Community College Survey Data:
The Impact of Quantity and Quality on Informed Decision-Making

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Abstract

This study surveyed community college faculty members, staff, administrators, and IR Departments (Institutional Research), to investigate how survey response perceptions and practices influenced informed decision-making in terms of survey data quantity and quality. Dataset analysis suggested several outcomes: (1) 90% of the respondents indicated that they would only devote 1-to-15 minutes to a survey; (2) surveys that were short, clear, and of personal interest were much more likely to elicit survey data quality and quantity responses; (3) individuals were more likely to participate if they were able to personally witness change in their respective colleges as a result of the survey data; (4) an incentive to motivate individuals to participate included sufficient time to complete the survey without interruptions; and (5) 70% of the AFS group reported self-motivation as a "huge factor in my responding to surveys." Implications and recommendations are also included in this study.

Survey Response Rates: A Contextual Overview

With so many surveys to choose from and so little time to fulfill all requests, what factors or predictor variables influence survey participation and response rates? Moreover, have informed institutional decision-making options been positively, negatively, or neutrally impacted as a result of lower response rates and/or lackadaisical efforts to conscientiously provide quality-based contextual or rated responses? In the words of Radwin (2009, p.1):

> Though it may not grab headlines like Twitter or Facebook, the use of surveys is one of the fastest-growing and most pervasive trends on campuses, and it's no wonder. With rising demands for systematic evidence and rapidly shrinking costs to gather such data, colleges and universities are increasingly surveying students, employees, and alumni to measure all kinds of things—from engagement to satisfaction to the carbon footprint made in commuting to campus.

With the influx of surveys (Lipka, 2011; Radwin, 2009), what are some of the factors that influence the quality and quantity of survey responses? Porter and Whitcomb (2005) conducted a study which suggested that students responded to surveys as an outcome of gender, social engagement, or personality types, among other variables; Asiu, Antons and Fultz (1998) studied the phenomenon known as *survey saturation* and its detrimental effect on response rates; Goho (2002) suggested that mixed-mode surveys had little positive influential effect on return rates; Porter and Umback (2006) analyzed survey data from 321 institutions and found that response rates were influenced by institutional characteristics, including adequate access to computers which positively impacted web survey response rates; Johnson and Owens (2003) studied the impact survey response rates had on *return rate disclosure* information in journal publishing; VanHorn, Green, and Martinussen (2009) conducted a meta-analysis of survey response rates for a 20-year span, finding that general procedures during the survey process included follow-up, but less emphasis was expended on incentives, pre-notifications, or other response–facilitation methods to maximize or improve response rates; return rates differ by mode of survey administration, gender, and race/ethnicity (Sax, Gilmartin, Lee, & Hagedorn, 2008); and, "surveys that are perceived to take too long to complete may not be viewed favorably and may bring about diminished response [rates]…[while] the anticipated negative effect of a short questionnaire is thought to be motivated by a lack of importance attached to this type of survey." (Beebe, et al, 2010, p. 2).

Although these sample studies indicated potential factors that directly and indirectly impact survey methodology and response rate outcomes, how prevalent are these variables in the community college system? The American Association of Community Colleges (AACC) (2012) identified 1,167 community and technical colleges in the nation (public, independent, or tribal),

with 12.4 million students enrolled in various programs as full-and-or-part-time. Within the two-year colleges, the Digest of Education Statistics (2010), Table 253, identified 638,352 public professional and nonprofessional staff in these 1,167 colleges (private 2-year institutions were listed as an additional 51,559). Assume, for instance, that for most public two-year colleges, there are three terms per academic year. If each employee completed one (1) survey per term, that equates to three surveys per employee per academic year, or 1,915,056 (3 x 638,352) potential surveys; two surveys per person is 3,830,112, and so forth.   Granted, these numbers may not be statistically validated; however, to search the literature, there were no specific references as to the number of surveys conducted in the 1,167 community or technical colleges in an academic calendar year, for five years, per semester, and so forth.

One possible method to *estimate* the number of surveys in the community college would be to obtain a large sample from IR offices, e.g., practitioners with the most experience in the survey process, and to interpolate/extrapolate the results on a linear scale to generalize the number of surveys across the 1,167 community or technical colleges in this country. The problem with this logic is that IR offices do not use tracking methods in emails to count the total number of surveys faculty and staff receive or how many phone surveys are requested, not to mention the near extinct mailed *hardcopy* surveys—or the qualitative focus groups and interviews. The point of logic here is: Who actually knows the volume of surveys (of all types/methods) presented to community college employees—and students? Moreover, does it truly matter that researchers know the quantity of surveys permeating the halls of the community college system?

It significantly matters when return rates negatively suffer because people have begun to 'shun' this research methodology and to approach the data collection instrument as a device that

interferes with their workload or studies (Lipka, 2011). As a matter of survey dataset usefulness

or viability, consider the number of times respondents have completed a survey by answering

every question at a level of *maximum quality of thought*. Stated differently, if survey response

content is a half-hearted attempt to answer the questions as a rote exercise without regard for the

impact that noncommittal responses have on the quality of the dataset—validity, reliability, and

robustness of the dataset become an uninformed, impartial contributor to informed decision-

making. The same is true for scaled responses answered as a matter of obligatory survey

completion, e.g., mark the middle option and submit. As such, without research to discover

methods to improve both the survey data quality and quantity of survey return rates, it is not

outside the realm of possibilities that both the quality and quantity of survey responses have

become generalized and suspect as an effective decision-making support methodology. The two

examples below shed light on the seriousness of survey quantity and quality outcomes and

applicability.

Example 1: Lipka (2011, p. A1) noted that college students are surveyed in some form at

an estimated rate of nearly ten surveys per year. She noted that this process covers things such

as library space, course topics, campus climate, and so forth. In fact, she noted that:

> The accountability movement, of course, accelerates assessment: Colleges must prove
> themselves to accreditors and legislators, and, within campuses, departments contend for
> scarce resources. Nothing shows effectiveness like data, and nothing generates broad-
> based data as quickly and cheaply as an online student survey, which, with an array of
> tools, anybody can now do. But the megabytes of data that such surveys produce may not
> be reliable. That's because students have come down with survey fatigue, the main
> symptom of which is nonresponse. Two decades ago, 70 percent of students would answer
> a survey, campus officials recall. Now, by some standards, a 20-percent response rate is
> decent. In this year's National Survey of Student Engagement, more than a third of
> colleges had less than 30 percent of their students respond. Response rates on individual
> campuses were as high as 92 percent but as low as 4 percent.

Example 2: Shieh (2009) analyzed a study regarding online instruction with results that described online instruction to be perceived as being less effective than the face-to-face classroom instruction. In the study, 30% of the faculty members surveyed reported that online courses did indeed rival face-to-face quality, whereas 70% of the faculty members felt that online learning outcomes were inferior to face-to-face learning outcomes. In terms of data-driven decision-making, administrators surveyed in the same study cited the need for institutions to mesh online learning and activities into their mission statements, create a singular-functioning office to oversee online-learning programs and outcomes, and invite and encourage people from across the institution to participate actively on discussions about online learning (McCarthy & Samors, 2009; Seaman, 2009).

The point of underlying argument by Sheih (2009) is that although administrators responded favorably in regards to the oversight of online instruction, data-driven decisions on the oversight process may be impacted based on the 70% of faculty members responding unfavorably to online learning. Assuming that the quality of these 70% responses were derived from faculty members who responded to the survey with total regard for the actual value of online courses and not from bias or a lack of carefully thought out responses, the administrative decisions would be more aligned to the actual perceptions and practices of faculty members. However, if these 70% of respondents did so with mixed emotions, dislike for online courses, had never taught an online course, or by hearsay had decided they didn't care much for online education, the decisions made by the administrator may have detrimental outcomes to the long-range goals and actual value of distance education at the institution., e.g., the decision to forego mission statements guiding online education, the hesitation to establish offices dedicated to online-learning programs, or the delay to utilize focus groups on the issue. In short, the

institutional outcome may be that online education does not become a major educational

component of the institution in a timely manner (Brynjolfsson et al., 2011; McCarthy & Samors,

2009; Seaman, 2009; Shieh, 2009).

In other words, the idea presented in this research article and in the study by Seaman

(2009; analyzed by Shieh), is that employees in the community college (as well as in colleges

and universities) need to carefully reconsider the value (considering both the quantity and

quality) of responding to surveys as a baseline methodology to specifically impact informed

institutional decisions; moreover, it is *imperative* that administrators provide direct feedback to

community college employees to validate the effort of employees' influence on institutional

policy or practices via survey participation. As further noted by Shieh (2009), whether the

administrator's decision is based on the 70% or the 30% input, it is important to acknowledge

respondent input by providing open and honest feedback as to how the data was used (or not

used) in an informed decision-making process. In this way, employees may very well

understand that they do have an e-voice in decision-making and that their voice is heard loud-

and-clear in the quality and quantity of surveys completed and returned.

