.3%)</td>
<td>7 (16.7%)</td>
</tr>
<tr>
<td>6</td>
<td>4 (8.7%)</td>
<td>2 (3.5%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (2.2%)</td>
<td>1 (1.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (2.2%)</td>
<td>1 (1.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (2.2%)</td>
<td>1 (1.8%)</td>
<td>1 (2.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>57</td>
<td>42</td>
</tr>
</tbody>
</table>

$\chi^2$=23.261*; df=8  $\chi^2$=43.263*; df=8  $\chi^2$=6.667NS; df=6
Of the respondents in the group which had completed 5 or more course to date, 19.6 percent ranked study questions number 1 (most helpful), 19.6 percent ranked it number 2, 21.7 percent ranked it number 3, 17.4 percent ranked it number 4, 6.5 percent ranked it number 5, 8.7 percent ranked it number 6, 2.2 percent ranked it number 7, 2.2 percent ranked it number 8, none ranked it numbers 9 or 10, and 2.2 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, over one-fourth (26.3 percent) ranked study questions number 1, slightly under one-fourth (22.8 percent) ranked it number 2, 15.8 percent ranked it number 3, 21.1 percent ranked it number 4, 5.3 percent ranked it number 5, 3.5 percent ranked it number 6, 1.8 percent ranked it number 7, 1.8 percent ranked it number 8, none ranked it numbers 9 or 10, and 1.8 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in its first course, 21.4 percent ranked study questions number 1, 14.3 percent ranked it number 2, 14.3 percent ranked it number 3, 19.0 percent ranked it number 4, 16.7 percent ranked it number 5, 11.9 percent ranked it number 6, none ranked it numbers 7, 8, 9, or 10, and 2.4 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square tests for the 5 or More and the 1-4 groups are significant. This indicates that for these groups the observed distribution of responses in Table 96 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 97. Responses by recency of study to Question 24: Rank Study Questions in each lesson from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27 (21.8%)</td>
<td>6 (30.0%)</td>
</tr>
<tr>
<td>2</td>
<td>24 (19.4%)</td>
<td>4 (20.0%)</td>
</tr>
<tr>
<td>3</td>
<td>24 (19.4%)</td>
<td>1 ( 5.0%)</td>
</tr>
<tr>
<td>4</td>
<td>21 (16.9%)</td>
<td>7 (35.0%)</td>
</tr>
<tr>
<td>5</td>
<td>12 ( 9.7%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>11 ( 8.9%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>7</td>
<td>1 ( 0.8%)</td>
<td>1 ( 5.0%)</td>
</tr>
<tr>
<td>8</td>
<td>1 ( 0.8%)</td>
<td>1 ( 5.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>3 ( 2.4%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>20</td>
</tr>
</tbody>
</table>

$\chi^2=64.565^*; \ df=8 \quad \chi^2=11.200^*; \ df=5$

Of the respondents in the group which was currently studying at least one course, 21.8 percent ranked study questions number 1 (most helpful), 19.4 percent ranked it number 2, 19.4 percent ranked it number 3, 16.9 percent ranked it number 4, 9.7 percent ranked it number 5, 8.9 percent ranked it number 6, 0.8 percent ranked it number 7, 0.8 percent ranked it number 8, none ranked it numbers 9 or 10, and 2.4 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group that was not currently studying but had studied within the past 12 months, 30.0 percent ranked study questions number 1, 20.0 percent ranked it number 2, 5.0 percent ranked it number 3, over one-third (35.0 percent) ranked it number 4, none ranked it numbers 5 or 6, 5.0 percent ranked it number 7, and 5.0 percent ranked it number 8. None ranked it lower than number 8. The calculated chi-square value is significant.

The chi-square tests for both groups are significant. This indicates that for these groups the observed distribution of responses in Table 97 departs significantly from the
distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section 10: Answers to Study Question Data

For Question 14, respondents were to locate on a Likert scale their perception of the helpfulness of the answers to study questions in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 98 – 103.

Table 98. Responses to Question 14: The Answers to the Study Questions at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>78</td>
<td>52.0</td>
</tr>
<tr>
<td>Agree</td>
<td>61</td>
<td>40.7</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>7</td>
<td>4.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>4</td>
<td>2.7</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>150</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\( \chi^2 = 113.200^*; \ df = 3 \)

In the chi-square goodness-of-fit test reported in Table 98, a theoretical distribution of expected frequency of 37.5 per response category was used for comparison purposes. With 3 degrees of freedom, a critical chi-square value of 7.815 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 150 respondents to Question 14, more than half (52.0 percent) strongly agreed that the answers to study questions helped them succeed in their courses, while 40.7 percent agreed with the statement. In addition, 4.7 percent were neutral, 2.7 percent disagreed with the statement, and none strongly disagreed. The observed chi-square value of
113.200 shows that the observed distribution of responses in Table 98 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 99. Responses by gender to Question 14: The Answers to the Study Questions at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>101</td>
<td>50 (49.4%)</td>
<td>45 (44.6%)</td>
<td>3 (3.0%)</td>
<td>3 (3.0%)</td>
<td>0 (0.0%)</td>
<td>78.921*; df=3</td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>28 (57.1%)</td>
<td>16 (32.7%)</td>
<td>4 (8.2%)</td>
<td>1 (2.0%)</td>
<td>0 (0.0%)</td>
<td>37.286*; df=3</td>
</tr>
</tbody>
</table>

Of the male respondents, almost one-half (49.4 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 44.6 percent agreed. 3.0 percent were neutral and 3.0 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, more than one-half (57.1 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 32.7 percent agreed. 4 respondents (8.2 percent) were neutral and 1 (2.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that for these groups the observed distribution of responses in Table 99 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 100. Responses by age to Question 14: The Answers to the Study Questions at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>25 (55.6%)</td>
<td>17 (37.8%)</td>
<td>3 (6.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>16.533*; df=2</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>50</td>
<td>27 (54.0%)</td>
<td>17 (34.0%)</td>
<td>3 (6.0%)</td>
<td>3 (6.0%)</td>
<td>0 (0.0%)</td>
<td>32.880*; df=3</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>41</td>
<td>23 (56.1%)</td>
<td>18 (43.9%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.610NS; df=1</td>
<td></td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>3 (21.4%)</td>
<td>9 (64.3%)</td>
<td>1 (7.1%)</td>
<td>1 (7.1%)</td>
<td>0 (0.0%)</td>
<td>12.286*; df=3</td>
<td></td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 age group, more than one-half (55.6 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 37.8 percent agreed. 3 (6.7 percent) were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, more than one-half (54.0 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 34.0 percent agreed. 3 (6.0 percent) were neutral and 3 (6.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, more than one-half (56.1 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 43.9 percent agreed. None were neutral, and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the respondents in the 50 or Over age group, 3 (21.4 percent) strongly agreed that answers to study questions helped them succeed in their courses and slightly less than two-thirds (64.3 percent) agreed. 1 (7.1 percent) was neutral and 1 (7.1 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for all age groups except the 40-49 group are significant. This indicates that for these groups the observed distribution of responses in Table 100 departs
significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 101. Responses by ethnic background to Question 14: The Answers to the Study Questions at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>2 (33.3%)</td>
<td>4 (66.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.667NS; df=1</td>
</tr>
<tr>
<td>Caucasian</td>
<td>122</td>
<td>63 (51.6%)</td>
<td>52 (42.6%)</td>
<td>5 (4.1%)</td>
<td>2 (1.6%)</td>
<td>0 (0.0%)</td>
<td>97.738*; df=3</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>1.600NS; df=2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>6 (50.0%)</td>
<td>3 (25.0%)</td>
<td>2 (16.7%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>4.667*; df=3</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, 2 (33.3 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 4 (66.7 percent) agreed. None were neutral, and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, more than one-half (51.6 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 42.6 percent agreed. 5 (4.1 percent) were neutral and 2 (1.6 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 1 (20.0 percent) agreed, and 1 (20.0 percent) disagreed. The calculated chi-square value is not significant.

Of the Hispanic respondents, one-half of the respondents strongly agreed that answers to study questions helped them succeed in their courses. Another one-fourth agreed with the statement. 2 (16.7 percent) were neutral and 1 (8.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.
Only the chi-square tests for the Caucasian and Hispanic groups are significant. This indicates that for these two groups the observed distribution of responses in Table 101 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 102. Responses by number of courses completed to Question 14: The Answers to the Study Questions at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>= 5</td>
<td>49</td>
<td>24 (49.0%)</td>
<td>20 (40.8%)</td>
<td>4 (8.2%)</td>
<td>1 (2.0%)</td>
<td>0 (0.0%)</td>
<td>32.061*; df=3</td>
</tr>
<tr>
<td>1-4</td>
<td>58</td>
<td>36 (62.1%)</td>
<td>17 (29.3%)</td>
<td>2 (3.4%)</td>
<td>3 (5.2%)</td>
<td>0 (0.0%)</td>
<td>52.207*; df=3</td>
</tr>
<tr>
<td>1st Course</td>
<td>43</td>
<td>18 (41.9%)</td>
<td>24 (55.8%)</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>19.860*; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed at least 5 courses to date, slightly less than one-half (49.0 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 40.8 percent agreed. 4 (8.2 percent) were neutral and 1 (2.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, slightly less than two-thirds (62.1 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 29.3 percent agreed. 2 (3.4 percent) were neutral and 3 (5.2 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in its first course, 41.9 percent strongly agreed that answers to study questions helped them succeed in their course. Another 55.8 percent agreed. 1 (2.3 percent) was neutral, and none chose either of the disagree options. The calculated chi-square value is significant.
The chi-square tests for all three groups are significant. This indicates that for these groups the observed distribution of responses in Table 102 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 103. Responses by recency of study to Question 14: The Answers to the Study Questions at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently</td>
<td>127</td>
<td>66 (52.0%)</td>
<td>53 (41.7%)</td>
<td>5 (3.9%)</td>
<td>3 (2.4%)</td>
<td>0 (0.0%)</td>
<td>99.740*; df=3</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>20</td>
<td>10 (50.0%)</td>
<td>7 (35.0%)</td>
<td>2 (10.0%)</td>
<td>1 (5.0%)</td>
<td>0 (0.0%)</td>
<td>10.800*; df=3</td>
</tr>
</tbody>
</table>

Of the respondents in the group which was currently studying at least one course, more than one-half (52.0 percent) strongly agreed that answers to study questions helped them succeed in their courses. Another 41.7 percent agreed. 5 (3.9 percent) were neutral and 3 (2.4 percent) disagreed. None strongly disagreed. The calculated chi-square value for this group is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, one-half strongly agreed that answers to study questions helped them succeed in their courses. Another 35.0 percent agreed. 2 (10.0 percent) were neutral and 1 (5.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Both chi-square tests are significant. This indicates that for these groups the observed distribution of responses in Table 103 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Question 25 was a parallel to Question 14 (“The Answers to Study Questions in each lesson helped me succeed in the courses”). Whereas Question 14 responses were located on a Likert scale, Question 25 was part of a rank-order set in which the respondents ranked each of the eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus respondents were asked to rank Answers to Study Questions between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 25 appear in Tables 104 – 109.

Table 104. Responses to Question 25: Rank the Answers to the Study Questions from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>2</td>
<td>26</td>
<td>18.1</td>
</tr>
<tr>
<td>3</td>
<td>26</td>
<td>18.1</td>
</tr>
<tr>
<td>4</td>
<td>29</td>
<td>20.1</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
<td>13.9</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>6.9</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>6.9</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
<td>8.3</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>Total</td>
<td>144</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 83.181^*; \text{ df} = 10 \]

In the chi-square goodness-of-fit test reported in Table 104, a theoretical distribution of expected frequencies of 13.1 per response category was used for comparison purposes. With 10 degrees of freedom, a critical chi-square value of 18.307 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 144 respondents to Question 25, 2.8 percent ranked answers to study questions number 1 (most helpful), 18.1 percent ranked it number 2, 18.1 percent ranked it number 3, 20.1
percent ranked it number 4, 13.9 percent ranked it number 5, 6.9 percent ranked it number 6, 6.9 percent ranked it number 7, 8.3 percent ranked it number 8, 2.8 percent ranked it number 9, 0.7 percent ranked it number 10, and 1.4 percent ranked it number 11 (least helpful). The calculated chi-square value of 83.181 shows that the observed distribution of responses in Table 104 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 105. Responses by gender to Question 25: Rank the Answers to the Study Questions from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 (4.2%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>19 (19.8%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>3</td>
<td>16 (16.7%)</td>
<td>10 (20.8%)</td>
</tr>
<tr>
<td>4</td>
<td>17 (17.7%)</td>
<td>12 (25.0%)</td>
</tr>
<tr>
<td>5</td>
<td>14 (14.6%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>6</td>
<td>7 (7.3%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>7</td>
<td>5 (5.2%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>8</td>
<td>9 (9.4%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>9</td>
<td>4 (4.2%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (1.0%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>48</td>
</tr>
</tbody>
</table>

\[ \chi^2=38.375^*; \text{ df}=9 \]

\[ \chi^2=22.125^*; \text{ df}=8 \]

Of the male respondents, 4.2 percent ranked answers to study questions number 1 (most helpful), 19.8 percent ranked it number 2, 16.7 percent ranked it number 3, 17.7 percent ranked it number 4, 14.6 percent ranked it number 5, 7.3 percent ranked it number 6, 5.2 percent ranked it number 7, 9.4 percent ranked it number 8, 4.2 percent ranked it number 9, none ranked it number 10, and 1 percent ranked it number 11 (least helpful). The calculated chi-square value for this group is significant.
Of the female respondents, none ranked answers to study question number 1, 14.6 percent ranked it number 2, 20.8 percent ranked it number 3, one-fourth ranked it number 4, 12.5 percent ranked it number 5, 6.3 percent ranked it number 6, 10.4 percent ranked it number 7, 6.3 percent ranked it number 8, none ranked it number 9, 2.1 percent ranked it number 10, and 2.1 percent ranked it number 11. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that for these two groups the observed distribution of responses in Table 105 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 106. Responses by age to Question 25: Rank the Answers to the Study Questions from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (4.5%)</td>
<td>0 (0.0%)</td>
<td>2 (5.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>11 (25.0%)</td>
<td>7 (15.2%)</td>
<td>7 (17.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>3</td>
<td>6 (13.6%)</td>
<td>13 (28.3%)</td>
<td>5 (12.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>4</td>
<td>9 (20.5%)</td>
<td>8 (17.4%)</td>
<td>8 (20.0%)</td>
<td>4 (28.6%)</td>
</tr>
<tr>
<td>5</td>
<td>5 (11.4%)</td>
<td>7 (15.2%)</td>
<td>6 (15.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>6</td>
<td>3 (6.8%)</td>
<td>2 (4.3%)</td>
<td>4 (10.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (2.3%)</td>
<td>3 (6.5%)</td>
<td>5 (12.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>8</td>
<td>4 (9.1%)</td>
<td>4 (8.7%)</td>
<td>2 (5.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>9</td>
<td>1 (2.3%)</td>
<td>1 (2.2%)</td>
<td>1 (2.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (2.3%)</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>46</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

