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PERCEPTIONS OF THE EFFECTIVENESS OF ONLINE INSTRUCTION IN TERMS OF THE SEVEN PRINCIPLES OF EFFECTIVE UNDERGRADUATE EDUCATION

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ABSTRACT

This study investigated the perceived effectiveness of online instructional delivery among full-faculty experienced teaching online as well as in traditional classroom environments and variables of instructional experience, rank, academic field, online instructional experience, and course level as they related to Chickering and Gamson's Seven Principles of Effective Undergraduate Education. These principles assert that good instructional practice encourages student-faculty contact, encourages cooperation among students, encourages active learning, gives prompt feedback, emphasizes time on task, communicates high expectations, and respects diverse talents and ways of learning. Respondents rated online instruction as slightly more effective overall and also more effective for promoting prompt feedback, time on task, respect for diverse learning styles, and communicating high expectations, but was rated less effective for promoting student-faculty contact and cooperation among students. Perceived effectiveness was higher for experienced faculty and increased with the number of online courses taught and with course level of the online class. Academic field had a more limited influence.

INTRODUCTION

Colleges and universities have embraced the Internet and the World Wide Web as a platform for delivering instruction. While the expanding role of information technologies in higher education make it possible for institutions to reach new students and increase learning opportunities through online and network-based

learning, teaching online may also be perceived as a threat to the traditions of higher learning [1, 2]. Many advocates of online learning suggest that, at the very least, faculty must rethink their traditional classroom instructional models in order to teach effectively online [3]. Studies have also suggested that faculty perceive the use of a computer-based asynchronous teaching model as very different from traditional teaching models [4]. Anderson [5] stated that "it is not enough to simply take a traditional course and attempt to convert the content to a different delivery mechanism" [p. 383], and referred to such an approach as an "academically impoverished but technologically advanced enterprise" [p. 383].

Some proponents have identified specific activities associated with online communication as having distinct advantages over traditional instruction by obscuring cues to social and organizational hierarchy [6], and others have suggested that online instruction can enhance student–student collaboration [7]. However, evaluation of the effectiveness of online instruction has been limited and "much is unknown about online instruction as a delivery paradigm" [8].

The effectiveness of online instruction must also be considered in the context of research, suggesting that effective teaching and learning involves a wider range of experiences beyond the dissemination of course material by the instructor. For example, Pascarella and Terenzini identified several studies that point to the impact of type and frequency of interactions among students as well as between faculty and students on factors ranging from educational attainment to selection of academic major [9]. Their own research found that "the frequency of non-class contact with faculty to discuss intellectual matters had a statistically significant positive association with reported gains in intellectual development." Astin proposed that learning is directly related to student involvement in the overall academic experience [10]. He stated that "student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience." Therefore, assessment of effective online instruction must consider the broader context in which teaching and learning takes place.

One tool used to assess effective instructional practices that addresses this broader context is the Faculty Inventory. The Faculty Inventory is a survey based upon the Seven Principles of Good Practice in undergraduate education developed by Chickering, Gamson, and Barsi [11]. This instrument has gained widespread acceptance in colleges and universities as a tool for identifying effective instructional practices. First published in 1987 by the American Association of Higher Education, the seven principles "clarify what an outstanding faculty member would consistently do" [12]. The seven principles assert that good instructional practice: a) encourages student-faculty contact; b) encourages cooperation among students; c) encourages active learning; d) gives prompt feedback; e) emphasizes time on task; f) communicates high expectations; and g) respects diverse talents and ways of learning. The Faculty Inventory survey based on these principles was developed as a formative self-assessment tool intended

to assist faculty in improving instructional practices. Chickering and Reisser stated that "the principles of good teaching are well known" and added that "effective practices have been documented in numerous research and evaluation projects" [12, p. 369].

However, when these principles were initially proposed, college courses were delivered almost exclusively in a traditional face-to-face classroom. Chickering and Ehrmann stated that "since the principles were first proposed in 1987, new technologies have become a major resource for teaching and learning in higher education" [13, p. 3]. Therefore, if the Seven Principles of Good Practice in undergraduate education provide an indication of effective practices in undergraduate teaching, they should apply to any instructional delivery method. According to Chickering and Ehrmann, "if the power of the new technologies is to be realized, they should be employed in ways consistent with the seven principles" [13, p. 3]. This study sought to identify the perceived effectiveness of online instruction at meeting widely accepted educational goals outlined in the seven principles. Using the practices described in the seven principles as a framework, the study asked faculty from a variety of institutions and academic fields with experience teaching online to compare their perceptions of the effectiveness of online instruction to traditional classroom instruction. In addition to the overall perception of effectiveness, the study also investigated the relationship between the perceived effectiveness and the instructor's rank and instructional experience, academic field, online instructional experience, and academic level of instruction.

METHODOLOGY

This study investigated the following primary research question:

> Do faculty perceive online instructional delivery to be as effective as traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education?

The null hypothesis associated with this research question was as follows:

> Hϕ: Faculty perceive online instructional delivery to be as effective as traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education.

In order to consider the primary research question in the context of other characteristics that may influence faculty perceptions of the effectiveness of online instruction, the study included several subsidiary questions that investigated the relationship of these perceptions to academic rank and experience, academic field, the number of online courses a faculty person had taught, and the academic level of the classes a faculty person had taught. These questions and corresponding null hypothesis were as follows:

1. Does a faculty member's academic rank or level of teaching experience impact faculty perceptions of the effectiveness of online versus traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education?

Hϕ: There is no relationship between faculty perceptions of the effectiveness of online instructional delivery versus traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education based on rank or teaching experience.

2. Is there a relationship between the perceptions of faculty with experience teaching both as well as in a traditional classroom environment of the effectiveness of asynchronous online courses in meeting the educational objectives outlined in the seven principles of effective undergraduate education relative to their academic field?

Hϕ: There is no relationship between faculty perceptions of the effectiveness of online instructional delivery versus traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education based on academic field.

3. Does the number of courses previously taught online using asynchronous network technology impact faculty perceptions of the effectiveness of online versus traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education?

Hϕ: There is no relationship between faculty perceptions of the effectiveness of online instructional delivery versus traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education based on the number of courses previously taught using asynchronous network technology.

4. Does the course level of a class taught using online asynchronous network technologies impact faculty perceptions of the effectiveness of online instructional delivery versus traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education?

Hϕ: There is no relationship between faculty perceptions of the effectiveness of online instructional delivery versus traditional face-to-face instruction in meeting the instructional objectives outlined in the seven principles of effective undergraduate education based on course level.

The Study Population

The institutions from which the survey population was drawn included both two-year institutions and four-year colleges and universities. Additionally, the study was restricted to public and nonprofit private institutions in the United States. Both the institutions included in the study and the faculty members surveyed for this study were "purposively" selected [14], since a clearly identifiable cohort of full-time faculty using asynchronous network technologies

was not available. Internet searches were used to identify colleges and universities with extensive online course offerings. The primary method used to identify institutions was researching course offerings at colleges and universities listed with distance education consortiums. These consortiums included nonprofit organizations established to operate as collective information and marketing tools for distance education courses offered by member institutions as well as two for-profit consortiums.