Consequently, this study will add to the body of survey-knowledge in the community

college specific to perceptions and practices associated with the quality and quantity of survey

data and response rates, respectively. The study focused on four vital research constructs: (a)

practices and perceptions in responding to surveys; (b) perceptions of survey value or

importance; (c) institutional influence on survey practices; and, (d) the impact of the quality and

quantity of responses on informed decision-making. The characteristics of individuals,

institutions, response bias and outliers, or technology-support as predictors or significant impact

variables were not investigated in detail. The primary purpose in this study was to better

understand the motives or insight into why administrators, faculty members, and staff participate

or refrain from participation in surveys and how these motivations and outcomes might be

interpreted to impact decision-making in the institution or improve survey response rates

(considering both quality and quantity). Additionally, data were collected from IR Departments

to assess their input into the process to reflect their respective perceptions and practices in survey

methods, e.g., are return rates on the decline, innovative methods to improve return rates, the

quality of the responses in terms of whether they are perceived to be on the decline, etc. The

results of this investigation may be useful to decision-makers who seek to improve the quantity

and quality of survey responses to enhance data-driven, informed decisions (Brynjolfsson et al.,

2011).

The QQPC Survey Model (see Figure 1), designed by the researchers in this study,

provides a logical approach to the process of how survey data has the potential to impact

informed decision-making. It is further suggested that the QQPC Survey Model has the capacity

to promote institutional significance as an outcome of 'informed participants.' For example, how

did the data influence policies, practices, or institutional effectiveness? As was indicated by the

sample returns in this study, one of the more consistent indicators from open-ended questions

was that participants desired to be informed as to how their input impacted policies, practices, or

institutional effectiveness. The consensus of the reported data indicated that feedback from data-

driven informed decision-making by administrators served as a predictive motivator for

improving both survey data quality and return rates. Consequently, while there are many forms

of gathering information to make decisions (see Figure 2), when survey data is an influential part

of the decision, the data should be based on validity and reliability (QQPC) to make the best

informed decisions possible—and participants should be informed of data-driven decisions.
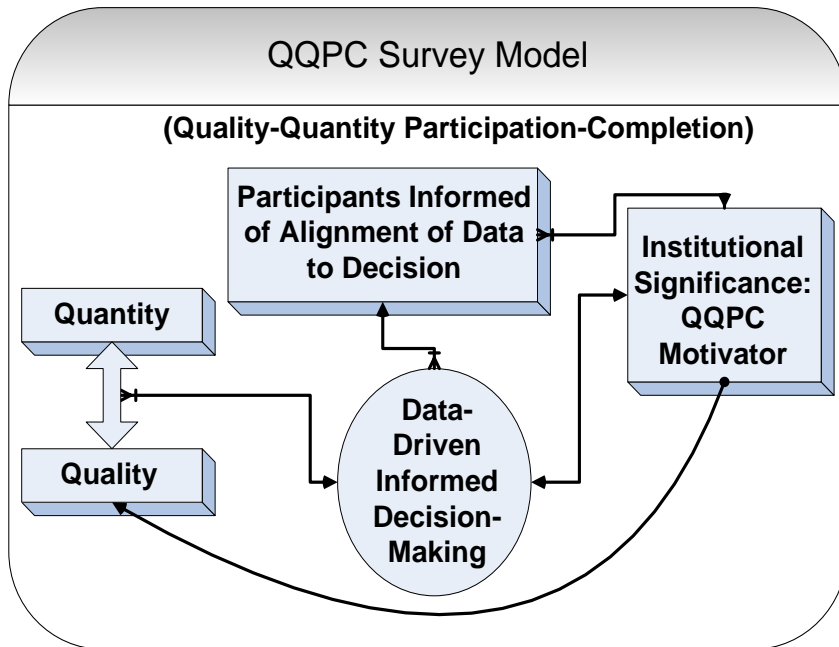
The *QQPC Survey Model* relates the value and importance to both quality and quantity input from surveys used in conducting research. When the dataset has both sufficient quantity and a high-level of quality of the responses, the data-driven informed decision-making is more likely to be the consensus of the individuals within the organization. If the data input has both quantity and quality, the outcome is more aligned with the potential for an organization to reach institutional significance—that is, likely to have influence or effect on outcomes within the organization and the service area. Consequently, if the organization has reached significance, the QQPC will have functioned as a potential motivator for further input via survey methodologies – concurrent with other data collection and decision-making methods.

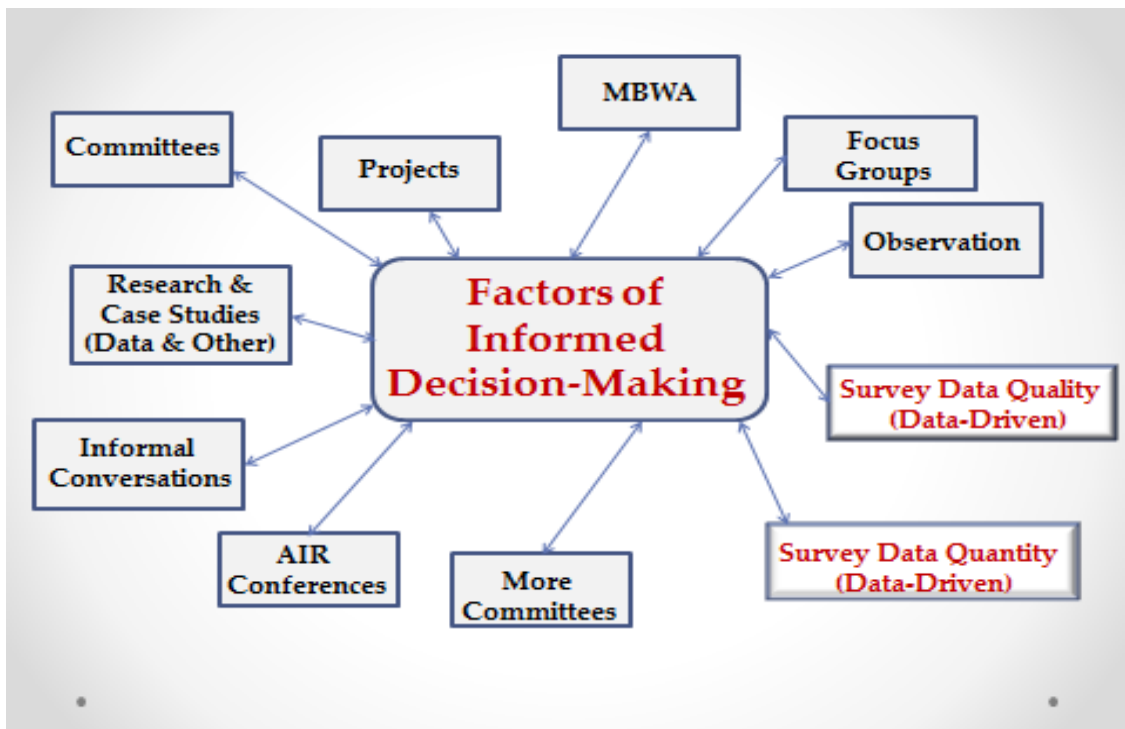Figure 1. *Survey QQPC (Quality-Quantity Participation-Completion) Model*

Figure 2. *Factors of Informed Decision-Making*

A Few Technical Issues

Survey instrument design has been the topic of extensive research, including

confirmatory and exploratory factor analysis (Creswell, 2003; Tabachnick & Fidell, 2007;

Tashakkori & Teddlie, 2003; Yin, 2003). According to Pett, Lackey, and Sullivan (2003, p. 13):

"The development of valid and reliable instruments takes time, patience, and knowledge…with

careful preparation and testing, it is possible to produce, under most circumstances, reliable and

valid measures of a construct…that can be evaluated using factor analysis." Similarly, Moss

(1998, p. 6) suggested in *The Role of Consequences in Validity Theory*, "the definition of validity

is not just an interesting philosophical question; it can be seen to have real ethical, political, and

economic consequences."

To merge these ideas into a cohesive construct for quality-and-quantity-based survey

response rates is to note that when either of these two principles is missing in the survey process,

the outcome of the survey process is negatively skewed towards the idea promulgated by Moss

(1998). Stated in statistical terms, the better the sample quantity in terms of return rates *and*

quality via conscientiously sincere responses, the more likely the data collected will have

positive "ethical, political, and[or] economic consequence", e.g., statistical significance. Even

the best survey instrument of near perfect validity and reliability suffers from a dependency on

the quality and quantity of the responses provided, noting that the number of survey response

rates to achieve statistical significance is a matter of debate (Alwin, 1992; Hull & Keim, 2007;

Johnson & Owens, 2003; Jones, 1996; Nair, Adams & Mertova, 2008; Perkins, 2011).

One additional item on the technical aspect of survey methodologies: it is imperative that

the application of technologies must play a significant role in the survey process. Because

community colleges are adept at discovering new applications for technology, innovative

approaches to promote survey participation must be applied if survey data quality and survey

data quantity are to improve. According to HowTo.gov (2011), a web-site for federal

government program managers on how to collect and maximize customer feedback via online

surveys, the following section provides suggestions in regards to how technology might be used

to improve return rates and also the level of quality of the survey dataset itself:

> **How can technology improve survey questions and overall survey design?**
> Many survey tools enable survey customization for better results. For example, using
> conditional or branching logic, you can hide, skip, or display questions based on
> responses to a previous question. Response biases can be reduced by randomizing
> question order or randomizing response order within a given question. Some survey
> tools allow "answer piping," where answers from previous questions are embedded into
> subsequent questions. In addition, some survey software can send an email alert when a
> customer provides extremely negative feedback. These alerts allow leadership to act
> quickly to address the issue, or to use that feedback for immediate coaching and training
> purposes. Also, some survey technologies can also redirect customers to a new URL or
> pop-up windows with additional information.