\(\chi^2=30.000*;\)  \(\chi^2=24.826*;\)  \(\chi^2=10.400\text{NS};\)  \(\chi^2=4.286\text{NS};\)
\(\text{df}=10\)  \(\text{df}=8\)  \(\text{df}=8\)  \(\text{df}=7\)

Of the respondents in the Under 30 age group, 4.5 percent ranked answers to study questions number 1 (most helpful), 25.0 percent ranked it number 2, 13.6 percent ranked it number 3, 20.5 percent ranked it number 4, 11.4 percent ranked it number 5, 6.8 percent ranked it number 6, 12.5 percent ranked it number 7, 6.3 percent ranked it number 8, none ranked it number 9, 2.1 percent ranked it number 10, and 2.1 percent ranked it number 11. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that for these two groups the observed distribution of responses in Table 105 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 106. Responses by age to Question 25: Rank the Answers to the Study Questions from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (4.5%)</td>
<td>0 (0.0%)</td>
<td>2 (5.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>11 (25.0%)</td>
<td>7 (15.2%)</td>
<td>7 (17.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>3</td>
<td>6 (13.6%)</td>
<td>13 (28.3%)</td>
<td>5 (12.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>4</td>
<td>9 (20.5%)</td>
<td>8 (17.4%)</td>
<td>8 (20.0%)</td>
<td>4 (28.6%)</td>
</tr>
<tr>
<td>5</td>
<td>5 (11.4%)</td>
<td>7 (15.2%)</td>
<td>6 (15.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>6</td>
<td>3 (6.8%)</td>
<td>2 (4.3%)</td>
<td>4 (10.0%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (2.3%)</td>
<td>3 (6.5%)</td>
<td>5 (12.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>8</td>
<td>4 (9.1%)</td>
<td>4 (8.7%)</td>
<td>2 (5.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>9</td>
<td>1 (2.3%)</td>
<td>1 (2.2%)</td>
<td>1 (2.5%)</td>
<td>1 (7.1%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (2.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (2.3%)</td>
<td>1 (2.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>46</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

\(\chi^2=30.000*;\)  \(\chi^2=24.826*;\)  \(\chi^2=10.400\text{NS};\)  \(\chi^2=4.286\text{NS};\)
\(\text{df}=10\)  \(\text{df}=8\)  \(\text{df}=8\)  \(\text{df}=7\)

Of the respondents in the Under 30 age group, 4.5 percent ranked answers to study questions number 1 (most helpful), 25.0 percent ranked it number 2, 13.6 percent ranked it number 3, 20.5 percent ranked it number 4, 11.4 percent ranked it number 5, 6.8
percent ranked it number 6, 2.3 percent ranked it number 7, 9.1 percent ranked it number 8, 2.3 percent ranked it number 9, 2.3 percent ranked it number 10, and 2.3 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, none ranked answers to study questions number 1, 15.2 percent ranked it number 2, 28.3 percent ranked it number 3, 17.4 percent ranked it number 4, 15.2 percent ranked it number 5, 4.3 percent ranked it number 6, 6.5 percent ranked it number 7, 8.7 percent ranked it number 8, 2.2 percent ranked it number 9, none ranked it number 10, and 2.2 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 5.0 percent ranked answers to study questions number 1, 17.5 percent ranked it number 2, 12.5 percent ranked it number 3, 20.0 percent ranked it number 4, 15.0 percent ranked it number 5, 10.0 percent ranked it number 6, 12.5 percent ranked it number 7, 5.0 percent ranked it number 8, 2.5 percent ranked it number 9, and none ranked it either number 10 or 11. The calculated chi-square value is not significant.

Of the respondents in the 50 or Over age group, none ranked answers to study questions number 1, 7.1 percent ranked it number 2, 14.3 percent ranked it number 3, 28.6 percent ranked it number 4, 14.3 percent ranked it number 5, 7.1 percent ranked it number 6, 7.1 percent ranked it number 7, 14.3 percent ranked it number 8, 7.1 percent ranked it number 9, and none ranked it either number 10 or 11. The calculated chi-square value is not significant.
Only the chi-square tests for the Under 30 and the 30-39 age groups are significant. This indicates that for these two groups the observed distribution of responses in Table 106 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 107. Responses by ethnic background to Question 25: Rank the Answers to the Study Questions from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 ( 0.0%)</td>
<td>2 ( 1.6%)</td>
<td>0 ( 0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>2</td>
<td>0 ( 0.0%)</td>
<td>22 (18.0%)</td>
<td>0 ( 0.0%)</td>
<td>3 (30.0%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (20.0%)</td>
<td>23 (18.9%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>4</td>
<td>1 (20.0%)</td>
<td>25 (20.5%)</td>
<td>0 ( 0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>5</td>
<td>1 (20.0%)</td>
<td>18 (14.8%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>1 (20.0%)</td>
<td>9 ( 7.4%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>7</td>
<td>0 ( 0.0%)</td>
<td>8 ( 6.6%)</td>
<td>0 ( 0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (20.0%)</td>
<td>10 ( 8.2%)</td>
<td>1 (33.3%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 ( 0.0%)</td>
<td>4 ( 3.3%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 ( 0.0%)</td>
<td>1 ( 0.8%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>122</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

\(\chi^2=0.000NS; \text{ df}=4\) \(\chi^2=60.623*; \text{ df}=9\) \(\chi^2=0.000NS; \text{ df}=2\) \(\chi^2=2.000NS; \text{ df}=5\)

Of the American Indian respondents, 1 (20.0 percent) ranked answers to study questions number 3, 1 (20.0 percent) ranked it number 4, 1 (20.0 percent) ranked it number 5, 1 (20.0 percent) ranked it number 6 and 1 (20.0 percent) ranked it number 8. None ranked the item higher than number 3 or lower than number 8. The calculated chi-square value is not significant.

Of the Caucasian respondents, 1.6 percent ranked answers to study questions number 1 (most helpful), 18 percent ranked number 2, 18.9 percent ranked it number 3, 20.5 percent ranked it number 4, 14.8 percent ranked it number 5, 7.4 percent ranked it number 6, 6.6 percent ranked it number 7, 8.2 percent ranked it number 8, 3.3 percent
ranked it number 9, 0.8 percent ranked it number 10, and none ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the Black respondents, 1 (33.3 percent) ranked answers to study questions number 3, 1 (33.3 percent) ranked it number 8, and 1 (33.3 percent) ranked it number 11. The calculated chi-square value is not significant.

Of the Hispanic respondents, 10.0 percent ranked answers to study questions number 1, 30.0 percent ranked it number 2, 10.0 percent ranked it number 3, 20.0 percent ranked it number 4, 20.0 percent ranked it number 7, and 10.0 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 107 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 108. Responses by number of courses completed to Question 25: Rank the Answers to the Study Questions from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (4.3%)</td>
<td>2 (3.6%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>9 (19.6%)</td>
<td>12 (21.4%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>3</td>
<td>5 (10.9%)</td>
<td>12 (21.4%)</td>
<td>9 (21.4%)</td>
</tr>
<tr>
<td>4</td>
<td>9 (19.6%)</td>
<td>11 (19.6%)</td>
<td>9 (21.4%)</td>
</tr>
<tr>
<td>5</td>
<td>8 (17.4%)</td>
<td>7 (12.5%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>6</td>
<td>3 (6.5%)</td>
<td>3 (5.4%)</td>
<td>4 (9.5%)</td>
</tr>
<tr>
<td>7</td>
<td>4 (8.7%)</td>
<td>3 (5.4%)</td>
<td>3 (7.1%)</td>
</tr>
<tr>
<td>8</td>
<td>4 (8.7%)</td>
<td>3 (5.4%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>9</td>
<td>1 (2.2%)</td>
<td>1 (1.8%)</td>
<td>2 (4.8%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>1 (1.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>1 (2.2%)</td>
<td>1 (1.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>56</td>
<td>42</td>
</tr>
</tbody>
</table>

$\chi^2 = 18.783*; df = 9$  $\chi^2 = 40.643*; df = 10$  $\chi^2 = 8.667NS; df = 7$
Of the respondents in the group which had completed at least 5 courses to date, 4.3 percent ranked answers to study questions number 1 (most helpful), 19.6 percent ranked it number 2, 10.9 percent ranked it number 3, 19.6 percent ranked it number 4, 17.4 percent ranked it number 5, 6.5 percent ranked it number 6, 8.7 percent ranked it number 7, 8.7 percent ranked it number 8, 2.2 percent ranked it number 9, none ranked it number 10, and 2.2 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 course to date, 3.6 percent ranked answers to study questions number 1, 21.4 percent ranked it number 2, 21.4 percent ranked it number 3, 19.6 percent ranked it number 4, 12.5 percent ranked it number 5, 5.4 percent ranked it number 6, 5.4 percent ranked it number 7, 5.4 percent ranked it number 8, 1.8 percent ranked it number 9, 1.8 percent ranked it number 10, and 1.8 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in its first course, none ranked answers to study questions number 1, 11.9 percent ranked it number 2, 21.4 percent ranked it number 3, 21.4 percent ranked it number 4, 11.9 percent ranked it number 5, 9.5 percent ranked it number 6, 7.1 percent ranked it number 7, 11.9 percent ranked it number 8, 4.8 percent ranked it number 9, and none ranked it either number 10 or 11. The calculated chi-square value is not significant.

Only the chi-square tests for the 5 or More group and the 1-4 group are significant. This indicates that for these two groups the observed distribution of responses in Table 108 departs significantly from the distribution of responses expected under the
condition of the hypothesis of no differences in the numbers of responses per response category.

Table 109. Responses by recency of study to Question 25: Rank the Answers to the Study Questions from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 (3.2%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>21 (16.9%)</td>
<td>5 (26.3%)</td>
</tr>
<tr>
<td>3</td>
<td>23 (18.5%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>4</td>
<td>26 (21.0%)</td>
<td>3 (15.8%)</td>
</tr>
<tr>
<td>5</td>
<td>16 (12.9%)</td>
<td>4 (21.1%)</td>
</tr>
<tr>
<td>6</td>
<td>8 (6.5%)</td>
<td>1 (5.3%)</td>
</tr>
<tr>
<td>7</td>
<td>10 (8.1%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>10 (8.1%)</td>
<td>2 (10.5%)</td>
</tr>
<tr>
<td>9</td>
<td>3 (2.4%)</td>
<td>1 (5.3%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>2 (1.6%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>19</td>
</tr>
</tbody>
</table>

\[ \chi^2=70.806^*; \text{ df}=10 \]

\[ \chi^2=4.947\text{NS; df}=6 \]

Of the respondents in the Currently Studying group, 3.2 percent ranked answers to study questions number 1 (most helpful), 16.9 percent ranked it number 2, 18.5 percent ranked it number 3, 21.0 percent ranked it number 4, 12.9 percent ranked it number 5, 6.5 percent ranked it number 6, 8.1 percent ranked it number 7, 8.1 percent ranked it number 8, 2.4 percent ranked it number 9, 0.8 percent ranked it number 10, and 1.6 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied in the past 12 months, none ranked answers to study questions number 1, 26.3 percent ranked it number 2, 15.8 percent ranked it number 3, 15.8 percent ranked it number 4, 21.1 percent ranked it number 5, 5.3 percent ranked it number 6, none ranked it number 7, 10.5 percent ranked it number 8, 5.3 percent ranked it number 9, and none ranked it either numbers 10 or 11. The calculated chi-square value is not significant.
Only the chi-square test for the Currently Studying group is significant. This indicates that for this group the observed distribution of responses in Table 109 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section 11: Self-Test Data

For Question 15, respondents were to locate on a Likert scale their perception of the helpfulness of the self-tests at the end of each lesson in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 110 - 115

Table 110. Responses to Question 15: The self-tests at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>87</td>
<td>58.4</td>
</tr>
<tr>
<td>Agree</td>
<td>54</td>
<td>36.2</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>5</td>
<td>3.4</td>
</tr>
<tr>
<td>Disagree</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>100.0</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 133.389*; \text{ df } = 3 \]

In the chi-square goodness-of-fit test reported in Table 110, a theoretical distribution of expected frequency of 37.3 per response category was used for comparison purposes. With 3 degrees of freedom, a critical chi-square value of 7.815 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 149 respondents to Question 15, more than one-half (58.4 percent) strongly agreed that self-tests helped them succeed in their courses, while more than one-third (36.2 percent)
agreed with the statement. Only 5 respondents (3.4 percent) were neutral, 3 (2 percent) disagreed, and none strongly disagreed. The observed chi-square value of 133.389 shows that the observed distribution of responses in Table 110 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 111. Responses by gender to Question 15: The self-tests at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>100</td>
<td>58 (58.0%)</td>
<td>37 (37.0%)</td>
<td>2 (2.0%)</td>
<td>3 (3.0%)</td>
<td>0 (0.0%)</td>
<td>89.840*; df=3</td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>29 (59.2%)</td>
<td>17 (34.7%)</td>
<td>3 (6.1%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>20.735*; df=2</td>
</tr>
</tbody>
</table>

Of the male respondents, more than one-half (58.0 percent) strongly agreed that self-tests helped them succeed in their courses. Another 37.0 percent agreed. 2 (2.0 percent) were neutral and 3 (3.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, more than one-half (59.2 percent) strongly agreed that self-tests helped them succeed in their courses. Another 34.7 percent agreed. 3 (6.1 percent) were neutral and none chose either of the disagree options. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that for these groups the observed distribution of responses in Table 111 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 112. Responses by age to Question 15: The self-tests at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>25 (55.6%)</td>
<td>18 (40.0%)</td>
<td>2 (4.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>18.533*; df=2</td>
</tr>
<tr>
<td>30-39</td>
<td>49</td>
<td>35 (71.4%)</td>
<td>10 (20.4%)</td>
<td>2 (4.1%)</td>
<td>2 (4.1%)</td>
<td>0 (0.0%)</td>
<td>59.816*; df=3</td>
</tr>
<tr>
<td>40-49</td>
<td>41</td>
<td>21 (51.2%)</td>
<td>19 (46.3%)</td>
<td>1 (2.4%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>17.756*; df=2</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>6 (42.9%)</td>
<td>7 (50.0%)</td>
<td>0 (0.0%)</td>
<td>1 (7.1%)</td>
<td>0 (0.0%)</td>
<td>4.429*; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 age group, more than one-half (55.6 percent) strongly agreed that self-tests helped them succeed in their courses. Another 40.0 percent agreed. 2 (4.4 percent) were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, nearly three-fourths (71.4 percent) strongly agreed that self-tests helped them succeed in their courses. Another 20.4 percent agreed. 2 (4.1 percent) were neutral and 2 (4.1 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, over one-half (51.2 percent) strongly agreed that self-tests helped them succeed in their courses. Another 46.3 percent agreed. 1 (2.4 percent) was neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, 42.9 percent strongly agreed that self-tests helped them succeed in their courses. Another 50.0 percent agreed. None were neutral and 1 (7.1 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for all four age groups are significant. This indicates that the observed distribution of responses in Table 112 departs significantly from the distribution...
of responses expected under the condition of the hypothesis of no differences in the
numbers of responses per response category.