The courses that were included in the study were limited to courses that were offered for college credit which were delivered using online network technologies involving no face-to-face meetings other than an initial meeting or proctored exams. Class listings were screened and cross-referenced in order to exclude noncredit courses and mixed delivery courses that used online instruction as an adjunct to traditional classroom instruction. The faculty surveyed at the selected institutions included all members that met the following profile:

1. They were full-time faculty or instructors at an accredited public or private college or university meeting the definition of extended traditional university. For-profit institutions were not included in the study.
2. They had taught at least one class using fully asynchronous networking or online technologies with no scheduled face-to-face class sessions other than an initial class meeting and/or proctored exams.
3. The online course was offered for college credit that could be applied toward meeting the requirements of a degree from an accredited institution.

Class listings at each institution were screened to eliminate instructors who were specifically identified as part-time or adjunct faculty. Additionally, administrators such as department chairs and learning technology support administrators at the selected institutions were contacted to assist with the identification of faculty and courses appropriate for this study. At the institutions from which the study population was drawn, all faculty who were identified as teaching an online or Internet course meeting the study profile were sent a survey form. Of the 71 institutions included in the study, 14 were two-year institutions and 57 were universities or four-year colleges. Of these, 61 were public institutions and 10 were private institutions.

The Survey Instrument

The survey instrument used was based upon the Faculty Inventory, the formative assessment tool that had been developed to assist faculty in determining if their instructional practices were aligned with the Seven Principles. As in the Faculty Inventory, the survey that was pilot tested used 10 5-point Likert-scale questions in order to evaluate practices relative to each of the seven principles, for a total of 70 questions. However, after initial development, a pilot test was conducted with faculty who met the study profile at a large mid-western public

university and at two community colleges. Based upon the responses to the pilot test, several revisions were made to the instrument. Three questions in the first category were identified as addressing non-classroom or instructionally-related practices and were removed. However, the remaining 67 items were retained in the final version of the instrument used in the study (see Appendix 1).

The survey instrument consisted of two sections. The first section of the questionnaire was designed to gather the following data which were used in the statistical analysis in order to address the research questions:

Question A. Academic rank.
Question B. Years of teaching/instructional experience.
Question C. Academic or instructional area.
Question D. Number of online or asynchronous network-based classes taught.
Question E. Academic level of courses that had been taught.

Responses to Questions A and B were used to address the subsidiary research question relating to academic rank and experience (Subsidiary Research Question 1). The options provided for Question A were "full professor," "associate professor," "assistant professor," and "instructor/lecturer," and were based upon designations that are commonly used at colleges and universities. An "other" option was also provided. Responses to Question B were "less than two years" "two to five years," and "more than five years."

Question C was used to gather data to address the second subsidiary question regarding academic field (Subsidiary Research Question 2). Due to the varied nomenclature used among institutions in describing disciplines or fields of study, Question C asked respondents to write in their academic field rather than provide predetermined categories. Responses were placed into the following categories for analysis: Math and Sciences, Business, Engineering/Technology, Humanities and Social Sciences, Education, and Computer Studies. These designations represented common academic fields that were broad enough to encompass the expected range of disciplines and specializations among the faculty responding to the survey while allowing for an aggregation of responses for comparison purposes.

Responses to Question D were used to document the respondent's online teaching experience (Subsidiary Research Question 3). The options were "one," "two to five," and "more than five." Responses to Question E were used to address the influence of academic level of online courses (Subsidiary Research Question 4). Three categories were used for the responses to Question D. Respondents indicating experience with online courses only at the 100 and/or 200 level were grouped as "lower division only," and respondents reporting experience with online courses at the "300," "400," and/or "500 and above" levels were grouped as "upper division only." Faculty reporting experience teaching online courses in both groupings were classified as "upper and lower division." It was assumed that all faculty receiving the survey would have sufficient academic and

instructional experience to appropriately classify their courses should class numbering differ from these terms.

Question D was also used as a "validation" question designed to determine if the participant's experience with online instruction matched the definition used in this study. The question asked, "How many classes have you taught that involved no scheduled face-to-face classroom meetings other than one initial meeting or proctored exams?" A "none" response resulted in the data from that survey being excluded from the study.

The second section, based upon Chickering, Gamson, and Barsi's Faculty Inventory [11], consisted of 67 Likert-scale items. Items 1 through 67 utilized a 5-point Likert scale. Since the Faculty Inventory, the instrument on which the study survey was based, was to be used as a self-administered tool to assist faculty in assessing how often they practiced or incorporated instructional practices identified as effective, the questions from the original survey were reworded. For example, the Faculty Inventory respondents were asked how often they utilized an activity or instructional technique while the instrument used in this study asked respondents to evaluate the effectiveness of online instruction in facilitating the use of the activity or instructional technique relative to traditional classroom-based instruction. The options for each question were "considerably more effective," "more effective," "equally effective," "less effective," and "considerably less effective." As shown in Table 1, the response items were arranged on the survey according to the corresponding principles described in the seven principles of effective undergraduate education and the Faculty Inventory.

Survey Distribution

The instrument was distributed to the survey population electronically via e-mail as an attachment in MS Word form. This enabled respondents to view the file and respond to the questions by filling in predefined sections or placing an "X" in a box to indicate their response, but prevented them from editing the document itself. Once the survey was complete, the respondents were asked to save the file and return their completed survey via e-mail as an attachment. The electronic form was pilot tested on both Windows and Macintosh platforms before the instrument was sent to the faculty selected for the study. Faculty receiving the e-mailed survey were provided with an option to be sent a paper version of the survey and a postage-paid return envelope would be sent to them if requested. Responses were tracked and nonrespondents received follow-up e-mail requests. After a third follow-up e-mail, paper surveys were mailed to 211 faculty randomly selected from the remaining nonrespondents.

Data Analysis

The data collected were analyzed using SPSS software (Statistical Package for Social Science, version 8.0), and included both nominal (Questions A, C, E, F, and

Table 1. Categories and Associated Survey Response Items

Categories		Response items
P1	Student-faculty contact	1–7
P2	Promoting cooperation	8–17
P3	Promoting active learning	18–27
P4	Promoting prompt feedback	28–37
P5	Promoting time on task	38–47
P6	Communicating high expectations	48–57
P7	Promotion diversity in learning styles	58–67
Total	Overall rating of effectiveness	1–67

G) and ordinal (Questions B and D and Items 1 through 67) data. Descriptive statistics were used to summarize the responses and frequency tables and cross-tabulation were used to establish a profile of the study population.

The respondents' ratings of the effectiveness of online instruction on the 67 Likert-scale items were assigned a value of 1 through 5 in accordance with the responses. A value of 1 was given to responses rating an item as "considerably less effective" and a value of 5 was given to responses of "considerably more effective." "Equally effective" was given a value of 3. The possible values ranged from a low of 67 to a high of 335, and the mean of the responses to the 67 items was used to calculate a total rating (P-Total) for all the response items. This rating was interpreted as indicating the participants' overall perception of the effectiveness of online instruction. A "not applicable" option was not provided since assigning a value to this response could not have been meaningfully interpreted for purposes of statistical analysis. It was therefore anticipated that some respondents would intentionally leave some response-items blank. The SPSS 8.0 software excluded missing items when calculating the mean.

The items were then grouped into seven categories corresponding to each of the seven principles, identified as P1 through P7. As with the P-total variable, a value of 1 was given to responses rating an item as "considerably less effective" and a value of 5 was given to responses of "considerably more effective." The possible values for each principle ranged from a low of 10 to a high of 50 for P2 through P7. The three items eliminated from the original survey were in P1 (promoting student-faculty contact). Therefore, the possible values for this category ranged from a low of 7 to a high of 35. In order to determine that the data were normally distributed, SPSS 8.0 was used to produce histograms for the P-total variable and each of the seven categories (P1 through P7). The data were

analyzed graphically by comparing the distribution of the data shown on the histogram with a normally distributed curve produced by SPSS.