This study, therefore, used the following survey questions and methodology to better

understand how respondents view surveys and to research how they react to surveys. While

research has been conducted on survey methods, return rates, and other factors of survey

outcomes, this study will inform IR offices of the perceptions and practices of not only

administrators, faculty members, and staff specific to response outcomes, but will also provide

feedback from IR offices in terms of their practices to improve both survey data quantity and

quality.

Purpose and Methodology

The purpose of this study was to investigate four important community college survey

methodology questions (see Table 1):

1) What are the *current practices in responding to surveys* as reported by administrators,

    faculty members, and staff in the community college?

2) How do administrators, faculty members, and staff in the community college *perceive the*

importance of responding to surveys?

3) How are *survey response rates perceived and influenced by institutional research*

department directors/deans in the community college?, and,

4) How is the *quantity and quality of datasets perceived as impacting informed institutional*

decision-making?

Table 1: *Major components of quality and quantity on informed decision-making.*

Construct	Descriptors
Current practices in responding to surveys	Specific actions taken by individuals to participate or consciously refrain from participation; measurable outcomes such as "as soon as I see a survey, I delete the email" or I am very selective in which surveys I participate…
Perceive the importance of responding to surveys	How does the respondent logically and systematically determine if the survey is important to him/her; can this perception of importance be modified by external means; how does importance (or value) correlate to quality and quantity in survey return rates…
Survey response rates perceived and influenced by institutional research	How do IR Departments perceive response rates, the quality of the responses, and what are they doing to motivate and inspire employees (and students) to participate in surveys and do so with quality as a primary tenet of their responses; what innovative methods are being considered and implemented to increase quantity/quality in survey responses…
Quantity and quality of datasets perceived as impacting informed institutional decision-making	Do return rates and/or the quality of those returns impact and inform the reviewers and users of the dataset to be fully aware of the influence these datasets have on informed decision-making; how do respondents and IR Departments view this construct, from a positive, negative, and neutral reporting outcome; do lower response rates and lower quality responses, in fact, influence informed decision-making…

To obtain data for analysis, the methodology used in this study was an online, self-

reporting survey which included scaled responses and open-ended questions (one survey was

designed and sent to IR departments [identified as IR]; a separate survey was designed and sent

to community college employees outside the scope of the IR domain [identified as AFS,

administrators, faculty members, staff]). The surveys included sections of questions which

measured both perceptions and practices in terms of how individuals responded to surveys. To

facilitate a random sample, the researchers contacted the American Association of Community

Colleges, Association for Institutional Research, the Alabama Community College System, and

other institutions to inform members of the study. The only identifier for participants in this

study was a question to provide the state in which the institution was located.

For this present study, the survey instrument was designed by the researchers. While

there were review cycles and input from survey designers, the survey instruments were not

subjected to factor analysis. That process is suggested for further development.

Results

AFS Group (Administrators, Faculty Members, & Staff Participants)

Of those reporting outside the auspices of the IR Departments (classified as AFS), there

were 647 respondents, with 389 faculty members, 168 staff, 69 administrators (1 non-reporting).

The gender difference was 3-to-1, female to male, respectively, and 55% who responded

classified themselves as Baby Boomers, 37% as Generation X, 9% as Millennials, and 9% as

other. College demographics indicated that 80% of the participants worked at colleges with

1,000 or more students, with 83% of the respondents working at institutions with more than 100

employees, respectively.

Within the AFS Group, there were reported variances as to the number of surveys that

respondents estimated to have been received for consideration and those actually completed (see

Figure 3). As indicated by the data, the majority of the participants received between 0 and 10

surveys, with 83% responding to 10 or less surveys in the past twelve months. Additionally,

only 10% of those who responded to the survey indicated that they had completed between 11

and 25 surveys. The suggested data analysis confirms that the more surveys individuals receive,

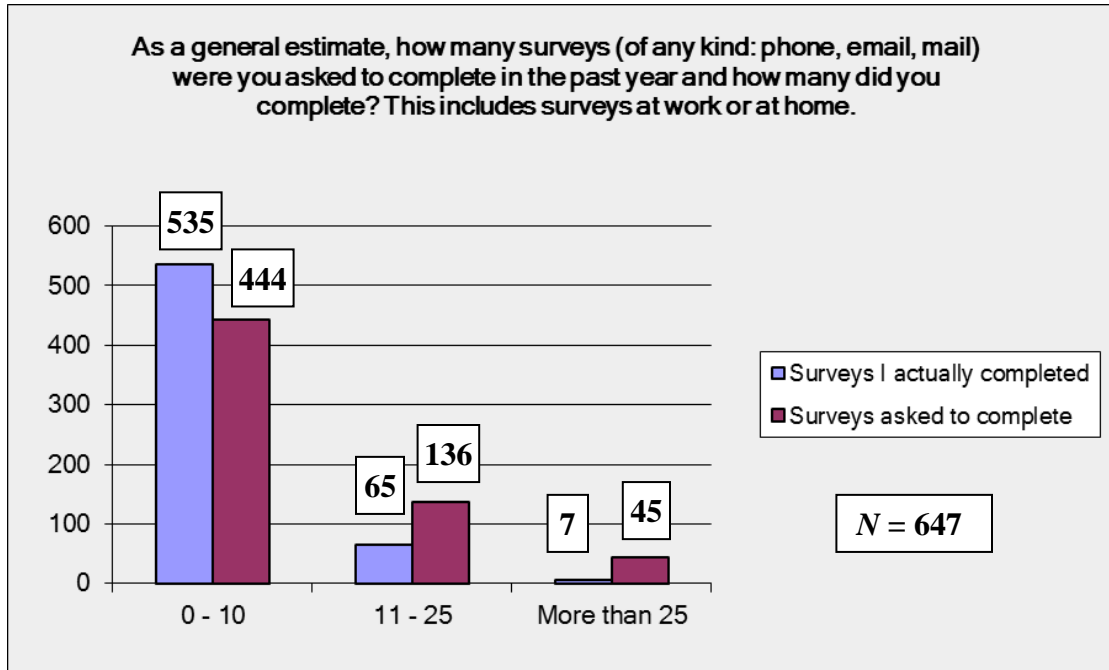the less likely that all surveys will receive a response.

As a general estimate, how many surveys (of any kind: phone, email, mail) were you asked to complete in the past year and how many did you complete? This includes surveys at work or at home.

Figure 3. *Estimated surveys received compared to surveys completed.*

Of significant importance, 90% of the AFS Group indicated that they were willing to devote no more than 15 minutes to *any* survey they received. When asked, *'How likely are you in the future to respond to all questions on a survey by completing each item with carefully thought-out responses?'*, the results were (647 total responses): (a) not likely, 6%; (b) somewhat likely, 33%; (c) very likely, 38%; (d) it depends on the topic of the survey, 38%; and, (e) it depends on length of the survey, 25%. To elicit a sense of validity to the responses to the survey itself, the final question asked participants, *'I gave this survey my full attention and completed all questions truthfully and conscientiously'*, to which 93% responded affirmatively, while 4% indicated that they did not, and 3% selected the option to opt out of responding to the question altogether.

While specific questions were not proffered in regards to the number of surveys participants would respond to in the future or their willingness to participate more aggressively,

Figure 4 offers insight into survey data quality. As suggested by the responses from the sample

population (see Figure 4) *and* if repeated samples were to indicate similar results, the suggested

outcome of survey data quality is somewhere in the range between 'somewhat likely' to 'very

likely' that respondents would give careful thought-out responses to survey questions in the

future. Moreover, responding to surveys is dependent on two primary factors, among others: (1)

survey topic; and, (2) length of the survey itself, which correlates to the feedback that 89.6% of

respondents indicated that they would only contribute 1 to 15 minutes to complete a survey (see