Table 113. Responses by ethnic background to Question 15: The self-tests at the end of
each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>2 (33.3%)</td>
<td>3 (50.0%)</td>
<td>1 (16.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1.000NS; df=2</td>
</tr>
<tr>
<td>Caucasian</td>
<td>121</td>
<td>70 (57.9%)</td>
<td>47 (38.8%)</td>
<td>3 (2.5%)</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
<td>114.339*; df=3</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>1.600NS; df=2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>7 (58.3%)</td>
<td>3 (25.0%)</td>
<td>1 (8.3%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>8.000NS; df=3</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, 33.3 percent strongly agreed that self-tests
helped them succeed in their courses. Another 50.0 percent agreed. 1 (16.7 percent) was
neutral, and none chose either of the disagree options. The calculated chi-square value is
not significant.

Of the Caucasian respondents, over one-half (57.9 percent) strongly agreed that
self-tests helped them succeed in their courses. Another 38.8 percent. 3 (2.5 percent)
were neutral and 1 (0.8 percent) disagreed. None strongly disagreed. The calculated chi-
square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed that self-tests helped
them succeed in their courses. Another 1 (20.0 percent) agreed. None were neutral and 1
(20.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is not
significant.

Of the Hispanic respondents, over one-half (58.3 percent) strongly agreed that
self-tests helped them succeed in their courses. Another one-fourth (25.0 percent) agreed.
1 (8.3 percent) was neutral and 1 (8.3 percent) disagreed. None strongly disagreed. The calculated chi-square value for this group was not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 113 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 114. Responses by number of courses completed to Question 15: The self-tests at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>=5</td>
<td>48</td>
<td>29 (60.4%)</td>
<td>16 (33.3%)</td>
<td>3 (6.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>21.125*; df=2</td>
</tr>
<tr>
<td>1-4</td>
<td>58</td>
<td>39 (67.2%)</td>
<td>16 (27.6%)</td>
<td>0 (0.0%)</td>
<td>3 (5.2%)</td>
<td>0 (0.0%)</td>
<td>34.379*; df=2</td>
</tr>
<tr>
<td>1st Course</td>
<td>43</td>
<td>19 (44.2%)</td>
<td>22 (51.2%)</td>
<td>2 (4.5%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>16.233*; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed at least 5 courses to date, more than one-half (60.4 percent) strongly agreed that self-tests helped them succeed in their courses. Another one-third (33.3 percent) agreed. 3 (6.3 percent) were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the group which has completed between 1 and 4 courses to date, slightly more than two-thirds (67.2 percent) strongly agreed that self-tests helped them succeed in their courses. Another 27.6 percent agreed. None were neutral and 3 (5.2 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in their first course, 44.2 percent strongly agreed that self-tests helped them succeed in their course. Another 51.2
percent agreed. 2 (4.5 percent) were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

The chi-square tests for all three groups are significant. This indicates that for these groups the observed distribution of responses in Table 114 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 115. Responses by recency of study to Question 15: The self-tests at the end of each lesson helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently Studying</td>
<td>127</td>
<td>75 (59.1%)</td>
<td>45 (35.4%)</td>
<td>5 (3.9%)</td>
<td>2 (1.6%)</td>
<td>0 (0.0%)</td>
<td>114.858*;</td>
<td>3</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>19</td>
<td>10 (52.6%)</td>
<td>8 (42.1%)</td>
<td>0 (0.0%)</td>
<td>1 (5.3%)</td>
<td>0 (0.0%)</td>
<td>7.053*;</td>
<td>2</td>
</tr>
</tbody>
</table>

Of the respondents in the group which was currently studying at least one course, more than one-half (59.1 percent) strongly agreed that self-tests helped them succeed in their courses. Another 35.4 percent agreed. 5 (3.9 percent) were neutral and 2 (1.6 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, over one-half (52.6 percent) strongly agreed that self-tests helped them succeed in their courses. Another 42.1 percent agreed. None were neutral and 1 (5.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for both groups are significant. This indicates that for these groups the observed distribution of responses in Table 115 departs significantly from the
distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Question 26 was a parallel to Question 15 (“The Self-Tests at the end of each lesson helped me succeed in the courses”). Whereas Question 15 responses were located on a Likert scale, Question 26 was part of a rank-order set in which the respondents ranked each of the eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus respondents were asked to rank Self-Tests between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 26 appear in Tables 116 – 121.

Table 116. Responses to Question 26: Rank self-tests from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28</td>
<td>19.6</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>21.0</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>19.6</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>11.2</td>
</tr>
<tr>
<td>5</td>
<td>12</td>
<td>8.4</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>8.4</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>4.9</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>100.0</td>
</tr>
</tbody>
</table>

χ² = 75.573*; df = 9

In the chi-square goodness-of-fit test reported in Table 116, a theoretical distribution of expected frequencies of 14.3 per response category was used for comparison purposes. With 9 degrees of freedom, a critical chi-square value of 16.919 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 143 respondents to Question 26, 19.6 percent ranked self-tests number 1 (most helpful),
21 percent ranked it number 2, 19.6 percent ranked it number 3, 11.2 percent ranked it number 4, 8.4 percent ranked it number 5, 8.4 percent ranked it number 6, 4.9 percent ranked it number 7, 2.8 percent ranked it number 8, 2.8 percent ranked it number 9, 1.4 percent ranked it number 10, and none ranked it number 11 (least helpful). The calculated chi-square value of 75.573 shows that the observed distribution of responses in Table 116 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 117. Responses by gender to Question 26: Rank self-tests from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16 (16.8%)</td>
<td>12 (25.0%)</td>
</tr>
<tr>
<td>2</td>
<td>22 (23.2%)</td>
<td>8 (16.7%)</td>
</tr>
<tr>
<td>3</td>
<td>21 (22.1%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>4</td>
<td>8 (8.4%)</td>
<td>8 (16.7%)</td>
</tr>
<tr>
<td>5</td>
<td>8 (8.4%)</td>
<td>4 (8.3%)</td>
</tr>
<tr>
<td>6</td>
<td>9 (9.5%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>7</td>
<td>5 (5.3%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>8</td>
<td>2 (2.1%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>9</td>
<td>3 (3.2%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (1.1%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>95</td>
<td>48</td>
</tr>
</tbody>
</table>

$\chi^2=55.421^*; df=9$  $\chi^2=26.167^*; df=9$

Of the male respondents, 16.8 percent ranked self-tests number 1 (most helpful), 23.2 percent ranked it number 2, 22.1 percent ranked it number 3, 8.4 percent ranked it number 4, 8.4 percent ranked it number 5, 9.5 percent ranked it number 6, 5.3 percent ranked it number 7, 2.1 percent ranked it number 8, 3.2 percent ranked it number 9, 1.2 percent ranked it number 10, and none ranked it number 11 (least helpful). The calculated chi-square value is significant.
Of the female respondents, one-fourth ranked self-tests number 1, 16.7 percent ranked it number 2, 14.6 percent ranked it number 3, 16.7 percent ranked it number 4, 8.3 percent ranked it number 5, 6.3 percent ranked it number 6, 4.2 percent ranked it number 7, 4.2 percent ranked it number 8, 2.1 percent ranked it number 9, 2.1 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that for these groups the observed distribution of responses in Table 117 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 118. Responses by age to Question 26: Rank self-tests from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9 (20.5%)</td>
<td>8 (17.8%)</td>
<td>9 (22.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>2</td>
<td>12 (27.3%)</td>
<td>10 (22.2%)</td>
<td>6 (15.0%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>3</td>
<td>9 (20.5%)</td>
<td>9 (20.0%)</td>
<td>7 (17.5%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>4</td>
<td>2 ( 4.5%)</td>
<td>8 (17.8%)</td>
<td>3 ( 7.5%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>5</td>
<td>2 ( 4.5%)</td>
<td>1 ( 2.2%)</td>
<td>6 (15.0%)</td>
<td>3 (21.4%)</td>
</tr>
<tr>
<td>6</td>
<td>7 (15.9%)</td>
<td>3 ( 6.7%)</td>
<td>2 ( 5.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>7</td>
<td>1 ( 2.3%)</td>
<td>2 ( 4.4%)</td>
<td>3 ( 7.5%)</td>
<td>1 ( 7.1%)</td>
</tr>
<tr>
<td>8</td>
<td>1 ( 2.3%)</td>
<td>0 ( 0.0%)</td>
<td>3 ( 7.5%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 ( 0.0%)</td>
<td>4 ( 8.9%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>1 ( 2.3%)</td>
<td>0 ( 0.0%)</td>
<td>1 ( 2.5%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>45</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

\(\chi^2=30.864;df=8\) \(\chi^2=15.267;df=7\) \(\chi^2=12.650;df=8\) \(\chi^2=1.429;df=5\)

Of the respondents in the Under 30 age group, 20.5 percent ranked self-tests number 1 (most helpful), more than one-fourth (27.3 percent) ranked it number 2, 20.5 percent ranked it number 3, 4.5 percent ranked it number 4, 4.5 percent ranked it number 5, 15.9 percent ranked it number 6, 2.3 percent ranked it number 7, 2.3 percent ranked it
number 8, none ranked it numbers 9 or 10, and 2.3 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, 17.8 percent ranked self-tests number 1, 22.2 percent ranked it number 2, 20.0 percent ranked it number 3, 17.8 percent ranked it number 4, 2.2 percent ranked it number 5, 6.7 percent ranked it number 6, 4.4 percent ranked it number 7, none ranked it number 8, 8.9 percent ranked it number 9, and none ranked it numbers 10 or 11. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 22.5 percent ranked self-tests number 1, 15.0 percent ranked it number 2, 17.5 percent ranked it number 3, 7.5 percent ranked it number 4, 15.0 percent ranked it number 5, 5.0 percent ranked it number 6, 7.5 percent ranked it number 7, 7.5 percent ranked it number 8, none ranked it numbers 9 or 10, and 2.5 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.

Of the respondents in the 50 or Over age group, 14.3 percent ranked self-tests number 1, 14.3 percent ranked it number 2, 21.4 percent ranked it number 3, 21.4 percent ranked it number 4, 21.4 percent ranked it number 5, none ranked it number 6, and 7.1 percent ranked it number 7. None ranked it lower than number 7. The calculated chi-square value is not significant.

Only the chi-square tests for the Under 30 group and the 30-39 group are significant. This indicates that for these groups the observed distribution of responses in Table 118 departs significantly from the distribution of responses expected under the
condition of the hypothesis of no differences in the numbers of responses per response category.

Table 119. Responses by ethnic background to Question 26: Rank self-tests from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (40.0%)</td>
<td>22 (18.2%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>2</td>
<td>1 (20.0%)</td>
<td>25 (20.7%)</td>
<td>1 (33.3%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>3</td>
<td>0 (0.0%)</td>
<td>26 (21.5%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 (0.0%)</td>
<td>15 (12.4%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>5</td>
<td>1 (20.0%)</td>
<td>10 (8.3%)</td>
<td>1 (33.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>0 (0.0%)</td>
<td>12 (9.9%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>7</td>
<td>0 (0.0%)</td>
<td>5 (4.1%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>8</td>
<td>0 (0.0%)</td>
<td>3 (2.5%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>9</td>
<td>0 (0.0%)</td>
<td>2 (1.7%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>10</td>
<td>1 (20.0%)</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>121</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

χ² = 0.600NS; df = 3  χ² = 68.504*; df = 9  χ² = 0.000NS; df = 2  χ² = 1.200NS; df = 6

Of the American Indian respondents, 2 (40.0 percent) ranked self-tests number 1 (most helpful), 1 (20.0 percent) ranked it number 2, 1 (20.0 percent) ranked it number 5, and 1 (20.0 percent) ranked it number 10. The calculated chi-square value is not significant.

Of the Caucasian respondents, 18.2 percent ranked self-tests number 1, 20.7 percent ranked it number 2, 21.5 percent ranked it number 3, 12.4 percent ranked it number 4, 8.3 percent ranked it number 5, 9.9 percent ranked it number 6, 4.1 percent ranked it number 7, 2.5 percent ranked it number 8, 1.7 percent ranked it number 9, 0.8 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is significant.
Of the Black respondents, 1 (33.3 percent) ranked self-tests number 2, 1 (33.3 percent) ranked it number 5, and 1 (33.3 percent) ranked it number 9. The calculated chi-square value is not significant.

Of the Hispanic respondents, 20.0 percent ranked self-tests number 1, 20.0 percent ranked it number 2, 20.0 percent ranked it number 3, 10.0 percent ranked it number 4, none ranked it numbers 5 or 6, 10.0 percent ranked it number 7, 10.0 percent ranked it number 8, 10.0 percent ranked it number 9, and none ranked it numbers 10 or 11. The calculated chi-square value is not significant.

Only the chi-square test for the Caucasian group is significant. This indicates that for this group the observed distribution of responses in Table 119 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 120. Responses by number of courses completed to Question 26: Rank self-tests from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10 (22.2%)</td>
<td>9 (16.1%)</td>
<td>9 (21.4%)</td>
</tr>
<tr>
<td>2</td>
<td>8 (17.8%)</td>
<td>15 (26.8%)</td>
<td>7 (16.7%)</td>
</tr>
<tr>
<td>3</td>
<td>10 (22.2%)</td>
<td>14 (25.0%)</td>
<td>4 ( 9.5%)</td>
</tr>
<tr>
<td>4</td>
<td>4 (  8.9%)</td>
<td>8 (14.3%)</td>
<td>4 ( 9.5%)</td>
</tr>
<tr>
<td>5</td>
<td>6 (13.3%)</td>
<td>2 ( 3.6%)</td>
<td>4 ( 9.5%)</td>
</tr>
<tr>
<td>6</td>
<td>3 (  6.7%)</td>
<td>3 ( 5.4%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>7</td>
<td>1 (  2.2%)</td>
<td>3 ( 5.4%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>8</td>
<td>1 (  2.2%)</td>
<td>0 ( 0.0%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>9</td>
<td>2 (  4.4%)</td>
<td>2 ( 3.6%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (  0.0%)</td>
<td>0 ( 0.0%)</td>
<td>2 ( 4.8%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (  0.0%)</td>
<td>0 ( 0.0%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>56</td>
<td>42</td>
</tr>
</tbody>
</table>

$\chi^2=21.200^*; \ df=8$ $\chi^2=28.571^*; \ df=7$ $\chi^2=8.571NS; \ df=8$
Of the respondents in the group which had completed at least 5 courses to date, 22.2 percent ranked self-tests number 1 (most helpful), 17.8 percent ranked it number 2, 22.2 percent ranked it number 3, 8.9 percent ranked it number 4, 13.3 percent ranked it number 5, 6.7 percent ranked it number 6, 2.2 percent ranked it number 7, 2.2 percent ranked it number 8, 4.4 percent ranked it number 9, and none ranked it numbers 10 or 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, 16.1 percent ranked self-tests number 1, more than one-fourth (26.8 percent) ranked it number 2, one-fourth (25.0 percent) ranked it number 3, 14.3 percent ranked it number 4, 3.6 percent ranked it number 5, 5.4 percent ranked it number 6, 5.4 percent ranked it number 7, none ranked it number 8, 3.6 percent ranked it number 9, and none ranked it numbers 10 or 11. The calculated chi-square value is significant.