The mean of the values of the response items associated with each principle was used to calculate an overall rating for each category (P1 through P7). This rating was interpreted as indicating the participants' perceived effectiveness of online instructional delivery for each category relative to face-to-face instruction. This analysis assumed that a grouping of multiple responses to ordinal-scale questions would be used to establish a "trend" and therefore be treated as interval data in statistical analysis.

A single-sample *t*-test with a test value of 3.00 was used to analyze the mean for the total score (P-Total) and for the seven individual categories (P1 through P7). Since a score of 3 (equally effective) indicated that there was no perceived difference between online and traditional instructional formats, the total score (P-Total) and the categories were analyzed to determine if the means calculated from the survey data were significantly different from this test value. The confidence interval used for this analysis was .95 ($\alpha = .05$).

In order to address the subsidiary Research Questions, the analysis utilized both parametric and nonparametric tests. The symmetric lambda correlation coefficient was used to determine the strength of relationships between nominal and ordinal data ($\alpha = .05$). This test was used to determine the relationship between P-Total and the seven categories and rank (Question A), academic field (Question C), and course-level experience (Question E). Bivariate correlation was used to determine the strength of relationships between independent and dependent variables with ordinal data. The responses to "years of instructional experience" (Question B) and "the number of classes taught using asynchronous online technologies" (Question D) were analyzed using the total score (P-Total variable), and the seven categories (P1 through P7) were analyzed as dependent variables. Spearrnan's rho ($\alpha = .05$) was used for this analysis.

One-way analysis of variance ($\alpha = .05$) was used in order to determine if there was a significant between-group difference on any of the seven categories (P1 through P7) or the seven categories collectively (P-total) based on nominal and ordinal variables. Rejection of the null hypothesis (based upon the finding of statistically significant *F* ratios) was followed by post hoc multiple comparison tests. The Tukey's honestly significant difference test was used for this procedure. Additionally, crosstab analysis was used to investigate the distribution of demographics in order to further evaluate the results of the statistical tests used in this study.

Assumptions and Limitations of the Study

It was assumed that the respondents were familiar with the instructional practices and related terminology used in the inventory and this study and that their responses accurately reflected their assessment of the effectiveness of online

instruction in meeting the stated goals and objectives. Since the size of the target population could not be accurately estimated or the members of the target population consistently identified, this study did not attempt to utilize a random sample. Therefore, generalizations and conclusions drawn from the data analysis are applicable to the study cohort and cannot be considered to reflect practices of all faculty at any of the participating institutions. It was assumed that the responses to the validation question accurately reflected the definition of online instruction utilized in this study. Additionally, it was assumed that a response of 3 on the Likert-scale items was interpreted as equally effective and that the responses to the survey reflected this interpretation. However, it is also possible that there was an influence by the "Hawthorne Effect" [15], which assumes that responses to the survey items were influenced by participation in the study. In this case, the influence may arise from advocates or proponents of online instruction who may exhibit a tendency to respond with a bias in favor of online instruction. This may further limit generalizations and conclusions drawn in this study.

FINDINGS AND DISCUSSION

Responses were received from 69 of the 71 institutions and included both public and private colleges and universities. Of the initial 837 electronically distributed surveys, 65 (7.78%) were determined to be not applicable to the study based on respondents replying that they did not meet the specified profile. Similarly, respondents who answered "none" to Question D were also determined not to be applicable. This resulted in a total survey population of 772 yielding. Of the 218 usable responses, 177 (22.93%) were returned via e-mail attachment and 41 (5.31%) responded via fax or using paper forms mailed to them. The response rate was 28.23%.

Sixty-one (28%) classified themselves as full professors and 107 (49.1%) classified themselves as associate or assistant professors, indicating that among full-time faculty, senior faculty were well represented among those delivering courses online. This conclusion is also supported by crosstabulation between rank and the number of classes taught online, which found that 43% of full professors had taught more than five classes online and only 15% had taught only one class. These data indicate that online instruction is not limited to only newer or younger faculty. Interestingly, nearly one-half of the instructors/lecturers reported that they had more than five years of teaching experience as well. Therefore, as reported in Table 2, even the non-tenure track instructors responding to the survey sample were found to be experienced faculty.

As for both total instructional experience and online instructional experience, 154 respondents (70.6%) indicated that they had more than five years of full-time instructional experience. Only 17 (7.9%) reported instructional experience of less than two years. Eighty-three (38.1%) reported that they had taught more than five

Table 2. Rank * Experience Crosstabulation

	Experience		
Rank	Less than 2 years	2 to 5 years	Over 5 years
Full professor		1	58
Associate professor		5	51
Assistant professor	7	20	22
Instructor/lecturer	7	14	19
Other	3	3	4
Total	17	43	154

classes online, 95 (48.6%) reported that they had taught two to five classes online, and 40 (18.3%) reported that they had taught only one online course.

Of the 218 returned surveys, 210 respondents indicated their academic field. The highest number of responses was from faculty in fields classified as Humanities and Social Sciences. There were 81 responses in this category. The Math and Sciences, Education, and Business categories had 37, 34, and 28 respondents, respectively. The smallest category was Engineering/Technology with 9 (4.1%) respondents. The breakdown of the respondents by academic field is documented in Table 3. Crosstabulation with both rank and experience found that the more experienced faculty were to a large extent proportionally distributed across these fields.

Findings for Overall Effectiveness Rating

The data used for the analysis of the P-Total variable (items 1 through 67) were found to be normally distributed and therefore appropriate for one-sample *t*-tests. When responses to Items 1 through 67 were considered collectively, the one-sample *t*-test found the total mean (P-Total $M = 3.078$) differed significantly from the test value of 3 (equally effective), which indicates that these faculty perceived online instruction as somewhat more effective than traditional classroom instruction ($p = .049$). The number of responses to Items 1 through 67 ranged between 160 and 218. Three items (65, 42, and 66) had an n of 174, 173, and 160, respectively, which indicates that 20% or more of the respondents left these questions unanswered. The mean ratings for the 67 items ranged from a high of 3.714 (out of 5) for Item 54, which rated the effectiveness of online instruction for "encouraging students to write" ($n = 210$, $SD = .946$), to a low of 2.065 for Item 16, which rated the effectiveness of online instruction for

Table 3. Breakdown of Study Population by Academic Field

Academic field	Frequency	Percentage	Valid
Math & sciences	37	17.0	17.6
Business	28	12.8	13.3
Engineering/technology	9	4.1	4.3
Humanities/social sciences	81	37.2	38.6
Education	34	15.6	16.2
Computer studies	21	9.6	10.0
Total respondents	210	96.3	100.0
Missing	8	3.7	
Total	218	100.0	

"encouraging students to join at least one campus organization" (n = 199, SD =.859). Standard deviations ranged from a high of 1.302 on Item 4 (learning to identify your students by name; n = 217, M = 3.060) to a low of .715 on Item 63 (integrating knowledge about women or other under-represented populations in your class; n = 198, M = 3.035). Since a "not applicable" option was not provided, this wide disparity of responses was inferred to be the result of interpretation of relevance to online instruction of some of the response items. For instance, the lowest response items were "encouraging students to design their own majors when their interests do not align with the structure of standard programs and curriculum" (160 responses) and "utilizing mastery learning or learning contracts as instructional tools in my class" (174 responses).