Figure 5). Additional factors influencing survey data quality and quantity are noted in Figure 6.
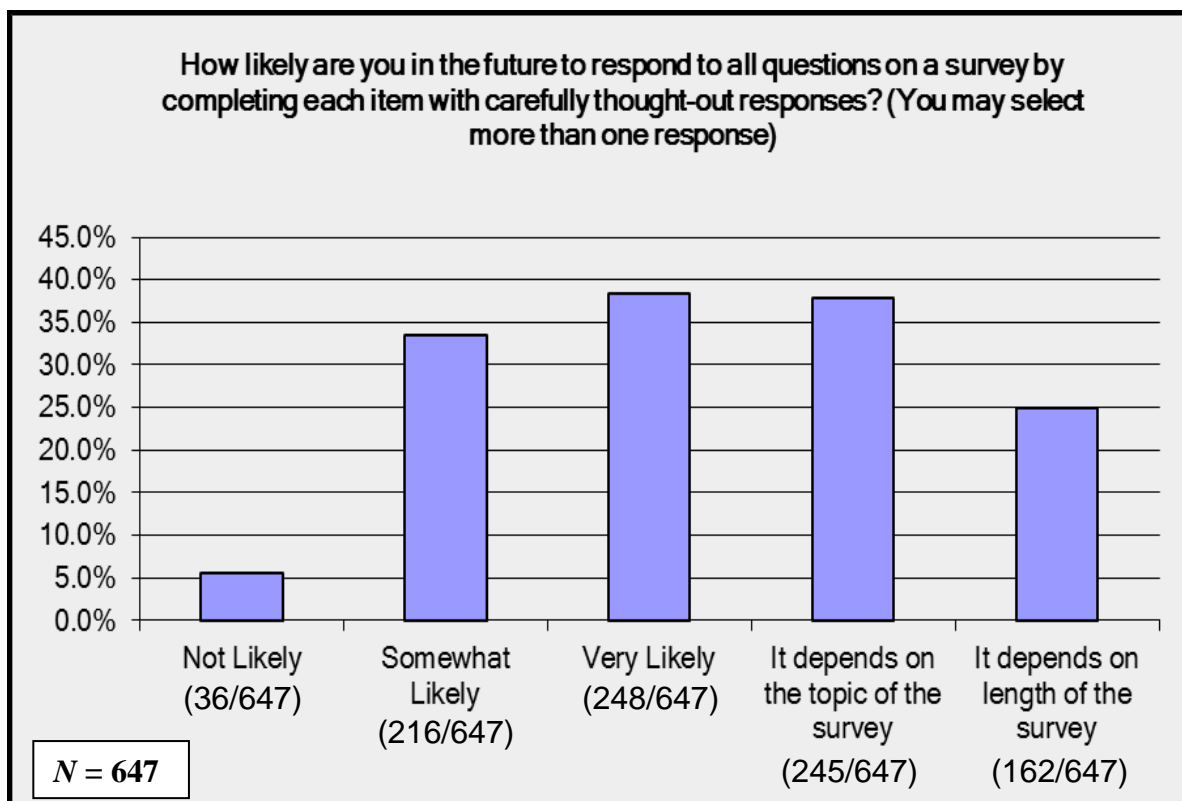

Figure 4. *Likliness of responding to surveys and the level of response.*
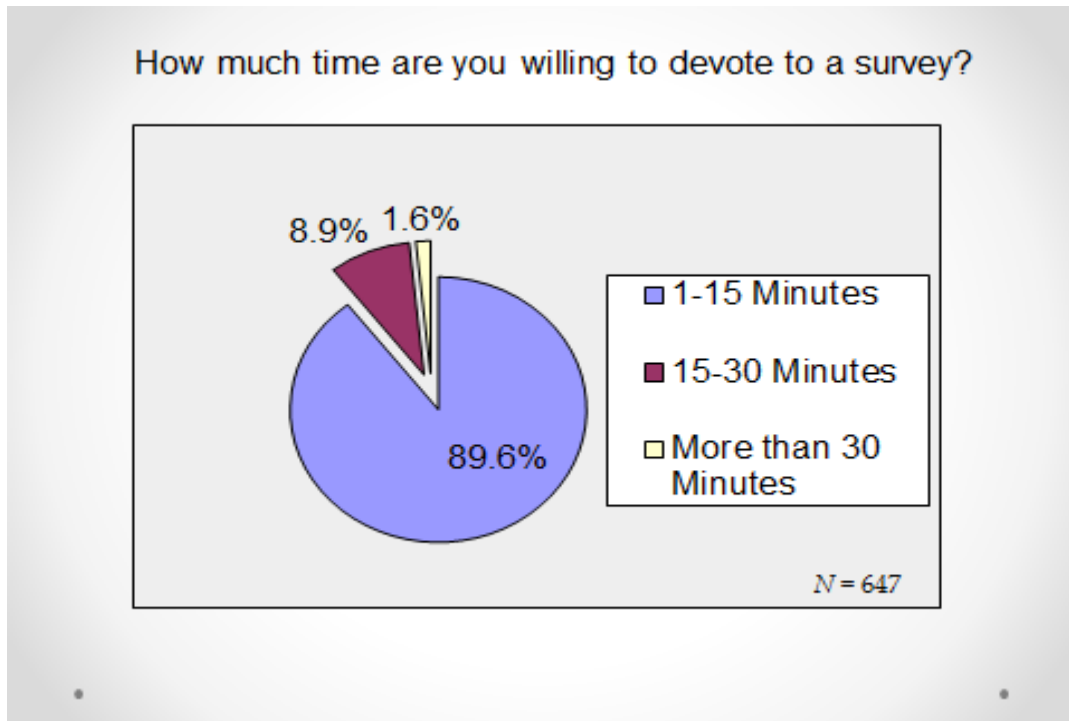
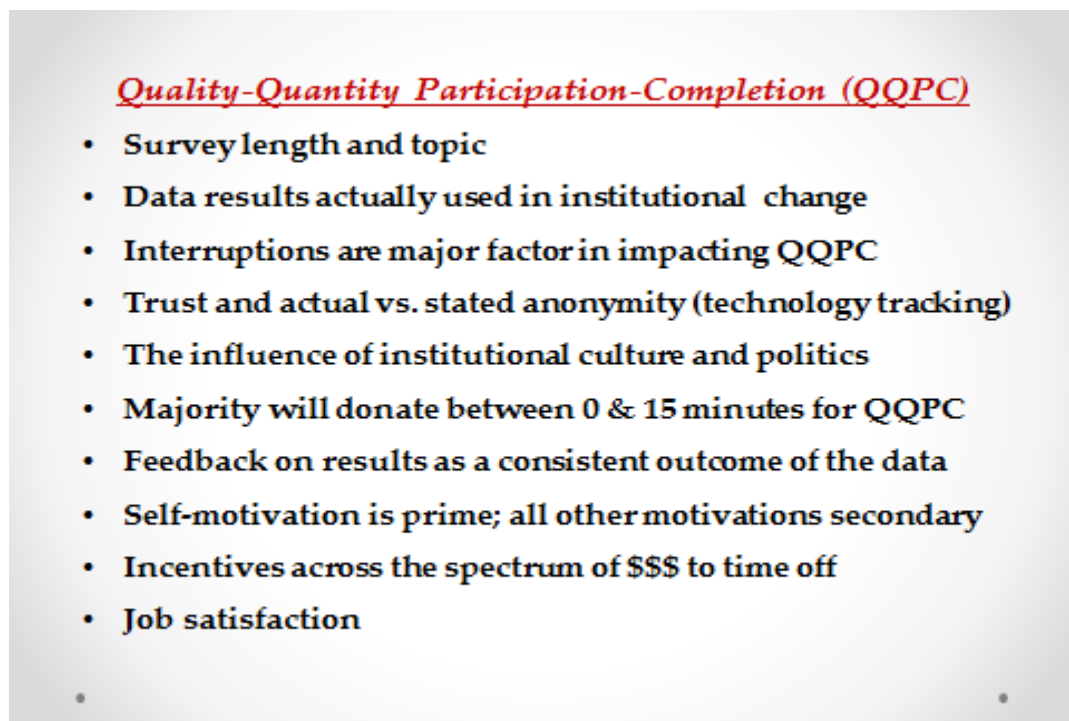Figure 5. *Time participants will devote to a survey.*

Figure 6. *Factors impacting survey data quality and quantity.*

To address the first two survey methodology issues, the survey questions and responses are provided in Table 2. To reiterate, these questions attempted to measure *current practices in responding to surveys* and *perceptions of the importance of responding to surveys*. Within this section of the dataset, the reliability coefficient of the data was .634. Two groups (Group 1: Male/Female; Group 2: Administrators/Faculty/Staff) were analyzed to determine statistical significance and differences in their perceptions and practices in responding to surveys. The dataset was significant at $p \leq .01$, with several factors reaching statistical significance at $p \leq .05$ (see Table 2). All other factors were not statistically significant for gender or administrators, faculty members, and staff responding to the study. Using Principle Component Analysis (PCA), the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .820, while Bartlett's Test of Sphericity was significant at $p < .001$, indicating that factor analysis is an appropriate statistical method to evaluate the dataset for reliability and interdependency of the survey questions for further development of the survey instrument, e.g., reduce number of questions.

While the data analysis in Table 2 provides input into the factors influencing survey data quality and quantity, specifically the practices and perceptions of survey outcomes, one additional column of information is noted. For example, an option was provided for respondents to reveal their opinion via the 'Neutral' response. For this study, 'Neutral' is a non-delimiting, undefined indicator in the scaled responses. Further study into the definition of 'Neutral' is recommended so that inference in this option might shed light on what the intent of the response purported to be for participants. To reiterate, if 'Neutral' was synonymous with 'I have no opinion', does this constitute a non-response or is the respondent actually indicating the absence of a decisive perception or practice on the factor being measured in the survey? Consequently, the 'Neutral' responses may indicate potential outliers, or it may hide valid information.