Of the respondents in the group which was currently enrolled in their first course, 21.4 percent ranked self-tests number 1, 16.7 percent ranked it number 2, 9.5 percent ranked it number 3, 9.5 percent ranked it number 4, 9.5 percent ranked it number 5, 14.3 percent ranked it number 6, 7.1 percent ranked it number 7, 7.1 percent ranked it number 8, none ranked it number 9, 4.8 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square tests for the 5 or More group and the 1-4 group are significant. This indicates that for these groups the observed distribution of responses in Table 120 departs significantly from the distribution of responses expected under the
condition of the hypothesis of no differences in the numbers of responses per response category.

Table 121. Responses by recency of study to Question 26: Rank self-tests from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27 (21.8%)</td>
<td>1 (5.6%)</td>
</tr>
<tr>
<td>2</td>
<td>25 (20.2%)</td>
<td>5 (27.8%)</td>
</tr>
<tr>
<td>3</td>
<td>21 (16.9%)</td>
<td>7 (38.9%)</td>
</tr>
<tr>
<td>4</td>
<td>14 (11.3%)</td>
<td>2 (11.1%)</td>
</tr>
<tr>
<td>5</td>
<td>11 (8.9%)</td>
<td>1 (5.6%)</td>
</tr>
<tr>
<td>6</td>
<td>11 (8.9%)</td>
<td>1 (5.6%)</td>
</tr>
<tr>
<td>7</td>
<td>5 (4.0%)</td>
<td>1 (5.6%)</td>
</tr>
<tr>
<td>8</td>
<td>4 (3.2%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>4 (3.2%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>2 (1.6%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>18</td>
</tr>
</tbody>
</table>

$\chi^2=61.000^*; \ df=9 \quad \chi^2=13.889^*; \ df=6$

Of the respondents in the group which was currently studying at least one course, 21.8 percent ranked self-tests number 1 (most helpful), 20.2 percent ranked it number 2, 16.9 percent ranked it number 3, 11.3 percent ranked it number 4, 8.9 percent ranked it number 5, 8.9 percent ranked it number 6, 4 percent ranked it number 7, 3.2 percent ranked it number 8, 3.2 percent ranked it number 9, 1.6 percent ranked it number 10, and none ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, 5.6 percent ranked self-tests number 1, 27.8 percent ranked it number 2, more than one-third (38.9 percent) ranked it number 3, 11.1 percent ranked it number 4, 5.6 percent ranked it number 5, 5.6 percent ranked it number 6, and 5.6 percent ranked it number 7. None ranked the item lower than number 7. The calculated chi-square value is significant.
The chi-square tests for both groups are significant. This indicates that for these groups the observed distribution of responses in Table 121 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Section 12: UPE Data

For Question 16, respondents were to locate on a Likert scale their perception of the helpfulness of the UPE’s at the end of each unit in distance education materials published by Global University. The response categories for the question were strongly agree, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The results of statistical tests on the responses to Question 6 appear in Tables 122 – 127.

Table 122. Responses to Question 16: The UPE’s at the end of each unit helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Response</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>68</td>
<td>45.6</td>
</tr>
<tr>
<td>Agree</td>
<td>59</td>
<td>39.6</td>
</tr>
<tr>
<td>Neutral (neither agree nor disagree)</td>
<td>19</td>
<td>12.8</td>
</tr>
<tr>
<td>Disagree</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>149</td>
<td>100.0</td>
</tr>
</tbody>
</table>

$\chi^2 = 78.517^*; \ df = 3$

In the chi-square goodness-of-fit test reported in Table 122, a theoretical distribution of expected frequency of 37.3 per response category was used for comparison purposes. With 3 degrees of freedom, a critical chi-square value of 7.815 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 149 respondents to Question 16, 44.7 strongly agreed that UPE’s helped them succeed in their courses, while another 38.8 percent agreed with the statement. 19 respondents (12.5
percent) were neutral, 3 (2 percent) disagreed, and none strongly disagreed. The observed chi-square value of 78.517 shows that the observed distribution of responses in Table 122 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 123. Responses by gender to Question 16: The UPE’s at the end of each unit helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>100</td>
<td>46 (46.0%)</td>
<td>40 (40.0%)</td>
<td>11 (11.0%)</td>
<td>3 (3.0%)</td>
<td>0 (0.0%)</td>
<td>53.840*; df=3</td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>22 (44.9%)</td>
<td>19 (38.8%)</td>
<td>8 (16.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>6.653*; df=2</td>
</tr>
</tbody>
</table>

Of the male respondents, slightly less than one-half (46.0 percent) strongly agreed that UPE’s helped them succeed in their courses. Another 40.0 percent, 11.0 percent were neutral and 3.0 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the female respondents, slightly less than one-half (44.9 percent) strongly agreed that UPE’s helped them succeed in their courses. Another 38.8 percent agreed. 16.3 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

The chi-square tests for both gender groups are significant. This indicates that for these groups the observed distribution of responses in Table 123 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 124. Responses by age to Question 16: The UPE’s at the end of each unit helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 30</td>
<td>45</td>
<td>18 (40.0%)</td>
<td>19 (42.2%)</td>
<td>8 (17.8%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>4.933*; df=2</td>
</tr>
<tr>
<td>30-39</td>
<td>49</td>
<td>30 (61.2%)</td>
<td>11 (22.4%)</td>
<td>6 (12.2%)</td>
<td>2 (4.1%)</td>
<td>0 (0.0%)</td>
<td>37.612*; df=3</td>
</tr>
<tr>
<td>40-49</td>
<td>41</td>
<td>16 (39.0%)</td>
<td>20 (48.8%)</td>
<td>5 (12.2%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>8.829*; df=2</td>
</tr>
<tr>
<td>50 or Over</td>
<td>14</td>
<td>4 (28.6%)</td>
<td>9 (64.3%)</td>
<td>0 (0.0%)</td>
<td>1 (7.1%)</td>
<td>0 (0.0%)</td>
<td>7.000*; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the Under 30 age group, 40.0 percent strongly agreed that UPE’s helped them succeed in their courses. Another 42.2 percent agreed. 17.8 percent were neutral and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the 30-39 age group, more than one-half (61.2 percent) strongly agreed that UPE’s helped them succeed in their courses. Another 22.4 percent agreed 12.2 percent were neutral and 4.1 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 39.0 percent strongly agreed that UPE’s helped them succeed in their courses. Another 48.8 percent agreed. 12.2 percent were neutral and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the 50 or Over age group, 28.6 percent strongly agreed that UPE’s helped them succeed in their courses. Another 64.3 percent agreed. None were neutral and 1 (7.1 percent) disagreed. None strongly disagreed. The calculated chi-square value is significant.

The chi-square tests for all four age groups are significant. This indicates that the observed distribution of responses in Table 124 departs significantly from the distribution.
of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 125. Responses by ethnic background to Question 16: The UPE’s at the end of each unit helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Ethnic Backgr’d</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Am. Indian</td>
<td>6</td>
<td>1 (16.7%)</td>
<td>3 (50.0%)</td>
<td>2 (33.3%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>1.000NS; df=2</td>
</tr>
<tr>
<td>Caucasian</td>
<td>121</td>
<td>56 (46.3%)</td>
<td>52 (43.0%)</td>
<td>12 (9.9%)</td>
<td>1 (0.8%)</td>
<td>0 (0.0%)</td>
<td>76.851*; df=3</td>
</tr>
<tr>
<td>Black</td>
<td>5</td>
<td>3 (60.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>1 (20.0%)</td>
<td>0 (0.0%)</td>
<td>1.600NS; df=2</td>
</tr>
<tr>
<td>Hispanic</td>
<td>12</td>
<td>4 (33.3%)</td>
<td>3 (25.0%)</td>
<td>4 (33.3%)</td>
<td>1 (8.3%)</td>
<td>0 (0.0%)</td>
<td>2.000NS; df=3</td>
</tr>
</tbody>
</table>

Of the American Indian respondents, 1 (16.7 percent) strongly agreed that UPE’s helped them succeed in their courses. Another 3 (50.0 percent) agreed. 2 (33.3 percent) were neutral, and none chose either of the disagree options. The calculated chi-square value is not significant.

Of the Caucasian respondents, slightly less than one-half (46.3 percent) strongly agreed that UPE’s helped them succeed in their courses. Another 43.0 percent agreed. 9.9 percent were neutral and 0.8 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the Black respondents, 3 (60.0 percent) strongly agreed that UPE’s helped them succeed in their courses. Another 1 (20.0 percent) agreed. None were neutral and 1 (20.0 percent) disagreed. None strongly disagreed. The calculated chi-square value is not significant.

Of the Hispanic respondents, 4 (33.3 percent) strongly agreed that UPE’s helped them succeed in their courses. Another 3 (25.0 percent) agreed. 4 (33.3 percent) were neutral and 1 (8.3 percent) disagreed. None strongly disagreed. The calculated chi-square value is not significant.
Only the chi-square test for the Caucasian group is significant. This indicates that for the Caucasian group the observed distribution of responses in Table 125 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 126. Responses by number of courses completed to Question 16: The UPE’s at the end of each unit helped me succeed in the courses.

<table>
<thead>
<tr>
<th>No. of Courses</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;=5</td>
<td>48</td>
<td>21 (43.8%)</td>
<td>19 (39.6%)</td>
<td>8 (16.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>6.125*; df=2</td>
</tr>
<tr>
<td>1-4</td>
<td>58</td>
<td>33 (56.9%)</td>
<td>17 (29.3%)</td>
<td>5 ( 8.6%)</td>
<td>3 (5.2%)</td>
<td>0 (0.0%)</td>
<td>39.379*; df=3</td>
</tr>
<tr>
<td>1st Course</td>
<td>43</td>
<td>14 (32.6%)</td>
<td>23 (53.5%)</td>
<td>6 (14.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>10.093*; df=2</td>
</tr>
</tbody>
</table>

Of the respondents in the group which had completed at least 5 courses to date, 43.8 percent strongly agreed that UPE’s helped them succeed in their courses. Another 39.6 percent agreed. 16.7 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, over one-half (56.9 percent) strongly agreed that UPE’s helped them succeed in their courses. Another 29.3 percent agreed. 8.6 percent were neutral and 5.2 percent disagreed. None strongly disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was enrolled in its first course, slightly less than one-third (32.6 percent) strongly agreed that UPE’s helped them succeed in their course. Another 53.5 percent agreed. 14.0 percent were neutral, and none chose either of the disagree options. The calculated chi-square value is significant.

The chi-square tests for all three groups are significant. This indicates that the observed distribution of responses in Table 126 departs significantly from the distribution
of responses expected under the condition of the hypothesis of no differences in the
to Question 16: The UPE’s at the end of each
unit helped me succeed in the courses.

<table>
<thead>
<tr>
<th>Last Time Studied</th>
<th>N</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently Studying</td>
<td>127</td>
<td>58 (45.7%)</td>
<td>50 (39.4%)</td>
<td>17 (13.4%)</td>
<td>2 (1.6%)</td>
<td>0 (0.0%)</td>
<td>66.921*; df=3</td>
</tr>
<tr>
<td>Within last 12 months</td>
<td>19</td>
<td>8 (42.1%)</td>
<td>9 (47.4%)</td>
<td>1 (5.3%)</td>
<td>1 (5.3%)</td>
<td>0 (0.0%)</td>
<td>11.947*; df=3</td>
</tr>
</tbody>
</table>

Of the respondents in the group which was currently studying at least one course,
45.7 percent strongly agreed that UPE’s helped them succeed in their courses. Another
39.4 percent agreed. 13.4 percent were neutral and 1.6 percent disagreed. None strongly
disagreed. The calculated chi-square value is significant.

Of the respondents in the group which was not currently studying but had studied
within the past 12 months, 42.1 percent strongly agreed that UPE’s helped them succeed
in their courses. Another 47.4 percent agreed. 1 (5.3 percent) was neutral and 1 (5.3
percent) disagreed. None strongly disagreed. The calculated chi-square value is
significant.

The chi-square tests for both groups are significant. This indicates that the
observed distribution of responses in Table 127 departs significantly from the distribution
of responses expected under the condition of the hypothesis of no differences in the
numbers of responses per response category.

Question 27 was a parallel to Question 16 (“The UPE’s at the end of each unit
helped me succeed in the courses”). Whereas Question 16 responses were located on a
Likert scale, Question 27 was part of a rank-order set in which the respondents ranked
each of the eleven instructional development factors from 1 to 11, with 1 being the most helpful and 11 the least helpful in achieving success in the courses. Thus respondents were asked to rank UPE’s between 1 and 11 on the rank-order scale. The results of statistical tests on the responses to Question 27 appear in Tables 128 – 133.

**Table 128. Responses to Question 27: Rank UPE’s at the end of each unit from 1 to 11 in order of helpfulness in successful course completion.**

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>21</td>
<td>14.7</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>9.8</td>
</tr>
<tr>
<td>3</td>
<td>16</td>
<td>11.2</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>11.9</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td>10.5</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>8.4</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>7.7</td>
</tr>
<tr>
<td>9</td>
<td>15</td>
<td>10.5</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>4.2</td>
</tr>
<tr>
<td>11</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>Total</td>
<td>143</td>
<td>100.0</td>
</tr>
</tbody>
</table>

In the chi-square goodness-of-fit test reported in Table 128, a theoretical distribution of expected frequencies of 13.0 per response category was used for comparison purposes. With 10 degrees of freedom, a critical chi-square value of 18.307 was required for significance at the .05 level of probability (Hinkle, et al., 1998). Of the 143 respondents to Question 27, 14.7 percent ranked UPE’s number 1 (most helpful), 9.8 percent ranked it number 2, 11.2 percent ranked it number 3, 11.9 percent ranked it number 4, 10.5 percent ranked it number 5, 8.4 percent ranked it number 6, 5.6 percent ranked it number 7, 7.7 percent ranked it number 8, 10.5 percent ranked it number 9, 4.2 percent ranked it number 10, and 5.6 percent ranked it number 11 (least helpful). The calculated chi-square value of 15.538 shows that the observed distribution of responses in
Table 128 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 129. Responses by gender to Question 27: Rank UPE’s at the end of each unit from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18 (18.9%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>2</td>
<td>8 (8.4%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>3</td>
<td>9 (9.5%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>4</td>
<td>14 (14.7%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>5</td>
<td>9 (9.5%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>6</td>
<td>7 (7.4%)</td>
<td>5 (10.4%)</td>
</tr>
<tr>
<td>7</td>
<td>5 (5.3%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>8</td>
<td>10 (10.5%)</td>
<td>1 (2.1%)</td>
</tr>
<tr>
<td>9</td>
<td>6 (6.3%)</td>
<td>9 (18.8%)</td>
</tr>
<tr>
<td>10</td>
<td>4 (4.2%)</td>
<td>2 (4.2%)</td>
</tr>
<tr>
<td>11</td>
<td>5 (5.3%)</td>
<td>3 (6.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>95</td>
<td>48</td>
</tr>
</tbody>
</table>

$\chi^2=20.442; df=10$  $\chi^2=13.410 NS; df=10$

Of the male respondents, 18.9 percent ranked UPE’s number 1 (most helpful), 8.4 percent ranked it number 2, 9.5 percent ranked it number 3, 14.7 percent ranked it number 4, 9.5 percent ranked it number 5, 7.4 percent ranked it number 6, 5.3 percent ranked it number 7, 10.5 percent ranked it number 8, 6.3 percent ranked it number 9, 4.2 percent ranked it number 10, and 5.3 percent ranked it number 11 (least helpful). The calculated chi-square value is significant.