Individual response items did evoke a wide range of effectiveness ratings between online and face-to-face practices. On the one hand, the items that rated online practices as less effective reflected the environmental differences that influence out-of-class practices between online and face-to-face instruction. For example, the item "encouraging students to join at least one campus organization" (Item 16) had the lowest mean score of 2.065, which clearly indicates the perception of faculty that online is less effective than face-to-face in this practice, while "arranging field trips, volunteer activities, or internships related to the course" (Item 26) had the next lowest mean score of 2.196. The item "providing opportunities to advise students in your class about career opportunities in their field of study" had a mean rating of 2.467. Each of these three items had a mean average less than 2.5, which can be interpreted as evoking on average more responses of less effective than equally effective.

Four items were rated above 3.5, which can be interpreted that these items were perceived on average to be more effective for on-line instruction. These four items included the following: "encouraging students to write" ($M = 3.714$); "structuring your course to include exercises and problems that give students immediate feedback" ($M = 3.548$); "including research or independent study in assignments" ($M = 3.537$); and "contacting students who miss scheduled course activities" ($M = 3.507$). This perception supports the position presented in the literature that online instruction is effective for promoting written communication skills and self-directed learning [16, 17] and for facilitating feedback to students [5, 18].

The data also indicate that perceptions among individual faculty of the effectiveness of online instruction varied widely, even among a study population consisting of faculty who are currently teaching online. For example, for 12 respondents the P-total rating using all 67 response items was 4.0 or higher, which clearly indicates that they believed online instruction was more effective than face-to-face instruction. However, for nine others the P-total rating was 2.0 or less, indicating a much more negative perception of the effectiveness of online teaching. The divergent responses indicate that there is a divide between those who embrace the medium and those who may prefer traditional student-faculty interaction.

The means of the seven individual categories (P1 through P7) were found to be either significantly higher or lower than the test value, with the exception of P3 (promoting active learning). Therefore, analysis of the seven categories (P1 through P7) proved to be more useful than the analysis of the total score since the influence of some categories were, in effect, canceled out by others and resulted in a more neutral score for P-Total (items 1 through 67). The mean for the individual categories (P1 through P7) ranged from 3.33 for P4 ($SD = .680$) to 2.775 ($SD = .051$) and are shown in Table 4. As with the P-Total scores, the data used for analysis of the seven categories were found to be normally distributed and therefore appropriate for one-sample *t*-tests. One-sample *t*-tests found significant differences from the test value of 3 (3 interpreted as equally effective) for six of the seven categories. Only the mean for P3 (promoting active learning) was not found to be significantly different from the test value. Analysis found that the mean scores of the study population for P1 (promoting student-faculty contact) and P2 (promoting cooperation) were significantly lower than the test value. In contrast, the mean scores for P5 (promoting time on task), P6 (communicating high expectations), and P7 (promoting respect for diverse learning styles) were significantly higher. As indicated in Table 4, P1 (promoting student-faculty contact), P4 (promoting prompt feedback), P5 (promoting time on task), and P6 (communicating high expectations) were significant beyond .000.

The analysis of the P-Total variable, interpreted as an indication of overall perception of effectiveness, yielded a mean rating for online instruction that was slightly higher than "equally effective." Although this difference was not pronounced, it was statistically significant. The analysis of the seven variables P1 through P7 found several of these variables to be statistically significant as well.

Table 4. Effectiveness Ratings for Response Items 1–67: One-Sample *t*-Tests

Categories		Mean	*t*	*df*	Sig. (2-tailed)
P1	Student-faculty contact	2.775	–4.466	217	.000**
P2	Promoting cooperation	2.832	–3.089	217	.002**
P3	Promoting active learning	2.989	–0.241	216	.810
P4	Promoting prompt feedback	3.333	7.220	216	.000**
P5	Promoting time on task	3.193	4.046	216	.000**
P6	Communicating high expectations	3.233	5.321	216	.000**
P7	Promoting diversity in learning	3.121	2.509	216	.013*
P-Total	Items 1–67	3.078	1.977	217	.049*

Note: Test value = 3; $\alpha = .05$.
*Indicates significance at .05. **Indicates significance at .01.

Therefore, it can be concluded that the faculty in this study perceived online instruction to be somewhat more effective at meeting the specified objectives overall, but that this effectiveness was clearly not consistent on all seven principles. Therefore, based on the finding of statistical significance for the P-total (all 67 items), the null hypothesis for the primary research question was rejected. However, the data lead to the conclusion that the study population believed that online instruction is less effective for promoting student-faculty interaction and cooperation among students and more effective for providing prompt feedback and communicating high expectations.

Findings for Rank and Experience

Crosstab analysis using symmetric lambda found no relationship between academic rank and P-Total or on any of the individual seven categories. Additionally, there were no significant between-group differences found for academic rank using a one-way analysis of variance. Similarly, bi-variate analysis using Spearman's rho found no relationship between years of instructional experience and P-Total or on any of the individual seven categories. Results of analysis of variance did not find significant between-group differences for instructional experience for either P-Total or any of the seven individual categories.

Analysis of overall instructional experience using one-sample *t*-tests was more conclusive. The results of these tests are presented in Table 5. Faculty with less than two years of teaching experience rated online instruction significantly higher

Table 5. Effectiveness Rating * Instructional Experience: One-Sample *t*-Tests

Effectiveness rating	Less than 2 years		2 to 5 years		More than 5 years	
	Signif. 2-tailed	Mean diff.	Signif. 2-tailed	Mean diff.	Signif. 2-tailed	Mean diff.
Promoting student-faculty contact	.633	–.088	.086	–.174	.000**	–.247
Promoting cooperation among students	.402	–.183	.094	–.173	.014*	–.169
Promoting active learning	.399	–.137	.189	.123	.507	–.036*
Promoting prompt feedback	.012*	.455	.027*	.220	.000**	.350
Promoting time on task	.347	.142	.167	.199	.000**	.191
Communicating high expectations	.439	.118	.010*	.264	.000**	.236
Promoting diversity in learning styles	.668	.056	.314	.090	.023**	.143
P-total	.658	.059	.293	.086	.115	.078

Note: Test value = 3; $\alpha = .05$.
*Indicates significance at .05. **Indicates significance at .01.

than the test value of 3 (equally effective) in only one category (P4, promoting prompt feedback; $p = .012$). Faculty with between two and five years of teaching experience rated online instruction significantly higher for both P4 (promoting prompt feedback; $p = .027$) and P6 (communicating high expectations; $p = .010$). However, faculty with more than five years of teaching experience rated online instruction significantly lower on P1 (student faculty contact; $p = .000$) and P2 (promoting cooperation; $p = .014$) and significantly higher for P4 (promoting prompt feedback; $p = .000$), P5 (promoting time on task; $p = .000$), P6 (communicating high expectations; $p = .000$), and P7 (promoting respect for diversity in learning styles; $p = .023$).

There were somewhat similar results found when *t*-tests were used to analyze the individual classifications for rank. The *t*-tests found that online instruction overall (P-total) was rated significantly higher by full professors ($p = .034$) and by those classifying their rank as "other" ($p = .022$). When considering the individual categories, *t*-tests found that online instruction was rated significantly lower for P1 (promoting student faculty contact) by assistant professors ($p = .006$), associate professors ($p = .038$), and full professors ($p = .032$). The ratings for P1 were not significantly different from the test value for the instructor or "other" categories.