Table 2: Experiences, perceptions, or practices in responding to surveys (AFS Group)

	Values shown are percentages.	SD	D	N	A	SA	*M*	Sig. * AFS	Sig. * M/F
1	When presented with a survey, I make every effort to respond	1.7	7.3	19.0	**54.5**	17.4	3.81	.626	**.037***
2	When answering a survey, I give each item careful consideration	1.6	2.6	9.3	**66.7**	19.8	4.02	.909	.165
3	Responding to surveys is my responsibility as an employee	3.1	17.1	22.9	**43.1**	13.8	3.50	.055	**.024***
4	I am more likely to complete a survey if an incentive is offered	8.0	24.9	**28.5**	21.2	17.4	3.15	.435	.558
5	If I'm busy when a survey arrives, I seldom complete it at a later time	6.6	**41.1**	19.6	27.1	5.6	2.83	**.043***	.054
6	I don't want to be identified if I submit legitimate negative feedback	4.7	12.1	22.6	**34.5**	26.2	3.64	.425	.144
7	The results of survey data are to influence informed decision-making	3.0	4.9	15.3	**53.1**	23.8	3.89	.586	.942
8	If my schedule is full, even short surveys are likely to go unanswered	8.0	**40.5**	15.8	30.1	5.5	2.83	.191	**.049***
9	I've responded to surveys before without understanding their purpose	7.3	26.6	13.8	**44.4**	7.9	3.23	.443	.114
10	In general, I think people don't take surveys seriously anymore	1.6	10.9	23.8	**49.4**	14.3	3.66	**.037***	**.029***
11	Without a culture of trust in the organization, I will not "open up" on surveys	2.8	20.5	16.0	**40.8**	19.9	3.54	**.024***	.430
12	Survey data MUST be used to guide professional development	2.5	12.1	27.3	**41.3**	16.7	3.60	.545	.620
13	Regardless of workload, I respond to a survey from the President	2.4	5.6	14.0	**42.6**	35.5	4.03	.242	**.002***
14	If I don't perceive the survey as important, I will not participate	5.2	26.4	21.7	**39.7**	7.0	3.16	.101	.074
15	I am prone to click any answer to a question if I don't understand it	20.9	**52.2**	12.3	12.0	2.5	2.25	.700	.960
16	I assign importance to a survey if the topic is of interest to me	3.8	10.5	11.7	**53.7**	20.3	3.77	.108	.230
17	I don't actively encourage colleagues to participate in surveys	7.2	22.2	31.6	**35.0**	4.0	3.06	.531	.013
18	I am simply too busy these days for surveys	6.5	**38.4**	31.1	20.6	3.5	2.75	.854	.818
19	More often than not, the time I could devote to completing a survey is more important to me for other purposes than the issue the survey is measuring	4.3	27.3	**31.7**	31.5	5.2	3.07	.053	.683
20	College administrators are responsible for promoting the positive practice of survey participation to achieve continuous improvement at the college	1.6	10.7	25.2	**51.1**	11.5	3.61	.620	.161
21	My experience has been that survey results have changed very little at my institution	1.6	17.4	**37.6**	28.1	15.3	3.37	.479	.275
22	I prefer a survey that has options for me to voice my opinion, not just multiple choice options	3.0	20.0	30.1	**37.1**	9.8	3.30	.709	**.031***
23	Surveys have the very real potential to influence ethical, political, and/or economic consequences	2.9	14.5	27.8	**45.9**	8.9	3.44	.900	.988
24	I would volunteer to serve on a committee that develops institutional surveys	17.0	**30.1**	22.3	24.0	6.5	2.71	.148	.270
25	Self-motivation is a huge factor in my responding to surveys	2.4	8.4	19.4	**57.3**	12.5	3.68	**.030***	.395

N = 647; (1) SD: Strongly Disagree; (2) D: Disagree; (3) N: Neutral; (4) A: Agree; (5) SA: Strongly Agree; p value; *M* = Mean; AFS: Administrators, Faculty Members, & Staff; M/F: Significance in Gender.

Several perceptual-variables impacting survey responses or the quality of the responses themselves were indicated in the open-ended questions. Among the most often cited problems and/or motivators associated with survey responses and the quality of the answers given were: (a) survey length or available time to complete a survey; (b) interruptions during the attempt to respond to surveys; (c) variations of questions on the same or similar topic; (d) not qualified to comment on certain sections of various surveys; (e) realization of the value or importance of the survey questions; (f) survey is efficiently designed to minimize time-on-task and questions are clear and relevant; (g) anonymity issues; and, (h) issues of self-driven motivation to participate as a team player.

To support the data analysis and inform the reader from the perspective of participants, the following limited sample comments offer insight into the perceptions and practices of participants (numbers have been randomly assigned to ensure anonymity and confidentiality):

AFS135: Open ended questions like this are difficult for me, time consuming, and tells me (as having completed my doctorate already) that you need to have clear choices for data analysis. Open-ended questions are good for you to learn more and tweak your instrument, but I would not allow you to have data analysis from a lot of open-ended questions such as these if I were on your committee. Also, a lot of open-ended questions attract nuts (such as me—you are thinking) and it makes the survey too long. I take it back after completing the survey - you do have a decent instrument - good luck.

AFS169: I am receptive to surveys that address important topics where I feel I can provide important information. If I don't feel I can contribute, or the topic is trivial I don't feel compelled to answer.

AFS275: Evaluations are absolutely crucial to help gather data to refine and readjust problem areas; without closing the critical feedback loop, how would effective changes be addressed and implemented?

AFS110: Too long and not informed in advance how long the survey will take. Repeatedly asking the same question, but wording it in a different way.

AFS62: The only reason I would fail to complete a survey is if some immediate need of my work was considered by me to be of a higher priority.

AFS15: I usually do not answer most surveys because I do not have a connection with the subject of the survey and I regard phone surveys as a waste of my limited time and an invasion of my privacy.

AFS80: I have some measure of hope that my perspective is helping to improve things in some small way by giving my superiors my honest appraisal of things.

AFS156: The primary reason I do not finish a survey is because a student comes in and I get started helping them and just never finish the survey. It is my job to service students.

AFS98: Receive a nasty email saying I have not completed the survey. My name will be added to the "BAD" faculty "list."

AFS50: The information provided may be valuable to whoever is doing the survey and may provide information that will help them better serve the public.

AFS166: I have only stopped one survey part way through, and that was because the survey was very poorly designed and not collecting the proper information on that topic. I had to repeatedly answer questions that did not address the topic of the survey, and I was forced to provide information about subjects that either did not apply to me or my area of knowledge.

AFS223: Too time consuming and asking the same question several times with just different wording. Also, knowing my opinion really doesn't matter.

AFS317: The survey is too long or too complicated. Also, I am unsure how often those who give surveys actually use the information.

AFS373: Start because they are required or provoke my interest, don't finish because they ask for too much detail or too many questions.

AFS411: Too many repetitions of identical questions for different items, aspects, combinations, etc., or poor survey design, such as requiring an answer for a question you've previously indicated doesn't apply to you, e.g. required follow up questions about an item I've already indicated I don't own. Another example of poor survey design would be vague questions such as "Please provide the following student/employee demographic information." Is that the number of students/employees at the college where I work, the number with which I personally interact (extremely hard to quantify since I do not teach classes), or the number currently in existence anywhere? Since there is very little indication of the purpose of this survey, I can't infer meaning from context.

AFS198: I start and then there's something I need to take care of right away, and it takes precedence over the survey.

AFS356: I believe that surveys for certain topics are extremely important in research on how a product or situation affects different genders, races, personalities. It also impresses me that I am considered important enough to be included in a survey, especially surveys regarding student and instructor needs at the college in which I am an instructor.

AFS392: Many people do not trust the anonymity of electronic surveys because they know IP addresses can be tracked. Nothing delivered and returned via the Internet is can be guaranteed to be anonymous. This is why many surveys do collect true, useful feedback. If an employee feels insecure in his work environment, no amount of assurance of anonymity will convince him/her to answer an electronic survey with honest, but negative responses.

IR Group (Institutional Research Department Participants)

To address the outcomes of the second two survey methodology issues, the survey questions and responses are provided in Tables 3, 4, and 5. To reiterate, these questions attempted to assess *survey response rates perceived and influenced by institutional research departments* and *quantity and quality of datasets perceived as impacting informed institutional decision-making*. There were 36 two-year institutions represented by IR Departments responding to the study, which included Alabama, Georgia, North Carolina, Ohio, Wisconsin, Texas, Michigan, and Missouri. While the sample size was minimal, 63% of the IR participants reported 6 or more years of experience, with 38% between 0 and 5 years. The breakdown by gender was 69% female, with only 31% male; 88% were employed at institutions with 1,000 or more students and 85% had 100 or more employees. Generally in-line with other studies (Lipka, 2011; Porter, 2004), participants indicated that response rates have declined (62%), remained about the same (32%), or have increased (6%), (see Figure 7), whereas the quality of the dataset has declined (44%), remained about the same (35%), or has improved (21%), (see Figure 8).