Of the female respondents, 6.3 percent ranked UPE’s number 1, 12.5 percent ranked it number 2, 14.6 percent ranked it number 3, 6.3 percent ranked it number 4, 12.5 percent ranked it number 5, 10.4 percent ranked it number 6, 6.3 percent ranked it number 7, 2.1 percent ranked it number 8, 18.8 percent ranked it number 9, 4.2 percent
ranked it number 10, and 6.3 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for males is significant. This indicates that for the male group the observed distribution of responses in Table 129 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 130. Responses by age to Question 27: Rank UPE’s at the end of each unit from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Under 30</th>
<th>30-39</th>
<th>40-49</th>
<th>50 or Over</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 (13.6%)</td>
<td>9 (20.0%)</td>
<td>5 (12.5%)</td>
<td>1 ( 7.1%)</td>
</tr>
<tr>
<td>2</td>
<td>4 ( 9.1%)</td>
<td>5 (11.1%)</td>
<td>3 ( 7.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>3</td>
<td>7 (15.9%)</td>
<td>4 ( 8.9%)</td>
<td>3 ( 7.5%)</td>
<td>2 (14.3%)</td>
</tr>
<tr>
<td>4</td>
<td>6 (13.6%)</td>
<td>5 (11.1%)</td>
<td>5 (12.5%)</td>
<td>1 ( 7.1%)</td>
</tr>
<tr>
<td>5</td>
<td>4 ( 9.1%)</td>
<td>8 (17.8%)</td>
<td>3 ( 7.5%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>6</td>
<td>2 ( 4.5%)</td>
<td>1 ( 2.2%)</td>
<td>3 ( 7.5%)</td>
<td>6 (42.9%)</td>
</tr>
<tr>
<td>7</td>
<td>2 ( 4.5%)</td>
<td>3 ( 6.7%)</td>
<td>3 ( 7.5%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>4 ( 9.1%)</td>
<td>4 ( 8.9%)</td>
<td>2 ( 5.0%)</td>
<td>1 ( 7.1%)</td>
</tr>
<tr>
<td>9</td>
<td>6 (13.6%)</td>
<td>2 ( 4.4%)</td>
<td>7 (17.5%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>10</td>
<td>1 ( 2.3%)</td>
<td>2 ( 4.4%)</td>
<td>3 ( 7.5%)</td>
<td>0 ( 0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>2 ( 4.5%)</td>
<td>2 ( 4.4%)</td>
<td>3 ( 7.5%)</td>
<td>1 ( 7.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>45</td>
<td>40</td>
<td>14</td>
</tr>
</tbody>
</table>

χ² = 10.500 NS; χ² = 15.867*; χ² = 5.650 NS; χ² = 10.000 NS; df = 10; df = 10; df = 10; df = 6

Of the respondents in the Under 30 age group, 13.6 percent ranked UPE’s number 1 (most helpful), 9.1 percent ranked it number 2, 15.9 percent ranked it number 3, 13.6 percent ranked it number 4, 9.1 percent ranked it number 5, 4.5 percent ranked it number 6, 4.5 percent ranked it number 7, 9.1 percent ranked it number 8, 13.6 percent ranked it number 9, 2.3 percent ranked it number 10, and 4.5 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.
Of the respondents in the 30-39 age group, 20.0 percent ranked UPE’s number 1, 11.1 percent ranked it number 2, 8.9 percent ranked it number 3, 11.1 percent ranked it number 4, 17.8 percent ranked it number 5, 2.2 percent ranked it number 6, 6.7 percent ranked it number 7, 8.9 percent ranked it number 8, 4.4 percent ranked it number 9, 4.4 percent ranked it number 10, and 4.4 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the 40-49 age group, 12.5 percent ranked UPE’s number 1, 7.5 percent ranked it number 2, 7.5 percent ranked it number 3, 12.5 percent ranked it number 4, 7.5 percent ranked it number 5, 7.5 percent ranked it number 6, 7.5 percent ranked it number 7, 5 percent ranked it number 8, 17.5 percent ranked it number 9, 7.5 percent ranked it number 10, and 7.5 percent ranked it number 11. The calculated chi-square value is not significant.

Of the respondents in the 50 or Over age group, 7.1 percent ranked UPE’s number 1, 14.3 percent ranked it number 2, 14.3 percent ranked it number 3, 7.1 percent ranked it number 4, none ranked it number 5, 42.9 percent ranked it number 6, none ranked it number 7, 7.1 percent ranked it number 8, none ranked it either number 9 or 10, and 7.1 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the 30-39 age group is significant. This indicates that for this group the observed distribution of responses in Table 130 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 131. Responses by ethnic background to Question 27: Rank UPE’s at the end of each unit from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>American Indian</th>
<th>Caucasian</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 (0.0%)</td>
<td>19 (15.7%)</td>
<td>1 (33.3%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>2</td>
<td>2 (40.0%)</td>
<td>11 (9.1%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>3</td>
<td>1 (20.0%)</td>
<td>12 (9.9%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>4</td>
<td>0 (0.0%)</td>
<td>17 (14.0%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>5</td>
<td>0 (0.0%)</td>
<td>12 (9.9%)</td>
<td>0 (0.0%)</td>
<td>3 (30.0%)</td>
</tr>
<tr>
<td>6</td>
<td>1 (20.0%)</td>
<td>9 (7.4%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>7</td>
<td>0 (0.0%)</td>
<td>8 (6.6%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>8</td>
<td>0 (0.0%)</td>
<td>10 (8.3%)</td>
<td>0 (0.0%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>9</td>
<td>1 (20.0%)</td>
<td>12 (9.9%)</td>
<td>0 (0.0%)</td>
<td>2 (20.0%)</td>
</tr>
<tr>
<td>10</td>
<td>0 (0.0%)</td>
<td>4 (3.3%)</td>
<td>1 (33.3%)</td>
<td>1 (10.0%)</td>
</tr>
<tr>
<td>11</td>
<td>0 (0.0%)</td>
<td>7 (5.8%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>5</td>
<td>121</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

χ²=0.600NS; χ²=16.545NS; χ²=0.000NS; χ²=2.000NS; df=3; df=10; df=2; df=5

Of the American Indian respondents, 2 (40.0 percent) ranked UPE’s number 2, 1 (20.0 percent) ranked it number 3, 1 (20.0 percent) ranked it number 6, and 1 (20.0 percent) ranked it number 9. None ranked it number 1 (most helpful) or number 11 (least helpful). The calculated chi-square value is not significant.

Of the Caucasian respondents, 15.7 percent ranked UPE’s number 1, 9.1 percent ranked it number 2, 9.9 percent ranked it number 3, 14.0 percent ranked it number 4, 9.9 percent ranked it number 5, 7.4 percent ranked it number 6, 6.6 percent ranked it number 7, 8.3 percent ranked it number 8, 9.9 percent ranked it number 9, 3.3 percent ranked it number 10, and 5.8 percent ranked it number 11. The calculated chi-square value is not significant.

Of the Black respondents, 1 (33.3 percent) ranked UPE’s number 1, 1 (33.3 percent) ranked it number 6, and 1 (33.3 percent) ranked it number 10. The calculated chi-square value is not significant.
Of the Hispanic respondents, none ranked it numbers 1 or 2, 20.0 percent ranked it number 3, none ranked it number 4, 30.0 percent ranked it number 5, 10.0 percent ranked it number 6, none ranked it number 7, 10.0 percent ranked it number 8, 20.0 percent ranked it number 9, 10.0 percent ranked it number 10, and none ranked it number 11. The calculated chi-square value is not significant.

None of the chi-square tests are significant. This indicates that the observed distribution of responses in Table 131 does not represent a significant departure from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.

Table 132. Responses by number of courses completed to Question 27: Rank UPE’s at the end of each unit from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>5 or More</th>
<th>1-4</th>
<th>Currently Enrolled in First Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 (11.1%)</td>
<td>12 (21.4%)</td>
<td>4 ( 9.5%)</td>
</tr>
<tr>
<td>2</td>
<td>6 (13.3%)</td>
<td>3 ( 5.4%)</td>
<td>5 (11.9%)</td>
</tr>
<tr>
<td>3</td>
<td>5 (11.1%)</td>
<td>9 (16.1%)</td>
<td>2 ( 4.8%)</td>
</tr>
<tr>
<td>4</td>
<td>6 (13.3%)</td>
<td>8 (14.3%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>5</td>
<td>5 (11.1%)</td>
<td>4 ( 7.1%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>6</td>
<td>4 ( 8.9%)</td>
<td>5 ( 8.9%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>7</td>
<td>2 ( 4.4%)</td>
<td>2 ( 3.6%)</td>
<td>4 ( 9.5%)</td>
</tr>
<tr>
<td>8</td>
<td>3 ( 6.7%)</td>
<td>4 ( 7.1%)</td>
<td>4 ( 9.5%)</td>
</tr>
<tr>
<td>9</td>
<td>5 (11.1%)</td>
<td>4 ( 7.1%)</td>
<td>6 (14.3%)</td>
</tr>
<tr>
<td>10</td>
<td>2 ( 4.4%)</td>
<td>2 ( 3.6%)</td>
<td>2 ( 4.8%)</td>
</tr>
<tr>
<td>11</td>
<td>2 ( 4.4%)</td>
<td>3 ( 5.4%)</td>
<td>3 ( 7.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>56</td>
<td>42</td>
</tr>
</tbody>
</table>

χ²=6.089NS;df=10  χ²=20.214*;df=10  χ²=5.143NS;df=10

Of the respondents in the group which had completed at least 5 courses to date, 11.1 percent ranked UPE’s number 1 (most helpful), 13.3 percent ranked it number 2, 11.1 percent ranked it number 3, 13.3 percent ranked it number 4, 11.1 percent ranked it number 5, 8.9 percent ranked it number 6, 4.4 percent ranked it number 7, 6.7 percent
ranked it number 8, 11.1 percent ranked it number 9, 4.4 percent ranked it number 10, and 4.4 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.

Of the respondents in the group which had completed between 1 and 4 courses to date, 21.4 percent ranked UPE’s number 1, 5.4 percent ranked it number 2, 16.1 percent ranked it number 3, 14.3 percent ranked it number 4, 7.1 percent ranked it number 5, 8.9 percent ranked it number 6, 3.6 percent ranked it number 7, 7.1 percent ranked it number 8, 7.1 percent ranked it number 9, 3.6 percent ranked it number 10, and 5.4 percent ranked it number 11. The calculated chi-square value is significant.

Of the respondents in the group which was currently enrolled in its first course, 9.5 percent ranked UPE’s number 1, 11.9 percent ranked it number 2, 4.8 percent ranked it number 3, 7.1 percent ranked it number 4, 14.3 percent ranked it number 5, 7.1 percent ranked it number 6, 9.5 percent ranked it number 7, 9.5 percent ranked it number 8, 14.3 percent ranked it number 9, 4.8 percent ranked it number 10, and 7.1 percent ranked it number 11. The calculated chi-square value is not significant.

Only the chi-square test for the group which had completed between 1 and 4 courses is significant. This indicates that for this group the observed distribution of responses in Table 132 departs significantly from the distribution of responses expected under the condition of the hypothesis of no differences in the numbers of responses per response category.
Table 133. Responses by recency of study to Question 27: Rank UPE’s at the end of each unit from 1 to 11 in order of helpfulness in successful course completion.

<table>
<thead>
<tr>
<th>Response</th>
<th>Currently Studying</th>
<th>Within Past 12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17 (13.7%)</td>
<td>4 (22.2%)</td>
</tr>
<tr>
<td>2</td>
<td>13 (10.5%)</td>
<td>1 (5.6%)</td>
</tr>
<tr>
<td>3</td>
<td>13 (10.5%)</td>
<td>3 (16.7%)</td>
</tr>
<tr>
<td>4</td>
<td>15 (12.1%)</td>
<td>2 (11.1%)</td>
</tr>
<tr>
<td>5</td>
<td>13 (10.5%)</td>
<td>2 (11.1%)</td>
</tr>
<tr>
<td>6</td>
<td>10 (8.1%)</td>
<td>2 (11.1%)</td>
</tr>
<tr>
<td>7</td>
<td>6 (4.8%)</td>
<td>2 (11.1%)</td>
</tr>
<tr>
<td>8</td>
<td>11 (8.9%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>9</td>
<td>14 (11.3%)</td>
<td>1 (5.6%)</td>
</tr>
<tr>
<td>10</td>
<td>5 (4.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>11</td>
<td>7 (5.6%)</td>
<td>1 (5.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>124</td>
<td>18</td>
</tr>
</tbody>
</table>

χ²=13.323NS; df=10  χ²=4.000NS; df=8

Of the respondents in the group which was currently studying at least one course, 13.7 percent ranked UPE’s number 1 (most helpful), 10.5 percent ranked it number 2, 10.5 percent ranked it number 3, 12.1 percent ranked it number 4, 10.5 percent ranked it number 5, 8.1 percent ranked it number 6, 4.8 percent ranked it number 7, 8.9 percent ranked it number 8, 11.3 percent ranked it number 9, 4.0 percent ranked it number 10, and 5.6 percent ranked it number 11 (least helpful). The calculated chi-square value is not significant.

Of the respondents in the group which was not currently studying but had studied within the past 12 months, 22.2 percent ranked UPE’s number 1, 5.6 percent ranked it number 2, 16.7 percent ranked it number 3, 11.1 percent ranked it number 4, 11.1 percent ranked it number 5, 11.1 percent ranked it number 6, 11.1 percent ranked it number 7, none ranked it number 8, 5.6 percent ranked it number 9, none ranked it number 10, and 5.6 percent ranked it number 11. The calculated chi-square value is not significant.
Neither calculated chi-square test is significant. This indicates that the observed
distribution of responses in Table 133 does not depart significantly from the distribution
of responses expected under the conditions of the hypothesis of no differences in the
numbers of responses per response category.

Section 13: Additional Comments Data

The final section of the questionnaire allowed respondents to make any qualitative
comments concerning the 11 instructional development factors. More than half the
questionnaires (52.6 percent) were returned with no additional comments written in
Section 4 of the questionnaire. Of those that contained comments, a number were not
related to any of the 11 instructional development factors contained in the questionnaire.
The verbatim responses of those comments related to the 11 instructional development
factors appear in Table 134.

Table 134. Additional comments of respondents.

Of the courses I have taken, they have been well organized and set a direction of study.

Charts and graphs have not been used very much in my studies so far.

The study guide questions were very effective in summing up the information. The tests used are very good.

I believe that the instructional development of these courses are very helpful to me in seeking a better understanding of God’s word. However I do have somewhat of a problem with some clerical errors that cause you to take time to correct. Also there has been with the course in New Testament Survey some problems with some of the answers on the UPE’s being wrong or the test answer sheet being wrong.