Of the five rank categories, only assistant professors did not rate online instruction significantly higher for P1 through P7. Full professors rated online instruction significantly higher for P4 (promoting prompt feedback; $p = .000$), P5 (promoting time on task; $p = .000$), P6 (communicating high expectations; $p = .001$), and P7 (promoting respect for diversity in learning; $p = .007$). Associate professors rated online instruction significantly higher for P4 (promoting prompt feedback; $p = .000$), P5 (promoting time on task; $p = .026$), P6 (communicating high expectations; $p = .002$), and P7 (promoting respect for diversity in learning; $p = .007$). Both the instructor and "other" rank rated online instruction higher for P4, P6, and P7. Faculty identifying themselves as "other" also rated online instruction higher for P5 (promoting time on task; $p = .017$). These results are reported in Table 6.

The lack of significant correlation or between-group differences for these questions indicates that there is a limited relationship between academic rank and overall instructional experience and the perceived instructional effectiveness of online instructional delivery at meeting the objectives of the seven principles of effective undergraduate education. However, a large percentage of the faculty participating in this study reported experience of over five years (70.6%), which may have influenced the lack of findings for between-group differences relative to experience. It should be noted that even among respondents who indicated their rank as instructor or "other," nearly one-half also indicated that they had over five years of teaching experience. Therefore, since rank is associated with experience ($p = .000$ for responses to this study), the parallel between these characteristics is not surprising. Higher levels of experience may also contribute

Table 6. Effectiveness Rating * Academic Rank: One-Sample *t*-Tests

Effectiveness rating	Full professor		Associate professor		Assistant professor		Instructor		Other	
	Signif. 2-tailed	Mean diff.	Signif. 2-tailed	Mean diff.	Signif. 2-tailed	Mean diff.	Signif. 2-tailed	Mean diff.	Signif. 2-tailed	Mean diff.
Promoting student-faculty contact	0.032*	–0.208	0.038*	–0.196	0.006**	–0.344	0.113	–0.161	0.621	0.098
Promoting cooperation among students	0.092	–0.187	0.577	–0.056	0.100	–0.194	0.030*	–0.248	0.921	0.020
Promoting active learning	0.883	0.012	0.920	0.009	0.549	–0.065	0.928	–0.007	0.058	0.379
Promoting prompt feedback	0.000**	0.511	0.000**	0.328	0.093	0.200	0.001**	0.255	0.021*	0.477
Promoting time on task	0.000**	0.379	0.026*	0.186	0.547	0.087	0.296	0.080	0.017*	0.270
Communicating high expectations	0.001**	0.258	0.002**	0.287	0.127	0.172	0.014*	0.198	0.003**	0.490
Promoting diversity in learning styles	0.007**	0.315	0.339	0.078	0.758	0.031	0.747	0.026	0.011*	0.283
P-total	0.034*	0.158	0.145	0.107	0.956	–0.005	0.709	0.027	0.022*	0.297

Note: Test value = 3; α = .05.
*Indicates significance at .05. **Indicates significance at .01.

to greater consistency in instructional approaches and the applications of various instructional techniques as well as greater skill at discerning differences between instructional delivery formats.

As a result, this study concluded that experience has a limited influence on perceptions of effectiveness but that influence is attributed to greater instructional skill developed with experience. It also concluded that the association between rank and perceived effectiveness is a function of instructional experience that accompanies rank rather than rank in and of itself. Therefore, the data support the conclusion that there is a relationship between instructional experience and perceived effectiveness of online instruction in meeting the objectives of the seven principles and therefore support the rejection of the null hypothesis for subsidiary research question 2.

Findings for Academic Field

Results of analysis used to address Research Question 2 regarding the relationship between perceptions and academic field were mixed. Respondents in Math and Sciences were found to have the highest mean total score ($M = 3.148$, $SD = .431$) while responses by faculty in Engineering/Technology fields produced the lowest ($M = 2.717$, $SD = .757$). Crosstab analysis found no significant relationship between academic field for the total score (P-Total as dependent variable). However, tests on the individual categories, P1 through P7, found a significant correlation between academic field and P4, promoting prompt feedback (symmetric lambda, $p = .003$, $\alpha = .05$). Analysis of data for Question 3 using one-way analysis of variance ($\alpha = .05$) found significant differences between groups for P1 (promoting student faculty contact; $F = 2.436$, $p = .036$). Post hoc tests revealed differences between Education and Engineering/Technology ($F = .8296$, $\alpha = .05$). Significant between-group differences were also found for the number of classes taught for P1 (promoting student faculty contact; $F = 5.977$, $p = .003$), P3 (active learning; $F = 5.775$, $p = .004$), P6 (communicating high expectations; $F = 4.435$, $p = .013$), P7 (promoting respect for diverse learning styles; $F = 4.431$, $p = .013$), and P-Total ($F = 5.419$, $p = .005$). Post hoc tests revealed that the differences were also between the Education and Engineering/Technology disciplines for each category.

Results of the single-sample *t*-tests for the individual field categories of Math and Sciences, Business, Humanities and Social Sciences, Education, Engineering/Technology Studies, and Computer Studies are reported in Table 7, which shows the significance found for effectiveness ratings for the seven categories and the P-total. Math and Sciences was the only field in which the P-Total variable was rated significantly higher than the test value of 3.0 ($p = .045$). P1 (promoting student-faculty contact) was rated significantly lower by faculty in Math and Sciences ($p = .037$), Business ($p = .002$), Engineering/Technology ($p = .007$), and Humanities and Social Sciences ($p = .027$). P2 (promoting cooperation among

Table 7. Effectiveness Rating * Academic Field: One-Sample *t*-Tests

Academic field	P1	P2	P3	P4	P5	P6	P7	P-Total
Math and Science								
Sig. (2-tailed)	.037*	.291	.896	.000**	.028*	.000**	.027*	.045*
Mean difference	–.236	–.107	.012	.413	.332	.309	.237	.148
Business								
Sig. (2-tailed)	.002*	.023*	.419	.004*	.035*	.148	.935	.990
Mean difference	–.408	–.340	–.077	.367	.221	.140	–.008	.001
Engineering/Technology Studies								
Sig. (2-tailed)	.007*	.091	.153	.866	.555	.690	.718	.294
Mean difference	–.778	–.510	–.361	–.058	–.170	–.111	–.122	–.283
Humanities and Social Sciences								
Sig. (2-tailed)	.027*	.237	.457	.000**	.001*	.000**	.045*	.068
Mean difference	–.209	–.121	.065	.392	.269	.306	.187	.137
Education								
Sig. (2-tailed)	.636	.467	.211	.136	.345	.051	.367	.289
Mean difference	.052	–.088	.123	.169	.112	.242	.098	.101
Computer Studies								
Sig. (2-tailed)	.357	.913	.201	.025*	.680	.081	.563	.407
Mean difference	–.136	.019	–.136	.470	.049	.243	.073	.097

Note: $\alpha = .05$.
*Indicates significance at .05. **Indicates significance at .01.

students) was also rated lower by faculty in Business ($p = .023$). Online instruction was rated higher for P4 (promoting prompt feedback) by faculty in Math and Sciences ($p = .000$), Business ($p = .004$), Humanities and Social Sciences ($p = .001$), and Computer Studies ($p = .025$). Online instruction was rated higher for P5 (promoting time on task) by faculty in Math and Sciences (.028), Business ($p = .035$), and Humanities and Social Sciences ($p = .006$), and higher for both P6 (promoting high expectations) and P7 (promoting respect for diverse learning styles) by faculty in Math and Sciences (P6, $p = .000$; P7, $p = .027$) and Humanities and Social Sciences (P6, $p = .000$; P7, $p = .045$).