As a focal point to identify the negative aspects impacting the quality and quantity of survey participation, respondents were asked to rate several variables as well as provide additional factors they considered important (see Table 3). The outcomes of this data are to inform IR departments of feedback that may be useful in identifying and countering these variables as survey design is being considered within the respective institutions. For example, as previously noted, the AFS group asserted that to potentially improve survey data quality and quantity, it was important to promote the issue that survey outcomes result in change that supports institutional effectiveness. As a point of correlation, the IR group was asked if 'skepticism surveys actually result in changes', was a negative impact variable on survey data

quality and quantity. The responses were 56% that strongly agreed, while 31% agreed. In short,

87% of the IR respondents reported that the perceptions of survey participants indicated that a

lack of identifiable change directly related to the data submitted was a direct negative impact

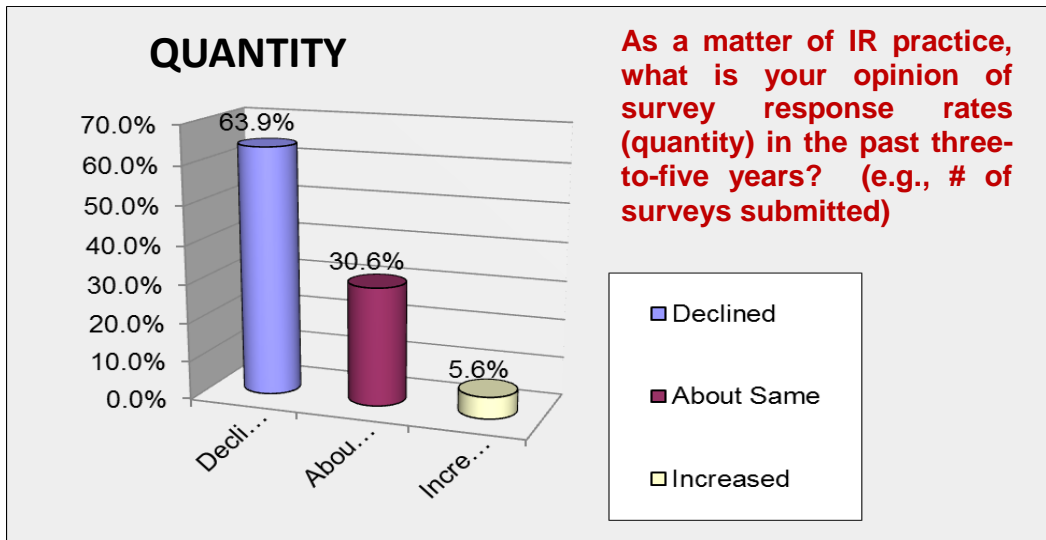factor on survey data quality and quantity (see Table 3 and Table 2, Q's #7, 12, 21, & 23).

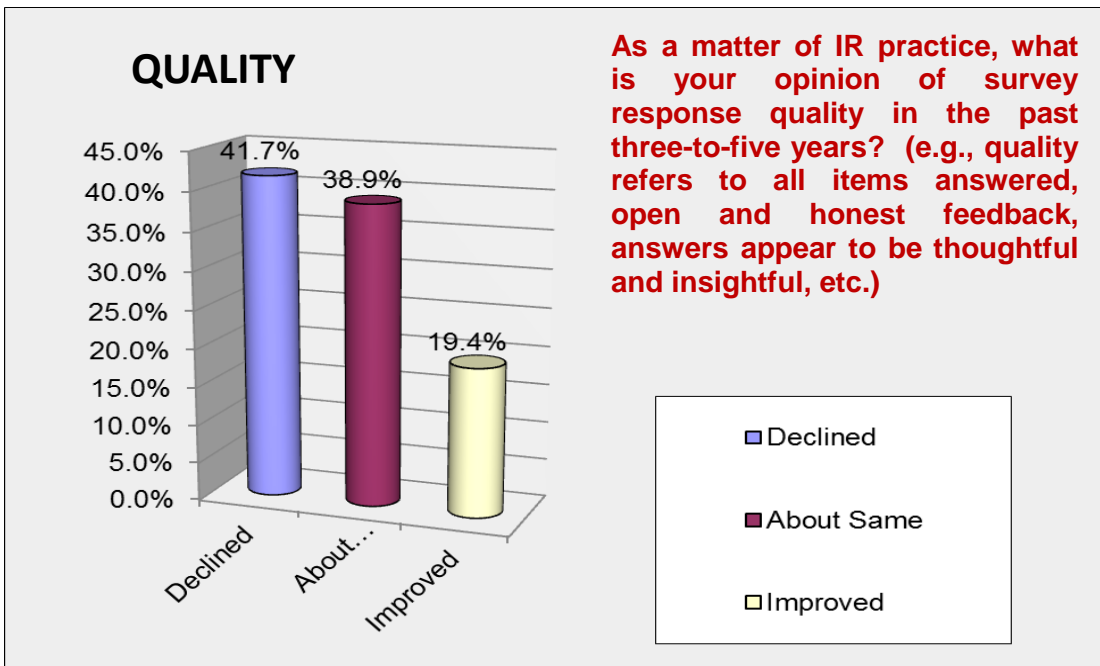Figure 7. *Survey Response Rates (Quantity) as Reported by IR*

Figure 8. *Survey Response Rates (Quality) as Reported by IR*

Table 3: Variables Negatively Impacting Quality/Quantity of Survey Participation & Comments

Negative Impact Factors (IR)	Not Important	Somewhat Important	Important	Very Important
Lack of motivation to complete 'another survey'	0%	11%	44%	44 %
Busy schedules limiting time for survey completion	3%	19%	56%	22%
Survey participant identification	25%	19%	39%	17%
Responses being used 'against' participants	37%	17%	31%	14%
Skepticism surveys actually result in change	0%	17%	31%	56%
A lack of trust between employees and administration	11%	31%	36%	22%
The lack of incentives to promote participation	26%	31%	26%	17%

N = 36

IR comments on other "negative" factors:
1. Some people will not respond to a survey if they do not know the person/department administering the survey. Others may not respond simply out of apathy;
2. Too many questions on the survey;
3. I have found that surveys are usually designed to obtain the surveyor's desired answers. I don't feel that the input is particularly meaningfully used;
4. Lengthy, badly designed surveys;
5. Paranoia;
6. Too many surveys and ease at "deleting" surveys;
7. Amount of surveys has increased. Respondents may be getting burnt out.

Table 4 and Table 5 provide feedback from the IR respondents in Group 1 and Group 2

questions of the survey (Group 1 and Group 2 questions are not factored, nor specific to intended

constructs; these groups are structured to delimit the fatigue of the number of questions presented

to IR participants). The scaled questions intended to gain insight into how those in the IR arena

perceive and practice survey research methods to improve survey data quantity and quality.

While this study recognizes previous survey research, a specific inflection of this investigation

was to seek direct IR input separate from all other survey participants so that IR data feedback

might be used to improve survey outcomes. A few impact variables reported were: (1) trust in

the organization and how it impedes or promotes participation; (2) the use of data to promote

change; (3) survey fatigue; (4) anonymity issues; (5) innovative incentive offerings; (6) length

and number of surveys presented; and, (7) student and faculty (employee) survey data is equally

important to the organization (see Table 4 and Table 5).

Table 4: Group IR (Group I Questions) Survey Data Integrity and Informed Decision-Making

	Values shown are percentages.	SD	D	N	A	SA	M	Sig. * Exp.	Sig. * M/F
1	I seldom use validated surveys from other sources	11.8	29.4	17.6	**32.4**	8.8	3.03	.842	**.032**
2	I expect collected data to be used for decision-making	2.9	0.0	5.7	**48.6**	42.9	4.33	.645	**.042**
3	My perception is that employees trust the IR department	5.7	5.7	25.7	**42.9**	20.0	3.63	.315	.606
4	The quality of a dataset is seldom discussed in IR	17.1	**40.0**	17.1	25.7	0.0	2.54	.741	.874
5	I can easily recall decisions based on survey data	8.6	22.9	14.3	**45.7**	8.6	3.24	.442	.894
6	Only positive survey comments should influence decision-making	**62.9**	31.4	5.7	0.0	0.0	1.45	.204	.380
7	Only negative survey comments should influence decision-making	**57.1**	28.6	11.4	2.9	0.0	1.63	.858	.775
8	I personally use data to make informed decisions	2.9	0.0	8.6	**62.9**	25.7	4.03	.554	.530
9	Low return rates negatively impact data-driven decisions	2.9	17.1	20.0	**34.3**	25.7	3.60	.110	.767
10	The culture of the institution impacts response rates	0.0	11.4	2.9	**45.7**	40.0	4.09	.463	.670
11	My administrators rely on survey data to make informed decisions	2.9	25.7	17.1	**45.7**	8.6	3.36	.974	.632
12	The culture of the institution impacts data quality	0.0	2.9	11.8	**44.1**	41.2	4.18	.354	.368
13	A mixed-methods survey improves data quality	2.9	5.9	**38.2**	34.3	17.6	3.56	.621	.148
14	The overuse of surveys has a highly negative impact on return rates	2.9	5.7	11.4	37.1	**42.9**	4.06	.479	.563
15	Qualitative responses are consistently used in institutional decisions	5.7	14.3	37.1	**42.9**	0.0	3.15	.620	.833
16	I often help administrators interpret data for decision-making	5.7	5.7	14.3	**57.1**	17.1	3.72	.937	.537
17	Employee survey data is used for continuous improvement	5.7	25.7	**28.6**	25.7	14.3	3.15	.542	.432
18	Respondents are more likely to thoughtfully respond to shorter surveys	0.0	2.9	5.7	**51.4**	40.0	4.27	.930	.371
19	My perception is that 'survey fatigue' impacts survey quality and response rates	0.0	0.0	5.7	**45.7**	48.6	4.39	.454	.518
20	Shorter surveys tend to improve quality and response rates	0.0	5.7	2.9	**57.1**	34.3	4.18	.297	.169
N = 36; Dataset significant at p < .001; (1) SD: Strongly Disagree; (2) D: Disagree; (3) N: Neutral; (4) A: Agree; (5) SA: Strongly Agree; p value; *M* = Mean; Exp: Experience across 0-5, 6-10, > 10 years.									