If color were added to the course, I feel like I could remember more and benefit more also because color coding adds the ability to recall.
I’m presently taking was developed in the early 80’s so the formatting of materials is not as “refined” as those produced by modern computer-aided design. However, I am satisfied that it is an excellent course in its construction and evaluative tools. The objectives are very clear, and the student is given the tools and guidance to meet those objectives.

So far my experience has been good. The college office is very helpful. The only negative has been turn-around time for assignments.

Some information could be more specific. In general it’s ok.

The courses are designed to be very challenging, which is something that’s extremely helpful. A few of the tables and graphs, etc. in Major Prophets were a little confusing, but overall they are superb.

To be honest, I don’t even read the outline or objectives. I do read the words and find their definitions.

I’ve found the courses very organized and helpful for learning. Everything was clear and easy to understand. I was able to take advantage of all the learning tools provided.

Would like open-book tests, or put in more tests after each section and then take final questions from those tests if closed-book. It could show more improvement in the scores from tests to final test and be more instrumental in retaining important pints of each lesson or course.

Lesson openers: I’ve always enjoyed because they set the tempo for the lesson and are helpful segues from previous lesson, regardless whether they reveal much actual “content” of the lesson they open.

Differences in type: I find that I have greater focus and longer attention with what appears to be Times New Roman or Arial than the old typewriter style type. The same applies to “justified margins” over “left-sided margins.”

Graphic art: Specifically for the Hebrew language courses, the “tables” are exceptionally helpful.

I found so many times my dictionary being used.

With technology today, the University should be able to develop more PC-based study questions that give immediate feedback to the student.
I strongly believe that the lesson I am studying right now has helped me learn more than I had ever known. I am just about finished with the book of John and I can strongly say that I can answer or help someone if they don’t understand something.

I really enjoy my classes. I have learned so much. I only wish I had more time to do more classes.

My main complaint on the recent course that I took was information. The workbook serves as a further explanation of the covered material and yet in areas the explanation seemed weak. I wanted more in depth detail in certain areas that were major points in the section.

I think the workbooks need to be reviewed. I found several places the workbook did not correspond with the page numbers cited for reference in the book.

I have found the courses to be interesting and very informative.

Sometimes I’m not sure I understand the way the question is posed.

I prefer essay questions because the answers are really representative of the student’s understanding and comprehension of the topic.

I like the self-paced independent study. I am a shift worker. I would compare the courses as equal to traditional classes at public and private colleges and universities.

Your study guide is put together very well. The only problem that I have is in the area of graphic arts. My biggest problem is with maps. I would like to see more information in with the maps.

The UPE’s and self-tests are essential feedback to assess whether or not I have understood and completely comprehended the subject matter. I have taken several courses that lack UPE’s for the final unit or second half of the study guide. I personally use the UPE’s and self tests as the cornerstone of my review for the final test.

Page references in workbooks are helpful. The more precisely sections within the workbook are broken up and clearly labeled, the better. Large chunks of reading at a time are more difficult. Information is easier for me to absorb if the chapters are clearly broken up into sub-sections and the relevant pages of the textbooks are clearly indicated.
I find it difficult to choose what I like best. The study guide, the self-tests, and UPE tests are all helpful.

I am content with the structure and layout of the worksheets.

Amount of information presented: We need more detailed and pointed explanations.

Written objectives: should be more information.

Study question answers should be mentioned by page number.

The self-tests and UPE’s are great for studying towards the final test.

Grading of UPE’s mailed to University would be beneficial if they were graded and returned to student shortly.

It is difficult to evaluate the importance of artwork and graphics as they contribute to overall attractiveness and ease of use. I will grade these important elements low when compared to the more vital components. However, they do help the course become readable and more “user friendly.”

Some classes do not have UPE’s for the final study guide chapters. They need them.

Overall I think the courses are very good.

I really enjoy having the answers to all study questions in the back of the lesson. They let me know if I am correct in my answer to the question. Some courses do not have the answers there and occasionally I cannot get a direct answer in the textbook.

I do not believe having the course exams closed book helps in any useful manner.

I believe it would be very useful to have the results of my UPE’s returned faster. This would be a great help for me as I study for my final exam. Maybe they could be posted on the Internet or e-mailed.

The information given in each course has been very thorough and extremely helpful.

I would really like to see video lessons incorporated as supplements to the entire course. Also I would like to see more tests within the courses. More review through testing.
I felt that when I took the test for Life of Christ that there were questions asked that I wasn’t properly prepared for. I expected that the questions on the test would have come from progress evaluations or the study questions but I did not feel that they did.

I also find the self-tests quite helpful but the chapters and units quite lengthy. There is a lot of information presented between units and it sometimes gets hard to keep track of it all.

Many of the study questions are written in such a way as to cause me to have to try to determine what the writer of the question means or is looking for rather than checking my apprehension of and progress through the material of study.

To ask a student to follow a line of questions that require piece-meal answers while working through the distance education process is both time-consuming and submitting that student to the necessity of understanding 2 texts, i.e., that which is written and that which is expressed in the mind of the writer of the questions.
CHAPTER V
SUMMARY OF FINDINGS, DISCUSSION, CONCLUSIONS,
AND RECOMMENDATIONS

Summary

This study involved non-experimental research to identify differences in student perceptions of the facilitative nature of instructional development factors used in Global University printed distance education materials. Specifically, the intent of the study was to determine (a) a limited demographic description of Global University students, (b) the association between male and female perceptions of the facilitative nature of instructional development factors, (c) the association between age group perceptions of the facilitative nature of instructional development factors, (d) the association between the perceptions of ethnic groups regarding the facilitative nature of instructional development factors, and (e) the association between perceptions of the facilitative nature of instructional development factors of groups based on exposure to a specific program.

This chapter concludes the study in four parts. The first part summarizes the findings of the study, the second part discusses those findings, the third part draws general conclusions from the study in its relationship to the body of literature on distance education, and the fourth part presents recommendations regarding distance education in general and Global University in particular.
Summary of Findings

After a presentation of the demographic data, the major findings of the study are presented in summary form according to the research questions:

What demographic identity of Global University students emerges from the data?
Two-thirds (66.4 percent) of the respondents were male and one-third (33.6 percent) were female. Nearly one-third (32.9 percent) of the respondents were between 30 and 39 years of age. Another 29.6 percent were under 30 years of age, 28.3 percent were between 40 and 49 years of age, and 9.2 percent were 50 years of age or older.

The majority of the respondents were Caucasian (81.6 percent). Much smaller percentages were Hispanic (7.9 percent), American Indian (3.9 percent), Black (3.3 percent), and Asian (1.3 percent).

The largest percentage of the respondents (38.8 percent) had completed between 1 and 4 courses. Another 32.2 percent had completed 5 or more courses. 28.9 percent were currently enrolled in their first course at the time of this survey.

The majority of the respondents (84.2 percent) were currently studying at least one course. Another 13.8 percent were not currently studying at the time of the survey but had studied within the previous 12 months. Only 2.0 percent had last studied over a year before the survey.

What is the association between male and female student perceptions of the facilitative nature of instructional development factors? 83.0 percent of males agreed/strongly agreed that lesson openers helped them succeed in their courses. 72.5 percent of females agreed/strongly agreed. For both genders, 2.0 percent
disagreed/strongly disagreed. Majorities in both genders (57.2 percent males, 64.6 percent females) ranked the item at the lower end of the scale (numbers 7 – 11).

Concerning lesson artwork, majorities in both genders were neutral. Less than one-fourth of either gender agreed/strongly agreed or disagreed/strongly disagreed that the factor was helpful. Large majorities in both genders ranked the item at the lower end of the scale. Only 4.2 percent of each gender ranked it in the upper end of the scale (numbers 1 – 5).

For lesson outlines, over 80.0 percent of each gender agreed/strongly agreed that the factor was helpful. Both genders were evenly divided on the rank-order scale: 44.9 percent of males ranked the item both in the upper and lower ends of the scale, while 45.8 percent of females ranked it in the upper end and 41.7 percent in the lower end.

Concerning written objectives, over 80.0 percent of each gender agreed/strongly agreed that the factor was helpful. On the rank order scale, 39.6 percent of males ranked the item in the upper end of the scale, 40.6 percent in the lower end. For females, 33.4 percent ranked it in the upper end, and a majority (52.2 percent) ranked it in the lower end.

For the amount of information presented before a study question is asked, over 80.0 percent of both genders agreed/strongly agreed that the factor was helpful. Majorities in both genders ranked the item in the upper end of the scale.

Concerning typographical features, nearly two-thirds of males agreed/strongly agreed while nearly three-fourths of females agreed/strongly agreed that the factor was helpful. For both genders, roughly one-fourth were neutral. Large majorities in both
genders (84.2 percent males, 72.9 percent females) ranked the item in the lower end of the scale.

For graphic art, over 70.0 percent of each gender agreed/strongly agreed that the factor was helpful; 22.0 percent of each gender were neutral. Few of either gender disagreed/strongly disagreed. Large percentages of each gender (81.3 percent males, 70.9 percent females) ranked the item in the lower end of the scale.

Concerning study questions, over 90.0 percent of each gender agreed/strongly agreed that the factor was helpful. Similar percentages (83.3 percent males, 95.8 percent females) ranked the item in the upper end of the scale.

For answers to study questions, large majorities in each gender (94.0 percent males, 89.8 percent females) agreed/strongly agreed that the factor was helpful. Nearly equal percentages of each gender (73.0 percent males, 72.9 percent females) ranked the item in the upper end of the scale.

Concerning self-tests, over 90.0 percent of both genders agreed/strongly agreed that the factor was helpful. Nearly equal majorities in both genders (78.9 percent males, 81.3 percent females) ranked the item in the upper end of the scale.

For UPE’s, over 80.0 percent of each gender agreed/strongly agreed that the factor was helpful. Majorities in both genders ranked the item in the upper end of the scale; roughly one-third of both genders ranked it in the lower end.

What is the association between age-group perceptions of the facilitative nature of instructional development factors? For lesson openers, at least 75.0 percent in all age groups strongly agreed/agreed that the factor was helpful. Considerable percentages
(ranging from 14.3 percent to 21.4 percent) were neutral. Majorities in all age groups except the 50 or Over group (49.9 percent) ranked the item in the lower end of the scale. Conversely, one-fourth to one-third in all groups (except the 50 or Over group, 42.8 percent) ranked the item in the upper end of the scale.

For lesson artwork, most respondents in all age groups were neutral (range: 46.5 percent to 66.7 percent). For the two older age groups, roughly one-third agreed/strongly agreed that the factor was helpful. Considerable percentages also disagreed/strongly disagreed for all but the 50 or Over age group. Over 90.0 percent in all age groups ranked the item in the lower end of the scale. At least 50.0 percent in all age groups ranked the item number 11 (least helpful).

Concerning lesson outlines, majorities in all age groups, ranging from 75.5 percent to 92.0 percent, agreed/strongly agreed that the factor was helpful. On the rank-order scale, majorities are found only at the lower end of the scale for the 30-39 group (54.4 percent) and the upper end of the scale for the 40-49 group (57.5 percent). 49.9 percent of the 50 or Over group ranked the item in the upper end of the scale.

For written objectives, majorities in all age groups, ranging from 73.3 percent to 85.7 percent, agreed/strongly agreed that the factor was helpful. For all age groups, at least one-third ranked the item in the lower end of the scale, while roughly at least one-third ranked the item in the upper half of the scale.

Concerning the amount of information presented before a study question is asked, over 86.0 percent in all age groups agreed/strongly agreed that the factor was helpful. Roughly two-thirds in all age groups ranked the item in the upper end of the scale. The
exception is the 40-49 group, for which 42.5 percent ranked the item both in the upper and lower ends of the scale.

For typographical features, majorities in all age groups, ranging from 63.6 percent to 78.6 percent agreed/strongly agreed that the factor was helpful. Few disagreed in any group, but considerable percentages, ranging from 21.4 to 31.8, were neutral. Large majorities in each age group, ranging from 74.5 percent to 92.9 percent, ranked the item in the lower end of the scale.

Concerning graphic art, between 71.4 and 80.0 percent in all age groups agreed/strongly agreed that the factor was helpful. Few disagreed in any group, but considerable percentages were neutral in each group. Large majorities in each age group, ranging from 74.5 percent to 92.9 percent, ranked the item in the lower end of the scale.

Concerning study questions, large majorities in each age group (over 90.0 percent, including 100.0 percent in the Under 30 group) agreed/strongly agreed that the factor was helpful. Equally large majorities, ranging from 82.9 percent to 92.8 percent, ranked the item in the upper end of the scale.

For answers to study questions, large majorities in each age group, including 100.0 percent of the 40-49 group, agreed/strongly agreed that the factor was helpful. Majorities in each age group, ranging from 64.3 percent to 76.1 percent ranked the item in the upper end of the scale. Considerable percentages, ranging from 18.3 percent to 28.4 percent, also ranked it in the lower end of the scale.
Concerning the self-tests, majorities in over 90.0 percent of each age group agreed/strongly agreed that the factor was helpful. Majorities in each group ranked the item in the upper end of the scale.

For UPE’s, over 80.0 percent in each age group agreed/strongly agreed that the factor was helpful. Majorities in the two younger groups ranked the item in the upper end of the scale, while less than 50.0 percent in the two older groups ranked it in the upper end. Considerable percentages, ranging from 28.8 to 45.0 percent for all but the 50 or Over group (14.2 percent) also ranked the item in the lower end of the scale.

What is the association between ethnic group perceptions of the facilitative nature of instructional development factors? For lesson openers, more than 75.0 percent in all ethnic groups agreed/strongly agreed that the factor was helpful. Few disagreed in any group, but at least 20.0 percent of Black and Caucasian groups were neutral. At least one-half of all groups ranked the item in the upper end of the scale with the exception of the Caucasian group, for which 26.2 percent ranked it in the upper end. Considerable percentages ranked the item in the lower end of the scale, including 63.1 percent of Caucasians.

Concerning lesson artwork, at least one-half of the American Indian and Caucasian groups were neutral. 21.7 percent of the Caucasian group agreed/strongly agreed that the factor was helpful. The majority of all groups ranked the item in the lower end of the scale, including 93.4 percent of Caucasians and 80.0 percent of Hispanics.

For lesson outlines, at least 80.0 percent in each group agreed/strongly agreed that the factor was helpful. On the rank-order scale, groups were fairly evenly divided.
Among Caucasians, for instance, 44.3 percent ranked the item in the upper end of the scale, 45.1 percent in the lower end.

Concerning written objectives, majorities in each group agreed/strongly agreed that the factor was helpful. On the rank order scale, groups were fairly evenly divided. Among Caucasians, 37.7 percent ranked the item in the upper end of the scale, 43.5 percent in the lower end. Among Hispanics, 30.0 percent ranked the item in the upper end, 60.0 percent in the lower end.

For the amount of information presented before a study question is asked, large majorities in each group agreed/strongly agreed that the factor was helpful. Nearly 60.0 percent of Caucasians ranked the item in the upper end of the scale, as did 60.0 percent of Hispanics.

Concerning typographical features, at least two-thirds in all groups agreed/strongly agreed that the factor was helpful. Considerable percentages (Caucasian, 30.1 percent; Hispanic, 25.0 percent) were neutral. Large majorities in Caucasian (80.9 percent) and Hispanic (80.0 percent) ranked the item in the lower end of the scale.