While the only significant between-group differences for academic field found with analysis of variance were between Engineering/Technology Studies and Education, it is interesting to note that although faculty in Engineering/Technology Studies rated online instruction significantly lower than the test value for only P1 (student-faculty contact; $p = .007$), this was the only academic field in which the mean scores for P-total as well as P1 through P7 were all lower than 3 (equally effective). It is possible that significantly lower differences were not found for P2 through P7 as well as P-total due to the relatively low n for Engineering/Technology Studies. It should also be noted that the means of none of the categories were significantly different than the test value for faculty in Education. Additionally, the only field in with a positive mean difference for P1 was Education. However, this difference was not statistically significant. These data suggest that even though significant differences appeared only between Education and Engineering/Technology Studies, faculty in Education may be more effective at promoting student-faculty contact in the online environment than faculty in the other fields defined in this study. Additionally, the course content of Engineering/Technology Studies or the preferred instructional techniques of faculty in that field are not perceived to be as well aligned with online instructional delivery as the other fields. Based on this analysis, the null hypothesis for Research Question 2 was rejected.

Although no significant correlation was found for the total rating (P-total), the data analysis did produce a significant correlation between academic field and P4 (promoting prompt feedback). This suggests that even though significant differences appeared only between Education and Engineering/Technology Studies, consideration of the mean ratings along with results of one-sample t-tests demonstrates that there were differences in how effective online instruction was perceived for the specified activities and objectives by the study population based on academic field. As noted previously, the influence of the number of respondents in each category on the results cannot be discounted. Therefore, even though the influence of academic field on the effectiveness ratings for the individual categories (P1 through P7) as well as P-total appears to be limited, the findings lead to the conclusion that there is a relationship between perceived effectiveness of online instruction and academic field. However, this conclusion must be interpreted with caution. The designations used for academic fields were

intentionally broad. Therefore, the task of placing respondents from diverse disciplines under the academic field designations used in this study was to some extent subjective.

Findings for Online Instructional Experience

Results of analysis used to address the third subsidiary research question regarding the relationship between perceptions of effectiveness and experience teaching online courses are somewhat more conclusive. Analysis using Spearman's rho found slight yet significant correlation values between the number of online classes taught and the total score (P-Total) as well as with several of the individual category variables. A positive correlation (.202) was found between the total score (P-Total) and the number of classes taught and was significant at .01 ($p = .003$). A positive correlation that was significant at .01 was also found for P1 (student faculty contact; .233, $p = .001$), P3 (active learning; .205, $p = .002$), and P7 (promoting respect for diverse learning styles; .176, $p = .009$). Significant correlation was also found between P2 (promoting cooperation among students; .157, $p = .021$), P5 (promoting time on task; .143, $p = .036$), and P6 (communicating high expectations; .161, $p = .017$). Only responses to P4 (promoting prompt feedback) did not have a statistically significant correlation with the number of classes taught.

Similarly, analysis of variance found significant between-group differences on the P-Total ($F = 5.419$, $p = .005$) as well as in several of the practice categories. Analysis of P1 (student-faculty contact; $F = 5.977$, $p = .003$), P6 (promoting high expectations; $F = 4.435$, $p = .013$), and P-Total found differences between all three online experience categories with perceived effectiveness increasing with experience. P3 (promoting time on task; $F = 5.775$, $p = .004$), P5 (promoting prompt feedback; $F = 2.972$, $p = .053$), and P7 (promoting respect for diverse learners; $F = 4.431$, $p = .013$) found differences between all faculty who have taught only one class online and those teaching more than five, with perceived effectiveness reported higher by those with the highest experience level. The positive correlation between P-Total and the number of online classes taught would be anticipated since faculty with more online instructional experience would have been more familiar with the requirements of teaching online courses. However, as with the P-Total rating, there was not a strong correlation for the individual categories. Significant positive correlations ranging from .233 for P1 (promoting student-faculty contact) to .143 for P5 (promoting time on task) indicate that experience teaching online did not have a pronounced influence on faculty perceptions.

It should be noted that the data indicate that the mean rating for each item increased with online teaching experienced on P-Total and all categories. Additionally, single-sample *t*-tests found that faculty who had taught only one online class rated online instruction to be significantly lower than the test value on P1

(student faculty contact; $p = .000$), P2 (promoting cooperation; $p = .011$), and P3 (promoting active learning, $p = .015$). While faculty who had taught two to five classes online also rated online instruction significantly lower than the test value for P1 ($p = .000$) and P2 ($p = .001$), they rated it significantly higher on P4 (promoting prompt feedback; $p = .004$), P5 (promoting time on task; $p = .022$), and P6 (communicating high expectations; $p = .003$). Similarly, faculty who had taught more than five classes online rated online instruction significantly higher than the test value on the P-Total score ($p = .003$) as well as on P4 ($p = .000$), P5 ($p = .000$), P6 ($p = .000$), and P7 ($p = .000$). Additionally, one-sample *t*-tests did not find a significant difference on P1 (promoting student faculty contact) and P2 (promoting cooperation among students) among the faculty with more online instructional experience. These findings are presented in Table 8.

Table 8. Effectiveness Rating * Number of Online Classes Taught: One-Sample *t*-Tests

	Number of online classes taught					
	One		Two to five		More than five	
Effectiveness rating	Sig. (2-tailed)	Mean diff.	Sig. (2-tailed)	Mean diff.	Sig. (2-tailed)	Mean diff.
Promoting student-faculty contact	.000**	–.427	.000**	–.324	.885	–.013
Promoting cooperation among students	.011*	–.321	.001**	–.237	.877	–.016
Promoting active learning	.015*	–.267	.439	–.043*	.071	.147
Promoting prompt feedback	.099	.183	.000*	.306	.000**	.435
Promoting time on task	.943	–.008	.022**	.168	.000**	.315
Communicating high expectations	.532	.073	.003**	.160	.000**	.390
Promoting diversity in learning styles	.435	–.084	.413	.059	.000**	.288
P-total	.246	–.110	.578	.026*	.003**	.227

Note: Test value = 3; $\alpha = .05$.
*Indicates significance at .05. **Indicates significance at .01.

These results indicate a positive trend even for P1 and P2. Despite the relatively low positive correlation, this analysis indicates that the perceived effectiveness of online instruction increases with online teaching experience on all seven principles. A positive correlation between the number of online classes taught and perceived effectiveness of online instruction was found for the total rating (P-Total) as well as for P1 (promoting student faculty contact), P2 (promoting cooperation among students), P3 (promoting active learning), P5 (promoting time on task), P6 (communicating high expectations), and P7 (promoting respect for diverse learning). Similarly, analysis of variance found differences between all three online experience categories, indicating that perceived effectiveness increased with experience. Analysis of variance also found differences between all faculty who had taught only one class online and those who had taught more than five, with perceived effectiveness reported higher by those with the highest experience level. Results of one-sample *t*-tests also indicate that the ratings for perceived effectiveness increased with more experience teaching online.

It is not surprising that the perceptions of the effectiveness of online instruction increases as faculty gain more experience teaching online. The results of this research clearly support this assumption. The findings of this study lead to the conclusion that the perceived effectiveness of online instruction in meeting the criteria identified in the seven principles of effective undergraduate education increased with experience teaching online. Therefore, the evidence indicates that perceived effectiveness is related to the number of classes taught online and therefore does support rejection of the null hypothesis for subsidiary research Question 3.