Although this study indicated an *N* of 36 responses, those responses were from experienced IR individuals who were knowledgeable on the topic under investigation. However, to ensure reliability of the present dataset, it is recommended that this study be repeated in separate sample sizes and geographical locations to validate the corresponding datasets.

Table 5: Group IR (Group II Questions) Survey Data Integrity and Informed Decision-Making

	Values shown are percentages.	SD	D	N	A	SA	*M*	Sig. * Exp.	Sig. * M/F
1	Employees are skeptical about being identified in surveys	0.0	5.7	0.0	**48.6**	45.7	4.42	.591	.892
2	Lower response rates reduce dataset reliability	0.0	5.7	14.3	**57.1**	22.9	3.96	**.004**	.550
3	It is more important to have quality responses than all survey questions answered	2.9	5.7	17.1	**54.3**	20.0	3.78	.676	.093
4	Employees are encouraged to complete surveys from any location of their choosing, even access from home	0.0	5.7	11.4	**62.9**	20.0	3.93	.815	.489
5	I believe that employees trust reports generated from surveys	2.9	25.7	28.6	**37.1**	5.7	3.18	.452	.758
6	The more surveys I administer, the more the data will help the institution solve its respective problems	5.7	**42.9**	28.6	14.3	8.6	2.81	.399	.268
7	There is no relationship between survey quality and informed decision-making	20.0	**54.3**	14.3	8.6	2.9	2.24	.479	.871
8	Survey data is one of the most important elements in informed decision-making	5.7	22.9	20.0	**42.9**	8.6	3.27	.910	.806
9	An executive summary of all data collected is provided to employees	8.8	26.5	20.6	**32.4**	11.8	3.03	.070	.921
10	With current fiscal constraints, surveys should be discontinued	26.5	**58.8**	11.8	0.0	2.9	1.93	.853	.217
11	Trust between administration and faculty/staff is the most important element in survey quality and quantity	0.0	14.3	31.4	**45.7**	8.6	3.45	.720	.292
12	Decision-making bias is more likely without survey data	0.0	2.9	**40.0**	**40.0**	17.1	3.69	.183	.147
13	Employee perceptions of institutional practices strongly influence survey quality	5.9	0.0	8.8	**64.7**	20.6	3.93	.949	.806
14	Survey data provides a critical input function into accreditation standards and core requirements	0.0	11.4	14.3	**40.0**	34.3	4.00	.592	.230
15	The IR department is satisfied with its survey methodologies	5.7	**42.9**	25.7	17.1	8.6	2.84	.530	.607
16	The IR department has plans to create innovative survey methodologies to improve survey response quality/quantity	2.9	14.3	25.7	**51.4**	5.7	3.51	.211	.357
17	External datasets collected are made available to employees	2.9	32.4	17.6	**35.3**	11.8	3.18	.855	.088
18	Innovative survey methodologies will not improve survey return rates	8.6	**48.6**	28.6	11.4	2.9	2.57	.164	.469
19	Student survey data quality is as important as faculty survey data quality	2.9	2.9	14.3	37.1	**42.9**	4.15	.780	.845
20	Focus groups should replace survey collection practices	14.7	**38.2**	32.4	14.7	0.0	2.43	.664	.162

N = 36; Dataset significant at p < .001; (1) SD: Strongly Disagree; (2) D: Disagree; (3) N: Neutral; (4) A: Agree; (5) SA: Strongly Agree; p value; *M* = Mean; Exp: Experience across 0-5, 6-10, > 10 years.

The following comments were provided by the IR participants and will add depth to the data represented in Tables 3, 4, and 5. The following questions were posed to respondents, '*As a matter of IR practice, what is your opinion of survey response rates (quantity) in the past three-to-five-years?*' and '*what would you do to improve survey data quality and quantity?*' (e.g., # of surveys submitted), with the following results:

IR10: Response rates are traditionally low and average around 30% for most of the surveys we distribute unless online. The paper-based surveys we conduct have a much higher response rate.

IR22: This is indicative of both online and mail in surveys.

IR17: Using online assessment tools has actually reduced the number of student participants and yet increased for staff.

IR34: Amount of surveys has increased. Respondents may be getting burnt out.

IR25: My answer is an educated guess.

IR11: We find it hard to get faculty and students particularly to complete surveys.

IR29: I think most surveyors are not putting enough attention into getting a favorable return rate. I don't think they go after their audience well enough, usually.

IR3: I do the survey analysis for our institution, trend rates have remained about the same, within 1-2% over the past 3 years.

IR21: Showing evidence that survey results were in fact used in planning and helping to make decisions would encourage people to complete surveys and be honest in their answers.

IR19: Survey incentives are quite often helpful, but not always necessary. Communication between administration, faculty, and students is the key to a successful surveying process. All parties must understand the importance of the survey and comprehend how survey results relate to the ongoing process of improvement in order to collect meaningful data. Otherwise, it is a fruitless effort.

IR4: Use online surveys, assure anonymity, make questions very precise and use examples, if needed . . . also, use surveys for only important issues rather than relatively unimportant things. To the extent possible, demonstrate that survey results are used in making future changes.
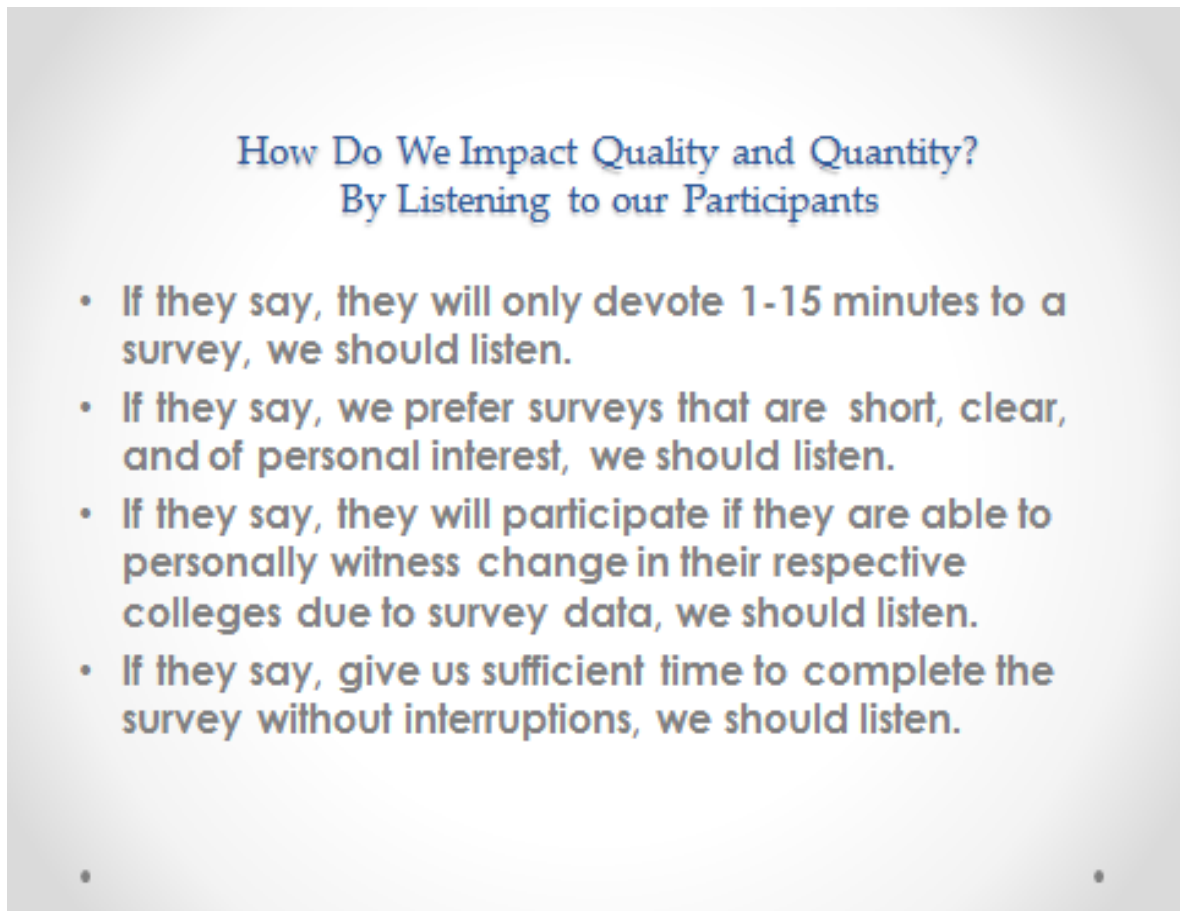
IR12: My experience is that faculty and administration fail to use data because they don't understand the ins and outs of it. They also don't have a bunch of time to interact with the data so they tend to make decisions from their own experience and look for data to back up their experience. My staff people are much more interested in looking at data and then making decisions. Faculty/staff are comfortable with taking surveys generated by the IR office because they trust us to keep them anonymous. They are not so trusting of surveys generated by other offices.