For graphic art, at least roughly three-fourths in all groups agreed/strongly agreed that the factor was helpful; 24.4 percent of Caucasians were neutral. Large majorities in all groups ranked the item in the lower end of the scale, including 77.1 percent of Caucasians and 80.0 percent of Hispanics.

Concerning study questions, large majorities in all groups agreed/strongly agreed that the factor was helpful. Equally large majorities in all groups ranked the item in the
upper end of the scale, including 87.8 percent of Caucasians and 90.0 percent of Hispanics.

For answers to study questions, large majorities in all groups, including 94.2 percent of Caucasians and 75.0 percent of Hispanics, agreed/strongly agreed that the factor was helpful. Slightly smaller majorities in all groups except Blacks ranked the item in the upper end of the scale.

Concerning self-tests, at least 80.0 percent in all groups agreed/strongly agreed that the factor was helpful. Majorities in all groups ranked the item in the upper end of the scale.

For UPE’s, majorities in all groups, ranging from 58.3 percent to 89.3 percent, agreed/strongly agreed that the factor was helpful. At least 50.0 percent in all groups except Blacks ranked the item in the upper end of the scale. Another 33.9 percent of Caucasians and 40.0 percent of Hispanics ranked it in the lower end of the scale.

What is the difference in perceptions of the facilitative nature of instructional development factors between groups that have completed more courses and groups that have completed fewer courses? For lesson openers, at least 75.0 percent in each group agreed/strongly agreed that the factor was helpful. Few disagreed, but considerable percentages (up to 22.4 percent) of each group were neutral. Majorities in each group ranked the item in the lower end of the scale. Considerable percentages (between 21.6 percent and 37.0 percent) also ranked the item in the upper.

Concerning lesson artwork, most respondents in each group were neutral. Roughly one-fourth of all groups agreed/strongly agreed that the factor was helpful. For
the two more experienced groups, over one-fourth disagreed/strongly disagreed, while
11.4 percent of the First Course group disagreed/strongly disagreed. Large majorities
(between 88.1 percent and 96.4 percent) in all groups ranked the item in the lower end of
the scale. This includes over 50.0 percent in each group who ranked the item number 11
(least helpful).

For lesson outlines, large majorities in all groups agreed/strongly agreed that the
factor was helpful. On the rank-order scale, each group is fairly evenly divided and no
majorities are found at either end of the scale, where percentages range from 36.9 to 49.9
percent.

Concerning written objectives, majorities in all groups agreed/strongly agreed that
the factor was helpful. Few disagreed, but considerable percentages were neutral. On the
rank-order scale, each group is fairly evenly divided and no majorities are found at either
end of the scale, where percentages range from 32.2 to 47.8 percent.

For the amount of information presented before a study question is asked, large
majorities in each group, ranging from 84.7 percent to 89.8 percent, agreed/strongly
agreed that the factor was helpful. Majorities in all groups ranked the item in the upper
end of the scale. Slightly over 25.0 percent in each group also ranked the item in the
lower end of the scale.

Concerning typographical features, majorities in all groups agreed/strongly agreed
that the factor was helpful. Few disagreed, but considerable percentages (between 20.4
percent and 38.6 percent) in all groups were neutral. Majorities in all groups ranked the
item in the lower end of the scale.
For graphic art, majorities in all groups, ranging from 70.5 percent to 75.5 percent, agreed/strongly agreed that the factor was helpful. Few disagreed, but considerable percentages, ranging from 17.5 percent to 27.3 percent, were neutral. Majorities in all groups, ranging from 71.4 percent to 80.4 percent, ranked the item in the lower end of the scale.

Concerning study questions, over 90.0 percent in each group agreed/strongly agreed that the factor was helpful. Large majorities in each group, ranging from 84.8 percent to 91.3 percent, ranked the item in the upper end of the scale.

For answers to study questions, roughly 90.0 percent in each group agreed/strongly agreed that the factor was helpful. At least two-thirds in all groups ranked the item in the upper end of the scale. Between 16.2 percent and 23.9 percent also ranked the item in the lower end of the scale.

Concerning self-tests, majorities in over 90.0 percent in each group agreed/strongly agreed that the factor was helpful. At least two-thirds in all groups ranked the item in the upper end of the scale.

For UPE’s, majorities in all groups agreed/strongly agreed that the factor was helpful. Majorities in the two more experienced groups ranked the item in the upper end of the scale while the First Course group was evenly divided, with less than 50.0 percent in both upper and lower ends.

What is the difference of perceptions of the facilitative nature of instructional development factors between groups who are currently studying and groups who are not? For lesson openers, majorities in both groups agreed/strongly agreed that the factor was
helpful. Few disagreed, but sizeable percentages were neutral (Current group, 16.5 percent; Last 12 Months group, 28.6 percent). In the rank order scale, majorities in both groups ranked the item in the lower end of the scale, with roughly one-third of each group also ranking the item in the upper end of the scale.

Concerning lesson artwork, the majority of the Current group (57.8 percent) were neutral, nearly one-fourth agreed/strongly agreed that the factor was helpful, and 17.9 percent disagreed/strongly disagreed. For the Last 12 Months group, one-third were neutral, roughly one-fourth agreed/strongly agreed, and 42.9 percent disagreed/strongly disagreed. On the rank-order scale, over 90.0 percent in both groups ranked the item in the lower end of the scale.

For lesson outlines, majorities in both groups agreed/strongly agreed that the factor was helpful. Few disagreed, but 23.8 percent of the Last 12 Months group were neutral. On the rank order scale, both groups were fairly evenly divided between upper and lower end rankings, with less than 50.0 percent in each end of the scale.

Concerning written objectives, majorities in both groups agreed/strongly agreed that the factor was helpful. Few disagreed, but considerable percentages were neutral. On the rank-order scale, both groups were divided between upper and lower end rankings, with less than 50.0 percent in either end of the scale.

For the amount of information presented before a study question is asked, over 80.0 percent in both groups agreed/strongly agreed that the factor was helpful. On the rank-order scale, majorities in both groups ranked the item in the upper end and over 20.0 percent in the lower end.
Concerning typographical features, 71.7 percent of the Current group agreed/strongly agreed that the factor was helpful, while 47.6 percent of the Last 12 Months group agreed/strongly agreed. Considerable percentages (26.0 and 33.3 respectively) were neutral, and 19.1 percent of the Last 12 Months group disagreed/strongly disagreed. On the rank-order scale, large majorities in both groups ranked the item in the lower end of the scale.

For graphic art, majorities in both groups agreed/strongly agreed that the factor was helpful. Roughly 25.0 percent in both groups were neutral. On the rank-order scale, large majorities (more than 75.0 percent) ranked the item at the lower end of the scale.

Concerning study questions, at least 90.0 percent in both groups agreed/strongly agreed that the factor was helpful. On the rank-order scale, large majorities in both groups ranked the item in the upper end of the scale.

For answers to study questions, large majorities in both groups agreed/strongly agreed that the factor was helpful. On the rank-order scale, over 70.0 percent in both groups ranked the item in the upper end of the scale.

Concerning self-tests, over 90.0 percent in both groups agreed/strongly agreed that the factor was helpful. On the rank-order scale, large majorities ranked the item in the upper end of the scale.

For UPE’s, over 85.0 percent in both agreed/strongly agreed that the factor was helpful. On the rank-order scale, majorities in both groups ranked the item in the upper end of the scale and considerable percentages ranked it in the lower end.
The student comments (Part 4 of the instrument) show no particular trends. A number of comments mention the facilitative nature of self-tests and UPE’s, several mention the helpfulness of study questions and the ready access to their answers. Several comments recommend cutting down the length of information chunks in content presentation. A few mention deficiencies in artwork while others mention the helpfulness of the same.

Overall, the comments are positive, often suggesting ways to improve specific instructional development factors. Taken as a whole, the comments seem to agree with the general thrust of the Likert scale and rank-order scale data. No major departures appear.

Discussion

With the exception of the number of courses completed, the demographic data all represent significant departures from expected frequency distributions. Since this indicates that the distributions are not attributable to chance, they are probably best explained as distributions typical of an institution aligned with a conservative evangelical Protestant church denomination.

This would especially be true of the gender and ethnic background data. There were twice as many male students as female students in the Global University sample. The Assemblies of God, with which Global University is affiliated, is traditionally heavily male in leadership. Therefore, one would expect a large number of males in the student population, since males would be the most likely to study for ministry positions. The ethnic background data were heavily Caucasian (81.6 percent). This can be
considered an accurate reflection of the denomination population, which has been traditionally low in minority representation. The gender and ethnic data should raise warning flags for the institution, however, since females and ethnic minorities are either not being recruited, are less aware of the institution’s services than are males and Caucasians, or are not taking as much advantage of the institution’s services as are males and Caucasians.

The age group N’s were virtually equal with the exception of the 50 or Over group. A possible explanation for this is that younger people are studying for a still-future career in ministry-related areas and the middle-aged are seeking to improve ministry-related skills. Older people are coming to the end of a career and need no further job-related education. Those older people who study do so primarily for self-enrichment or to qualify for lay ministry positions in the church.

The course completion data showed very similar numbers of respondents per group. This may be a warning sign for the University, since it means that roughly the same numbers of students are beginning their studies as are further along in or nearing the end of their studies. Such signs of lack of growth should be of concern to any educational institution.

The data on recency of studies are perhaps a healthy sign for the institution, showing relatively few students who are not currently active in their studies. The instrument did not, however, ask non-currently studying respondents to identify the reason for the lapse in their studies.
According to the Likert scale data, the respondents perceived all instructional development factors except lesson art to be helpful. (In the Likert scale data for lesson art, roughly 50.0 percent in all groups chose the neutral option, with roughly 25.0 percent in both the agree/strongly agree and disagree/strongly disagree options. The difference between average agree/strongly agree percentage for lesson art and average agree/strongly agree percentage for the next highest ranked factor, typographical features, was nearly 45.0 percent.)

However, when asked to rank the 11 instructional development factors, a rather definite pattern emerged. Study questions were ranked number 1 (most helpful) by every group; self-tests and answers to study questions were overwhelmingly ranked number 2 and number 3 respectively. UPE’s and the amount of information presented before a study question is asked were ranked either number 4 or 5 by almost every group. Lesson outlines, written objectives, and lesson openers were ranked number 6, 7, and 8 respectively with few exceptions. Graphic art, typographical features, and lesson artwork were consistently ranked (in varying order) number 9, 10, and 11 by every group.

A closer examination of this pattern reveals several interesting features. The three factors receiving the highest ranks (study questions, self-tests, and answers to study questions) were all associated with formative evaluation. UPE’s, which are also formative in nature, were ranked either number 4 or 5 by all groups except one. This agrees with existing research on testing and measurement which emphasizes both the achievement of course objectives (Hegarty, Phelan, & Kilbride, 1998) and the assessment of educational quality (Popham, 1988). The instructional development factors that
received the highest rankings also relate to feedback and review. Reynolds and Glaser (1964) note that learning is related to repetition. The factors that received the highest rankings (study questions, self-tests, answers to study questions, and UPE’s), all provided repetitive practice for the students, preparing them for the final exam.

The amount of information presented before a study question is asked frequently switched places with UPE’s in the rankings by various groups. The amount of information factor was the highest ranked among those factors associated with content presentation and organization. The next 3 factors (lesson outlines, written objectives, and lesson openers), which were consistently ranked numbers 6, 7, and 8, also were associated with content organization and presentation, primarily as introductory or orientating factors. Respondents in this study seemed to agree with the research and opinions of Bååth (1976), El-Hmaisat (1989), Keller and Burkman (1993), and Smaldino (1998) who emphasize the facilitative nature of the presenting information in short blocks of text followed by feedback of some kind (often a question).

The remaining organizational factors (lesson outlines, written objectives, and lesson openers) classify as introductory or orientating factors (Ausubel, 1960, 1963; Wright & Conroy, 1988; Misanchuk, 1994). Their purpose is to prepare the student to encounter the material to be taught. The research, particularly on Ausubel’s advance organizers, points to a facilitative effect, albeit small, on learning (Mayer, 1979; Luiten, Ames, & Ackerson, 1980). Perhaps this explains why these factors were ranked, as a group, as relatively low on the scale as they were.
The three factors receiving the lowest ranks (graphic art, typographical features, and lesson artwork) were all associated with the visual enhancement of text and ideas. These three factors were ranked in the last three positions by every group, without exception, indicating they were the least helpful of all the factors. The guiding principles that emerge from existing research show that, to be effective, typographical design must enhance the learning process and motivate the learner (Marland & Store, 1982; Andrewartha, 1996). Similarly, research on graphic art shows that, to be effective, art must present information in a visual form, thereby increasing comprehension or serving as a mnemonic aid (Duchastel, 1981; Smaldino, 1998).

Male and female respondents showed very similar perceptions of the facilitative nature of the instructional development factors. Both gender groups ranked the factors in the same order except for exchanging places between UPE’s and the amount of information presented. Percentages for all factors were fairly close between the two gender groups.

Age-group comparisons yielded no clear trends. All four groups ranked study questions, self tests, and answers to self tests number 1, 2, and 3 respectively. All four groups also ranked graphic art, typographical features, and lesson artwork number 9, 10, and 11 respectively. But the age groups differed on rankings of the remaining factors. A larger percentage of the oldest group (50 or over) ranked self tests higher than any other age group but ranked UPE’s the lowest of all age groups. Less than 50.0 percent in either of the two older groups ranked UPE’s in the upper end of the rank-order scale, while over 60.0 percent in both of the two younger groups ranked UPE’s in the upper end of the rank
order scale. At the same time, larger percentages in the two older groups ranked lesson outlines, written objectives, and lesson openers higher than did the two younger groups. This seems to suggest that older students focus more on content organization and less on course grade.

With such a heavy Caucasian population and so few respondents in other ethnic groups, comparisons among and between groups were practically impossible. A comparison of the data from Caucasians and Hispanics, the two groups with the largest numbers of respondents, reveal very similar perceptions of the facilitative nature of the instructional development factors. Rank order and percentages were nearly identical with one notable exception: Caucasians ranked lesson openers considerably lower than did Hispanics. Do Hispanics focus more on advance organizers than do Caucasians?

Students enrolled in their first course ranked self-tests and UPE’s considerably lower than their more experienced counterparts. This may be due to unfamiliarity with the formative evaluation sequence used in Global University’s instructional development program. Since students enrolled in their first course had not yet taken their first final exam, they would have no basis on which to judge the facilitative nature of the formative evaluation factors.

At the same time, students enrolled in their first course perceived the amount of information presented before a study question is asked to be much more helpful than did their more experienced counterparts. This may mean that new students focus more on content than on evaluation and final grade.
The two groups in the recency of study category show very similar perceptions of the facilitative nature of the instructional development factors. Both recency groups ranked the factors in the same order except for two instances: an exchange of places between UPE’s and the amount of information presented, and an exchange of places between written objectives and lesson openers. Percentages for all factors were fairly close between the two recency of studies groups.