Findings for Academic Level of Online Class

Analysis of the influence of the class level taught appear to have a more limited influence on the perceived effectiveness than other factors. Crosstab analysis using symmetric lambda found no significant relationships between course levels taught and the total score (P-Total as dependent variable) or for on any of the seven categories (P1 through P7 as dependent variable). However, significant between-group differences were also found for the level of class taught on P1 (promoting student faculty contact; $F = 3.298$, $p = .039$), P2 (promoting cooperation; $F = 5.704$, $p = .004$), and P6 (communicating high expectations; $F = 3.070$, $p = .049$).

Post hoc tests revealed differences between faculty teaching only lower division classes online and faculty teaching only upper division classes online on P1 (promoting student faculty contact), P2 (promoting cooperation), and P6 (communicating high expectations). Therefore, the findings support rejection of the null hypothesis for subsidiary research question 4 and indicate that the perceived effectiveness of online instruction in meeting the criteria identified

in the seven principles of effective undergraduate education is influenced by class level. Additionally, analysis of individual response items revealed that faculty teaching upper division courses scored online instruction higher for activities such as facilitating informal contact with students, getting students to work together on projects, getting students to evaluate each other's work, and encouraging students to challenge the ideas of the instructor or other students.

These results are further supported by the results of single-sample *t*-tests, which found that faculty who had taught only one lower division class rated online instruction to be significantly lower than the test value on P1 (student-faculty contact; $p = .000$) and P2 (promoting cooperation; $p = .000$), and significantly higher on P4 (promoting prompt feedback; $p = .000$). As Table 9 indicates, this finding is in contrast with that of faculty with experience teaching only upper division courses online who similarly rated online instruction significantly higher on P4 (promoting prompt feedback; $p = .000$) but also rated it higher for P5 (promoting time on task; $p = .003$), P6 (communicating high expectations; $p = .000$), P7 (promoting diversity in learning styles; $p = .018$), and P-Total ($p = .027$). Additionally, one-sample *t*-tests did not find the mean scores for faculty teaching only upper division courses online to be significantly different from the test value on P1, P2, or P3. In comparison, faculty who reported experience teaching both upper and lower division classes online rated online instruction significantly lower on than the test value of 3 on P1 ($p = .017$) and significantly higher on P4 ($p = .008$) and P6 ($p = .020$).

These findings lead to the rejection of the null hypothesis for subsidiary research question four. These statistically significant differences may be attributable to several factors. It is possible to conclude that faculty found that students taking upper level courses were more comfortable interacting with their instructors as well as with each other based on having more experience in academic environments than lower division students. Additionally, it can be assumed that even among more traditional-aged students, those in upper division courses would be more experienced with computers and online communication as well as more mature and therefore more socially competent both online as well as in face-to-face interaction with faculty.

However, the smaller class sizes and/or course content and subject matter may be more suited to reflective text-based communication often cited as a characteristic of asynchronous interaction [5]. For example, a seminar-type course involving more in-depth responses may be considered more appropriate for the reflective interaction that is fostered by participants writing out responses to course topics or issues. Therefore, faculty teaching upper division courses may perceive greater effectiveness in online instructional delivery.

Table 9. Effectiveness Rating * Levels of Online Classes Taught: One-Sample *t*-Tests

	Lower division only		Upper division only		Both lower div. and upper div.	
Effectiveness rating	Sig. (2-tailed)	Mean diff.	Sig. (2-tailed)	Mean diff.	Sig. (2-tailed)	Mean diff.
Promoting student-faculty contact	.000**	–.349	.266	–.089	.017	–.353
Promoting cooperation among students	.000**	–.405	.780	–.023*	.854	–.029*
Promoting active learning	.052	–.118	.226	.085	.687	–.059
Promoting prompt feedback	.000**	.306	.000**	.327	.008**	.378
Promoting time on task	.106	.124	.003**	.224	.042*	.272
Communicating high expectations	.083	.092	.000**	.320	.020*	.313
Promoting diversity in learning styles	.682	.031	.018	.182	.258	.140
P-total	.514	–.031	.027	.150	.324	.113

Note: Test value = 3; $\alpha = .05$.
*Indicates significance at .05. **Indicates significance at .01.

SUMMARY

The data indicate that those responding to this survey perceive online instruction as somewhat more effective than traditional instruction at meeting the educational objectives outlined in the seven principles. However, it is clear that when considering the seven principles individually that the perceived effectiveness varies both positively and negatively. More importantly, this variation is to some extent consistent across all variables considered in this study. Therefore, the data indicate that while online instruction may improve some aspects of

the academic experience, it is perceived as less conducive to others. Arguably, while traditional instructional delivery may be perceived to be similarly more and less conducive to various instructional goals, the data identify important instructional objectives that faculty may seek to address more rigorously when teaching online.

The findings indicate a consensus among the study population that online instruction is less effective at interactions both between faculty and students (P1, student-faculty contact) as well as between students themselves (P2, cooperation). This inconsistency may be explained by considering the function of the interaction in the context of the course. Gilbert and Moore discussed the social and instructional interactions required for learning and proposed that both types of interaction are important for learning [19]. If online instruction is perceived to be more effective for instructional interactions, faculty who value this instructional component may perceive online to be more effective. Conversely, if online instruction is less effective at social interaction, then faculty who value this interaction will likely perceive online to be less effective. This is supported by survey data that indicate that the highest ratings found in the individual principles (P1 through P7) were for instructionally related activities such as prompt feedback (P4) and communicating high expectations (P6). Therefore, the study concluded that the perceived effectiveness of online instruction is likely dependent upon the emphasis of the faculty person on instructional interaction versus more informal social interaction.

While the study found that the respondents to this study had a wide range of academic experience, it is apparent that many senior faculty are at the very least experimenting with online instruction and some appear to be utilizing it extensively. More important, since online teaching experience has a significant impact on perceived effectiveness, the combination of greater overall academic experience with online instructional experience will likely contribute to more positive experiences for faculty as well as students.

If, as promoted, online technologies reduce or eliminate the influence of geographic boundaries for students, colleges and universities will be forced into an increasingly competitive environment in which the quality of the learning experience becomes the most important factor in a student's decision-making process. New advances in technology and infrastructure capacity are making more instructional tools available to faculty teaching online which are likely to impact the perceived effectiveness of online instructional delivery. Based on this study, it may be assumed that as the use of online technologies at colleges and universities continues to increase, the collective experience level of faculty teaching online may result in the perceived effectiveness of all online instruction at promoting activities associated with all seven principles will increase as well.

APPENDIX 1
Survey Instrument

Faculty Perceptions of Instructional Practices Using
Asynchronous Learning Networks

This survey is designed to gather data regarding faculty perceptions of effective instructional practices in delivering online instruction. All information provided will remain confidential. The identity of individual respondents or their institutions will not be disclosed. By completing this survey you are consenting to participate in the study.

For the purposes of this study, on-line or network-based courses are defined as credit-courses that involve no scheduled face-to-face class meetings other than exams, proctored tests, or a single initial orientation class. IF YOU DO NOT MEET THIS PROFILE, PLEASE CHECK ONLY THE FOLLOWING BOX AND RETURN THE SURVEY.

☐ **I DO NOT MEET THE PROFILE SPECIFIED ABOVE.**

If you do meet this profile, please proceed with the rest of the survey.