Implications and Recommendations

As noted by the participants in the AFS Group, several factors influence not only the perceptions of their willingness to participate, but also their outlook of the value and importance in participating in surveys when they are presented. As also noted in this study, it is not only vital that surveys continue to be administered, variations in the process must also be considered. For example, if over 90% of those who are willing to respond to surveys will only devote between 1 and 15 minutes to give thoughtful answers to surveys, as well as respond to the total items included on the survey, survey design should reflect this time-delimited expectation. If the vast majority of the respondents in this study indicated that interruptions are a major factor in responding to surveys, the process of when to administer surveys may require an innovative approach outside the normal work day.

Additionally, from the feedback of the AFS Group, there were several notations that indicated the willingness of participants to help improve their respective organizations via the quantity and quality of their input. The information that there are individuals who are motivated to respond to surveys to bring about change is an understated imperative to inform survey design methodologies to imbed identifiable outcomes in the survey instrument. In other words, to improve the impact of quantity and quality survey data on informed decision-making, institutional outcomes should be clearly identified as goals of the survey instrument and that participants have a viable voice in bringing about change. Without this linkage to the source of

the dataset (people who respond to surveys, who have the most experience, the individuals with

the insight into what works and what does not), elements of time, distraction, purpose, etc., will

continue to offer little remedy to improving survey rates or the quality of the responses offered

by those giving their time and energies to complete 'another survey.' Survey data quality is the

nemesis to status quo, the friend of institutional success, and the foundation for institutional

significance. (See Figure 9)

See Figure 9. *Summary of suggestions for survey data quality and quantity*

Conclusion

To improve survey response rates and the quality of the responses, survey designers must view their potential clientele differently. Included in this *paradigm shift* should be the idea that potential participants are not fodder for high return rates, but are the source of viable perceptions and practices that may very well offer vital solutions to issues and problems facing community colleges. To simply collect the data so that a numerical report might be generated is to potentially overlook ideas that otherwise might have solved all types of problems or addressed issues within the two-year system of higher education. In short, when all avenues of information have been given a voice, the decisions that are ultimately made will be made from a position of informational-strength; informational-strength is derived from the inflection point of quantity and quality responses within the survey methodologies employed on a daily basis in the community colleges throughout the American higher education system.

"Will you share the results of this survey?" was one of the most poignant questions or responses posed by the aggregate of participants. To capitalize on the underlying and immense absolute construct in this question is to summarize all survey rationale. If a survey is to serve any purpose in the annals of research, data collection, or decision-making, the use of the reported data must become a baseline from which institutional outcomes are derived. Just as focus groups provide information, or casual conversations result in idea generation, or committees analyze data, synthesize the input, and apply information-based decisions—so surveys must also become a decision-making asset of an organization, inclusive of consistent feedback to participants.

To improve on survey process outcomes, this study has reported scaled results as well as extensive commentary on the perceptions and practices of administrators, faculty members, staff, and IR departments. Within the total dataset and feedback of this research, the study suggested

that to improve data-driven decision-making, the quantity and quality of survey data must each

become a critical component of survey methodologies and outcomes.

References

AACC (American Association of Community Colleges) (2012). *2011 Fact Sheet: Building a Nation of learners by Advancing America's Community Colleges*. Retrieved April 19, 2012, from http://www.aacc.nche.edu/AboutCC/Pages/fastfacts.aspx.

Alwin, D. (1992). Information transmission in the survey interview: Number of response categories and the reliability of attitude measurement. *Sociological Methodology*, *22*, 83-118.

Asiu, B., Antons, C., & Fultz, M. (1998). *Undergraduate perceptions of survey participation: Improving response rates and validity*. Paper presented at the Annual Forum of the 38th Association of Institutional Research, Minneapolis, Minnesota, May 17-20, 1998.

Beebe, T., et al. (2010). Shortening a survey and using alternative forms of prenotification: Impact on response rate and quality. *BMC Medical Research Methodology*, *10*(50), 1-9.

Brynjolfsson, Erik, Hitt, Lorin M. and Kim, Heekyung Hellen, (2011). *Strength in numbers: How does data-driven decision-making affect firm performance?* (April 22, 2011). Available at SSRN: http://ssrn.com/abstract=1819486 or doi:10.2139/ssrn.1819486.

Cohen, A. (2005). Why practitioners and researchers ignore each other (Even when they are the same person). *Community College Review*, *33*(1), 51-62.

Creswell, J. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE Publications: Thousand Oaks, CA.

Digest of Education Statistics. (2010). *Employees in degree-granting institutions, by sex, employment status, control and type of institution, and primary occupation: Selected years, fall 1989 through fall 2009*. National Center for Educational Statistics, Digest of Education Statistics, Table 253 (2010 Tables and Figures). Retrieved August 7, 2011, from http://nces.ed.gov/programs/digest/d10/tables/dt10_253.asp.

Goho, J. (2002). *Mixed mode effects in a community college graduate survey*. Paper presented at the 42nd Annual Forum of the Association for Institutional research, Toronto, Canada, June 2-5, 2002.

HowTo.gov. (2011). *Online surveys*. Retrieved from http://www.howto.gov/customer-service/collecting-feedback/online-surveys-fact-sheet.

Hull, J., & Keim, M. (2007). Nature and status of community college leadership development programs. *Community College Journal of Research and Practice*, *31*(9), 689-702.

Johnson, R., & Owens, L. (2003). Survey response rate reporting in the professional literature.
     American Association for Public Opinion Research – Section on Survey Research
     Methods, 127-133. JSM 2003, Statistics: A Bridge to Knowledge and Discovery, CD
     Table of Contents. Retrieved June 21, 2012, from
     http://www.amstat.org/sections/srms/proceedings /y2003/extras/TOC.pdf.

Jones, J. (1996). The effects of non-response on statistical inference. *Journal of Health and
     Social Policy*, *8*(1), 49-63.

Lipka, Sara. (2011, August 7). Want data? Ask students. Again and again. *The Chronicle of
     Higher Education*, *57*(43), pp. A1-A6, 2p.

McCarthy, S., & Samors, R. (2009, August). *Online learning as a strategic asset. Volume I: A
     Resource for Campus Leaders.* Association of Public and Land-grant Universities:
     Washington, D.C.

Moss, P. A. (1998). The role of consequences in validity theory. *Educational Measurement,
     17*(2), 6-12.

Nair, C., Adams, P., & Mertova, P. (2008). Student engagement: The key to improving survey
     response rates. *Quality in Higher Education*, *14*(3), 225-232.

Perkins, R. (2011). Using research-based practices to increase response rates of web-based
     surveys. *EDUCAUSE Quarterly*, *34*(2), 1-8.

Pett, M., Lackey, N., & Sullivan, J. (2003). *Making sense of factor analysis: The use of factor
     analysis for instrument development in health care research*. Thousand Oaks, CA:
     SAGE Publications.

Porter, S. (2004). Raising response rates: What works? *New Directions for Institutional
     Research*, *2004*(121), 5-21.

Porter, S., & Umbach, P. (2006). Student survey response rates across institutions: Why do they
     vary? *Research in Higher Education*, *47*(2), 229-240.

Porter, S., & Whitcomb, M. (2005). Non-response in student surveys: The role of demographics,
     engagement and personality. *Research in Higher Education*, *46*(2), 127-152.

Radwin, D. (2009, October 5). High response rates don't ensure survey accuracy. *The Chronicle
     of Higher Education: The Chronicle Review*. Retrieved March 3, 2011, from
     http://chronicle.com/article/High-Response-Rates-Dont-E/48642/.

Raosoft, Inc. (2011). Sample size calculator. Retrieved April 16, 2011, from

      http://www.raosoft.com/ samplesize.html.

Sax, L., Gilmartin, S., Lee, J., & Hagedorn, L. (2008). Using web surveys to reach community

      college students: An analysis of response rates and response bias. *Community College*

      Journal of Research and Practice, *32*(9), 712-729.

Seaman, J. (2009, August). *Online learning as a strategic asset. Volume II: The Paradox of*

      Faculty Voices: Views and experiences with online learning.   Association of Public and

      Land-grant Universities: Washington, D.C.

Sheih, D. (2009, February 10). Professors regard online instruction as less effective than

      classroom learning. *The Chronicle of Higher Education: Distance Education*. Retrieved

      March 3, 2011, from http://chronicle.com/article/Professors-Regard-Online-in/1519/.

Tabachnick, B., & Fidell, L. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Pearson

      Education, Inc.

Tashakkori, A., & Teddlie, C. (2003). *Handbook of mixed methods in social and behavioral*

      research. Thousand Oaks, CA: SAGE Publications.

Van Horn, P., Green, K., & Martinussen, M. (2009). Survey response rates and survey

      administration in counseling and clinical psychology. *Educational and Psychological*

      Measurement, *69*(3), 389-403.

Yin, R. (2003). *Case Study Research: Design and Methods* (3rd ed.).   Thousand Oaks, CA:

      SAGE Publications.