Conclusions

1. The pattern that emerges from the data seems to indicate that Global University students perceive the formative evaluation factors to be the most helpful in course success, probably because these are factors designed to prepare the student for the final examination in each course. The final examination grade, in Global University’s program, counts for 80 percent of the course final grade. The pattern also seems to indicate that the way the content is organized and presented is perceived to be the next most helpful in course success, secondary to evaluation factors, and that the visual enhancement factors (artwork and typographical features) are the least helpful of all. Several possible explanations suggest themselves. Are Global University students not highly visually oriented in their learning patterns? Are the institution’s visual enhancement factors such as artwork not functioning in the way they were envisioned? Do the institution’s students prefer to focus on the text and not on visual aids?

2. Males and females perceive the facilitative nature of Global University instructional development factors in similar ways.
3. All age groups perceive the facilitative nature of study questions, self tests, and answers to study questions similarly. They also perceive the facilitative nature of graphic art, typographical features, and lesson artwork in similar ways. However, there is some disagreement among age groups concerning the facilitative nature of UPE’s and all 4 of the content organization and presentation factors. Older students seem to focus more on organization; younger students seem to be slightly more balanced between a focus on content and on testing.

4. Caucasians and Hispanics perceive the facilitative nature of instructional development factors in similar ways, with the exception that Caucasians perceive lesson openers considerably less helpful than do Hispanics.

5. New students (those enrolled in their first course) perceive self-tests and UPE’s to be less helpful than do students who have completed 1 or more courses. New students perceive the amount of information presented before a study question is asked to be more helpful than do students who have completed 1 or more courses.

6. Students who are currently studying and those who are not currently studying but have studied within the past 12 months perceive the facilitative nature of the instructional development factors in very similar ways.

Recommendations

Distance education is a fact and trend in academe. Hence, enrolment in distance education programs is increasing and will continue to grow in the future. For such programs to provide the best possible education through their printed materials, there is a
need for further research on instructional development factors and their function and use in distance education courses. There is also the need for practical application of the results of such research.

1. This study concerned print-based distance education. Additional studies, particularly replications of the current study among similar institutions using similar instructional development programs, are needed to confirm and probe deeper the associations between instructional development features and success in distance education printed courses.

2. Global University should conduct on-going research into its student population’s perception of the facilitative nature of instructional development factors. This would build a larger database for continued comparison, particularly among those demographic groups whose minimal representation in this study made data analysis and interpretation difficult or impossible.

3. Global University should add to its existing exit survey items regarding student perceptions of the facilitative nature of the institution’s instructional development factors. This would add to the database the perceptions of students who have completed entire programs with the institution. These perceptions could then be compared with the data from the current study.

4. Global University should replicate the current study with non-American students. This may be done by continent, region, or country. Comparisons could be made with the data on American students gathered in the current study.
5. Global University should re-evaluate its use of graphic art. The low perception of the facilitative nature of graphic art by the respondents in this study suggests that the graphic art factor is not functioning as it should according to current research. Institutional policies regarding the use and development of graphic art should be reviewed and revised as necessary to reflect current research on the effectiveness of graphic art.

6. Global University should re-evaluate the concept behind its use of lesson artwork. The stated purpose of Global University lesson artwork is to introduce the theme of the lesson in graphic form. Due to the consistent extremely low perception of the facilitative nature of this factor, Global University should determine whether such artwork should be scrapped, redesigned, or replaced with something more facilitative.

7. Global University should re-evaluate its typographical design without interfering with established content presentation patterns. Typographical features such as margins and typeface should be examined to determine whether these can be altered to become more helpful to students.

8. Global University should include an introductory note in student packets explaining the facilitative nature of the institution’s formative evaluation factors. This should be written particularly with the first-course student in mind. The note should explain the relationship between the formative evaluation factors and the final examination.

9. Global University should consider marketing strategies specifically designed to attract females and non-Caucasian ethnic groups. Such marketing strategies could
emphasize the opportunities open to females in church ministry and the need for trained personnel in ethnic churches in the United States. These strategies could also emphasize study for personal enrichment for females and ethnic groups. Such strategies might also emphasize the practical nature of distance studies, such as the flexibility of home study.

10. Global University should develop marketing strategies for older students, particularly those 50 years of age and older. Such studies could underplay the degree plans and emphasize the personal enrichment factor found in home study and the usefulness of such studies in lay ministry in the local church.

11. Global University should develop marketing strategies designed to increase new student enrolment. Targeting females, ethnic minorities, and older students would help increase new student enrolment. However, cultivating further enrolments among already well-represented groups is necessary for continued institutional health.

12. In all future marketing and publicity, Global University should emphasize the positive results of this study. This includes the presentation of information in manageable chunks and the facilitative nature of the formative evaluation factors employed.

13. Curriculum developers, particularly the deans of the various schools within the institution, should consider the strengths and weaknesses pointed out by the current study in the planning of future courses. Perhaps specific courses could be written which take advantage of the best practices of instructional development as pointed out by this study, and avoid or downplay those factors perceived to be least helpful. Conversely, it may be that certain courses lend themselves to certain instructional development factors better than others.
14. Training for Global University’s course writers and instructional development specialists should be broadened to include a review of the results of this study and a consideration of its implications. These people, particularly instructional development specialists, should be included in the re-evaluations recommended and the implementation of alternatives in certain factors.

15. New courses implementing changes recommended by this study should be pilot-tested and field-tested before full publication. The instrument used in this study could be used to gather data from pilot and field tests. These data should then be compared and contrasted with the results of the current study. Similarities and differences in student perceptions should be noted and further adjustments in the instructional development package could then be made.

16. Students should be made aware of the facilitative nature of each instructional development factor. A section of the course introduction could address this. If this is explained in advance, students might make better use of each factor.
APPENDIX A

INITIAL COVER LETTER TO SAMPLE
August 21, 2000

[mail merge name]
[mail merge address1]
[mail merge address2]

Dear [mail merge name],

Global University is appealing to you for help. We are not asking for funds – we only ask a few minutes of your time.

It is to your advantage to be recognized as a graduate of an institution with an excellent reputation. In the world of distance education, there are good programs and there are bad programs. Global University already has a great reputation, but we want to make our courses even better. *You can help us by cooperating in a study* being carried out by the University’s School of Education in cooperation with the Office of Research and Evaluation and in conjunction with the University of North Texas.

*We want your opinion of our undergraduate courses through a brief survey.* We are interested in your responses because of your experience with Global University courses. Your answers will contribute to our evaluation of the instructional development used in our courses. By instructional development, we mean the various things we do to teach a course. This includes items such as the lesson openers, the list of lesson objectives, key words, study questions, even the kind of type we use. The results of this study will help develop better study guides for the future.

*The survey accompanies this letter. It should take only about 15 minutes to fill out.* Your responses will remain completely confidential. We will appreciate it if you would complete the enclosed survey prior to October 15, 2000 and return it in the stamped, self-addressed envelope enclosed. Do not put your name on the survey or the envelope.

As a participant in a formal study, we ask you to read and sign the enclosed Research Consent Form and return it with the completed questionnaire in the enclosed envelope.

As a way of saying thanks for your participation, we will be glad to send you a summary of the survey results if you desire. Please indicate by checking the “Yes” box on the Research Consent Form. Again, thank you for your cooperation.

Sincerely yours,

Jack Nill
Dean, School of Education
Student Questionnaire
Global University Instructional Development

Respondent identification number: __________________

Part 1: Demographic Data

Instructions: Blacken the box in front of the answer that applies to you.

1. What is your gender?
   ρ A. MALE
   ρ B. FEMALE

2. What is your age?
   ρ A. UNDER 30
   ρ B. 30 - 39
   ρ C. 40 - 49
   ρ D. 50 OR OVER

3. What is your ethnic background?
   ρ A. AMERICAN INDIAN
   ρ B. CAUCASIAN
   ρ C. ASIAN
   ρ D. BLACK
   ρ E. HISPANIC
   ρ F. OTHER (PLEASE IDENTIFY)_____________________________

4. What is the total number of Global University courses (including Berean or ICI courses) you have completed to date?
   ρ A. 5 OR MORE
   ρ B. 1 - 4
   ρ C. I AM CURRENTLY ENROLLED IN MY FIRST COURSE

5. When was the last time you studied with Global University (including Berean or ICI)?
   ρ A. CURRENTLY STUDYING AT LEAST ONE COURSE
   ρ B. WITHIN THE PAST 12 MONTHS
   ρ C. OVER A YEAR AGO
Student Questionnaire

Part 2 - Evaluation of Global University Instructional Development Factors

Instructions: Read each statement numbered 6 through 16 and decide on your level of agreement or disagreement with the statement. Mark a check in the appropriate box. You may refer to a Study Guide to refresh your memory on what each factor is.

<table>
<thead>
<tr>
<th>#</th>
<th>Factor and explanation</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral (neither agree nor disagree)</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Lesson Openers (introductions to the lesson) helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>The artwork at the beginning of each lesson helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Lesson Outlines helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Written Objectives (Lesson Objectives and Margin Objectives) helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>The amount of information presented before a study question is asked helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>The differences in type (capital letters, boldface, italics, etc.) helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Graphic art (charts, graphs, maps, tables, etc.) helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>The Study Questions in each lesson helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>The Answers to the Study Questions at the end of each lesson helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>The self-tests at the end of each lesson helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>The UPE’s at the end of each unit helped me succeed in the courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Part 3 - Ranking of Global University Instructional Development Factors

Instructions: Rank the eleven factors in the following list in order of their helpfulness to you in your successful completion of Global University courses. In the column marked “Ranking Order,” mark a 1 in front of the factor that was most helpful to you in your courses, a 2 in front of the factor you feel was the second most helpful, and so on. The factor you feel was least helpful would be marked 10. Use each number only once, and be sure to rank each factor. You may refer to a Study Guide to identify the factors.

<table>
<thead>
<tr>
<th>Ranking Order</th>
<th>Factor Description</th>
<th>Question Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Lesson Openers (introductions to the lessons)</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Lesson Artwork at the beginning of the lessons</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Lesson Outlines</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Written Objectives (Lesson Objectives and Margin Objectives)</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>The amount of information presented before a study question is asked</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>The differences in type (capital letters, boldface, italics, etc.)</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Graphic Art (charts, graphs, maps, tables, etc.)</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>The Study Questions in each lesson</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>The answers to the Study Questions</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>The Self-Tests at the end of each lesson</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>The Unit Progress Evaluations (UPE's) at the end of each unit</td>
<td></td>
</tr>
</tbody>
</table>
Student Questionnaire

Part 4 - Additional comments.

Please make any additional comments concerning the instructional development of Global University courses. If you want to add a comment on a specific question in Part 2 or Part 3 of the Questionnaire, please refer to that question by number.
APPENDIX C

COVER LETTER FOR FOLLOW-UP MAILINGS
October 24, 2000

[mail merge name]
[mail merge address1]
[mail merge address2]

Dear [mail merge name],

Everyone is busy these days, and most of us are busier than we’d like to be. It’s hard enough keeping up with those responsibilities that are essential without giving consideration to extra items that ask for our attention.

A few weeks ago we sent you a questionnaire. I hope it arrived. We’ve had no reply from you yet. Perhaps you misplaced it, or it may be that it got lost in the mail. Any one of a dozen things may have happened to it.

We are enclosing another copy of the questionnaire. Please try to find about fifteen minutes somewhere in your schedule to check the items and return it to us in the self-addressed stamped envelope enclosed. Most of the other questionnaires have already been returned. We’d like to get them all back. Will you help us?

Thanks. We appreciate your kind consideration.

Very sincerely yours,

John (Jack) Nill
Dean, School of Education

PS: If you’ve already mailed the questionnaire to us, please disregard this letter.
APPENDIX D

UNIVERSITY OF NORTH TEXAS

COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS

RESEARCH CONSENT FORM
Subject Name:________________________________________  Date:_____________________

Title of Study: Distance-Mediated Higher Education: The Association Between Instructional Development Factors and Successful Course Completion

Principal Investigator: John G. Nill

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the proposed procedures. It describes the procedures, benefits, risks, and discomforts of the study. It also describes the alternative treatments that are available to you and your right to withdraw from the study at any time. It is important for you to understand that no guarantees or assurances can be made as to the results of this study.

Purpose and duration of the study: The study asks students to assess the instructional development used in Global University correspondence courses in order to ascertain associations between instructional development factors and success in distance education. The study will last 3 months. Each participant will only need to answer a four-part questionnaire consisting of 27 questions and make any qualitative comments.

Description and procedures of the study: I am studying the factors that distance education students feel are most helpful in successful course completion. A random sample was drawn from a list of students currently studying with Global University. A questionnaire was mailed to each sample member. A self-addressed stamped return envelope is included. A number is assigned to each name, and these will be checked off as questionnaires are returned. Names and envelopes will be discarded, and the database will only include participant numbers, thus safeguarding confidentiality of identity and responses. Chi-square tests will be conducted on the numerical data.

Description of procedures/elements that may result in discomfort or inconvenience: No physical risk exists, since the study involves completing a survey. Psychological and/or social risks are held to a minimum since anonymity is assured.

Description of procedures/elements that are associated with foreseeable risks: None.

Benefits to subjects: Participants will have the satisfaction of helping Global University improve its instructional development package used in correspondence studies. This will improve the reputation of the university, and it is to the advantage of every student to matriculate at or graduate from a reputable institution. In addition, the results of this study may help distance educators everywhere improve the quality of their materials.

Confidentiality of research records: Participant names will correspond with numbers. These will be checked off on a return questionnaire list. On the database, no names will appear: only numbers will be used. Thus anonymity of name will be secured, simultaneously assuring
confidentiality of responses. Research records will be under the purview of the principal investigator at all times.
UNIVERSITY OF NORTH TEXAS
COMMITTEE FOR THE PROTECTION OF HUMAN SUBJECTS
RESEARCH CONSENT FORM
Page 2 of 2

REVIEW FOR PROTECTION OF PARTICIPANTS:
This research study has been reviewed and approved by the UNT Committee for the Protection of Human Subjects (940-565-3940).

RESEARCH SUBJECTS’ RIGHTS: I have read or have had read to me all of the above.
_________________________ has explained the study to me and answered all of my questions. I have been told the risks or discomforts and possible benefits of the study. I have been told of other choices of treatment available to me.

I understand that I do not have to take part in this study, and my refusal to participate will involve no penalty or loss of rights to which I am entitled. I may withdraw at any time without penalty or loss of benefits to which I am entitled. The study personnel can stop my participation at any time if it appears to be harmful to me, if I fail to follow directions for participation in the study, if it is discovered that I do not meet the study requirements, or if the study is canceled.

In case there are problems or questions, I can call Jack Nill at 417-862-9533, extension 2309.

I understand my rights as a research subject, and I voluntarily consent to participate in this study.
I understand what the study is about and how and why it is being done. I will receive a signed copy of this consent form.

______________________________________  _________________________
Subject’s signature     Date

______________________________________  _________________________
Signature of Witness     Date

☐ Yes, I would like to receive a copy of the survey results.
☐ No, I do not want to receive a copy of the survey results.

For the Investigator:
I certify that I have reviewed the contents of this form with the person signing above, who, in my opinion, understood the explanation. I have explained the known benefits and risks of the research.

______________________________________  _________________________
Principal Investigator’s Signature     Date
REFERENCES