Mark the appropriate box with a check or an "x." Check the box at the end of the survey to indicate that you would like to receive a draft of the findings.

A). Please check the box that most accurately describes your academic rank (mark one):

☐ Full Professor ☐ Associate Professor ☐ Assistant Professor ☐ Instructor/ Lecturer ☐ Other

B). How many years of full-time college teaching experience do you have? (mark one.)

☐ Less than two years ☐ Two to five years ☐ More than five years

C). Please identify your academic department of affiliation (i.e.: Business, History, Engineering, Art, etc.): _____

D). How many classes have you taught that involved no scheduled face-to-face course actrivities other than exams? (If you taught the same course more than once, count each time taught as a separate class): (mark one.)

☐ None ☐ One ☐ Two to five ☐ More than five

E). Please indicate the number of courses you have taught on-line at each of the following class levels (mark all that apply):

100 Level: 200 Level: 300 Level: 400 Level: 500 or above:

F). Which of the following communiation technologies do you utilize in delivering on-line instruction (mark all that apply):

☐ E-mail ☐ Bulletin Board ☐ Real-time Chat
☐ video-audio clips ☐ Other

G). Do you incorporate an initial face-to-face class meeting as part of your on-line course (mark one):

☐ Yes ☐ Sometimes ☐ No

Based upon your experiences teaching both on-line and in a face-to-face classroom environment, please rate your perceptions of the effectiveness of on-line instruction in meeting the stated educational objective relative to traditional classroom instruction. Please type an "X" in the box next to the response that most accurately describes your opinion. Mark only the most appropriate box.

1. Providing opportunities to advise students in your class about career opportunities in their field of study.
   ☐ Considerably More effective
   ☐ More Effective
   ☐ Equally Effective
   ☐ Less Effective
   ☐ Considerably less effective

2. Facilitating informal contact with students.
   ☐ Considerably More effective
   ☐ More Effective
   ☐ Equally Effective
   ☐ Less Effective
   ☐ Considerably less effective

3. Sharing past experiences, attitudes, and values with students.
   ☐ Considerably More effective
   ☐ More Effective
   ☐ Equally Effective
   ☐ Less Effective
   ☐ Considerably less effective

4. Learning to identify your students by name by the end of the first two weeks of the term.
   ☐ Considerably More effective
   ☐ More Effective
   ☐ Equally Effective
   ☐ Less Effective
   ☐ Considerably less effective

5. Making special efforts to be available to students of a culture or race different from my own.
   - ☐ Considerably More effective
   - ☐ More Effective
   - ☐ Equally Effective
   - ☐ Less Effective
   - ☐ Considerably less effective

6. Serving as a mentor or informal advisor to students.
   - ☐ Considerably More effective
   - ☐ More Effective
   - ☐ Equally Effective
   - ☐ Less Effective
   - ☐ Considerably less effective

7. Exposing students to professional activities, meetings, or events in my field.
   - ☐ Considerably More effective
   - ☐ More Effective
   - ☐ Equally Effective
   - ☐ Less Effective
   - ☐ Considerably less effective

8. Getting students to communicate with each other about their interests and backgrounds.
   - ☐ Considerably More effective
   - ☐ More Effective
   - ☐ Equally Effective
   - ☐ Less Effective
   - ☐ Considerably less effective

9. Getting students to prepare together for class or exams.
   - ☐ Considerably More effective
   - ☐ More Effective
   - ☐ Equally Effective
   - ☐ Less Effective
   - ☐ Considerably less effective

10. Getting students to work on projects together.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

11. Getting students to evaluate each others work.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

12. Getting students to explain difficult ideas or concepts to each other.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

13. Getting students to praise each other for their accomplishments.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

14. Encouraging students to discuss key concepts with other students whose backgrounds and viewpoints are different from their own.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

15. Including learning communities, study groups, or project teams in your course.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

16. Encouraging students to join at least one campus organization.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

17. Communicating performance criteria to students so that each person's grade is independent of those achieved by others.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

18. Having students present their work to the class.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

19. Having students summarize similarities and differences among different theorists, research findings, artistic works, etc.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

20. Having students relate outside events or activities to the subjects covered in the course.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

21. Including research or independent study in assignments.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

22. Encouraging students to challenge my ideas, the ideas of other students, or those presented in the course materials.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

23. Requiring students to analyze real-life situations.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

24. Utilizing simulations, role playing, or lab activities.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

25. Encouraging students to suggest new readings, research projects, field trips, or other course activities.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

26. Arranging field trips, volunteer activities, or internships related to the course.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

27. Utilizing students to assist with research.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

28. Delivering and administrating quizzes and homework assignments.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

29. Structuring your course to include exercises and problems that give students immediate feedback.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

30. Returning examinations and papers within seven days.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

31. Providing students with detailed evaluations of their work early in their term.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

32. Requiring students to contact you to discuss their progress.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

33. Providing your students with written comments on their strengths and weaknesses on exams and papers.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

34. Pre-testing students at the beginning of each course.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

35. Requiring students to keep logs or records of their progress.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

36. Discussing the results of final exams with students at the end of the course.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

37. Contacting students who miss scheduled course activities.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

38. Communicating to my students that they are expected to complete their assignments promptly.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

39. Clearly communicating to students the minimum amount of time they should spend preparing for class.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

40. Making it clear to students the amount of time that is required to understand complex material.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

41. Working with students to set their own goals for their learning.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

42. Encouraging students to rehearse in advance for class presentations.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

43. Emphasizing and communicating the importance of regular work, steady application, sound self-pacing, and scheduling.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

44. Explaining to students the consequence of non-attendance or participation.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

45. Communicating to students that full-time study is a full-time job that requires forty or more hours a week.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

46. Contacting students who fall behind to discuss their study habits, schedules, and other commitments.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

47. Requiring students who miss scheduled class activities to make up lost work.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

48. Communicating to students that they are expected to work hard in my class.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

49. Emphasizing the importance of holding high standards for academic achievement.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

50. Using multiple methods to communicate my expectations at the beginning of each course.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

51. Helping students set challenging goals for their own learning.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

52. Communicating to students what will happen if assignments are not completed on time.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

53. Recommending additional reading, writing, or similar tasks in my class.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

54. Encouraging students to write.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

55. "Publicly" calling attention to excellent performance by my students.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

56. Regularly revising your course.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

57. Periodically discussing how well the class is going with the students as a whole.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

58. Encouraging students to speak up when they don't understand subject matter.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

59. Discouraging snide remarks, sarcasm, kidding, and other class behaviors that may embarrass students.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

60. Structuring teaching activities to address a diverse student population.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

61. Relating class readings and activities to the backgrounds of my students.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

62. Providing extra material or exercises for students who lack essential background knowledge or skills.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

63. Integrating new knowledge about women or other under-represented populations into this class.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

64. Making explicit provisions for students who wish to carry out independent studies within my course.
- ☐ Considerably More effective
- ☐ More Effective
- ☐ Equally Effective
- ☐ Less Effective
- ☐ Considerably less effective

65. Utilizing mastery Learning or learning contracts as instructional tools in my class.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

66. Encouraging students to design their own majors when their interests do not align with the structure of standard programs or curriculum.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

67. Identifying students learning styles, interests, or backgrounds at the beginning of each course.
    - ☐ Considerably More effective
    - ☐ More Effective
    - ☐ Equally Effective
    - ☐ Less Effective
    - ☐ Considerably less effective

Thank you for your assistance and participation.

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