ANALYSIS OF SOFTWARE USAGE BY AN R1 UNIVERSITY'S EDUCATION FACULTY, ADMINISTRATORS, AND ACADEMIC STAFF

by

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DISSERTATION

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Approved By:

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Advisor Date

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DEDICATION

To my dedicated and supportive family, Kevin II, Sean, Nikki, and my lifelong partner, Donna. Their unwavering support allowed me to initiate and complete this project.

ACKNOWLEDGMENTS

After two extensions to get this project completed, the final product is ready. At several points in the pursuit of the degree, the process seemed to grind to a halt for one reason or another. Thanks to the support and guidance from my dissertation advisor, Professor Shlomo Sawilowsky and his encouragement, support, and endless depth of knowledge in the fields of educational research and statistics, the completion of the program is at hand. Despite my fondness for the Apple computing platform, we made the project a success and remain friends.

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CHAPTER 1 INTRODUCTION

Technology integration and use in higher education has been extensively studied over the past 25 years, primarily focused on assessing faculty computer literacy, and the integration of technology such as emerging Web 2.0 technologies (Bennett, Bishop, Dalgarno, Waycott & Kennedy, 2012). The focus of many of these studies was also on the integration of technology into teaching, in particular the integration of hardware technology into the curriculum (Nichols, 2011). Although computer literacy of education faculty is an important metric (Bennett et al., 2012), the proper implementation of computing power is dependent on the software used, and to a certain extent, the support for the software packages used. Despite significant outlays to keep technology current and relevant, there is evidence that the technology is not used in intended ways or to full potential (Surry & Land, 2000).

The software needs of faculty and academic staff working at a Carnegie R1, R2, or R3 doctoral institution can be substantial, depending on research needs and administrative duties. Research activities require specialized software, including statistical packages such as SPSS, Minitab, Stata, and SAS that are used in conjunction with data collection and analysis.

Faculty within departments of a college may have specialized software needs. For example, the Microsoft Office Suite package is used for general administrative and support needs, but specialized software is required especially in conjunction with research projects. Many software programs are expensive and frequently require intense training to leverage all aspects of the program to best advantage. Depending on individual skill level, some users may not be using all the robust features of increasingly complex software packages. As the cost of software continues to climb, there is a need to establish if the faculty and staff have the needed software to function effectively and efficiently, as well as to discover what features of the software packages are needed,

as well as which features are frequently used.

Wayne State University

Wayne State University, located in Detroit, Michigan is Michigan's third largest public university, with approximately 28,000 graduate and undergraduate students. As a public research university, WSU through 13 schools and colleges, offers more than 380 programs in a diverse, urban setting in the midtown area of the city. The university has 1,680 faculty members, of which 733 are tenured and 232 are tenure-track. Faculty members generated 84,934 scholarly publications, including 53,116 articles.

Research activity is at a high level, with more than 1,000 research awards annually, and in 2015 research activities produced nearly $188 million dollars in awards. The university holds the Carnegie "Highest Research Activity" designation and is ranked 55th among public universities and colleges, according the FY14 National Science Foundation report.

WSU's College of Education enrolls 2,673 students, including 1,257 full-time and 1,416 part-time students. Full time faculty total 83, with 48 tenured and 35 non-tenured. For 2015, the college's budget was over $10 million, and research awards totaled over $4 million.

Over the past decades, higher education institutions experienced a dramatic shift in how they are funded. State governments, in response to taxpayer concern over funding non-performing universities have reduced state aid, in WSU's case to 20% of the total university budget. Coupled with the decrease in state aid is a call for greater accountability and increased productivity. The rise in awareness that the state's colleges and universities make a significant contribution to the state's economy, in terms of training workers and generating revenue, produced a need for self-evaluation of institutional effectiveness, (Alexander, 2000).

Higher education institutions now face the prospect of outside evaluators or implementing

a system of self-evaluation to measure productivity and efficiency. Not only are student outcomes evaluated, but resource usage such as technology, use of faculty, space, and learning management systems will be assessed for performance metrics. At risk are funding opportunities which are increasingly based on institutional performance metrics (Alexander, 2000).

The administration in the College of Education at Wayne State University has never undertaken an assessment of software needs throughout its four Divisions (Theoretical & Behavioral Foundations, Administrative & Organizational Studies, Teacher Education, and Kinesiology), or performed an inquiry as to the existing software being used effectively and to the extent that all features of a particular package are leveraged to the user's advantage. No study has been done to assess training needs amongst the faculty and academic staff.

Purpose of the Study

Given the importance of determining the high level and specific software needs of a R1 doctoral extensive university, the purpose of this study is to undertake a detailed survey of the faculty and academic staff in the College of Education with the intent to assess if users have the software needed to perform research and administrative tasks. Additionally, the study will be conducted to ascertain which features of software are used, and how software users get technical assistance, and to what extent would users benefit from software training. The results will dovetail into the College's reaccreditation efforts in the form of recommendations regarding future software expenditures, training costs, and software deployment strategies.

Significance of the Study

A review of the literature reveals numerous studies of technology literacy in educators, and the extent to which technology is employed in teaching methods, but according to Surry (2000) "research and practice provide evidence that individuals often do not use the capabilities of

technology in ways intended" (p.146). The findings of this study should be important to College of Education administrators in determining software expenditures in an era of shrinking budgets at Wayne State University, and potentially expanded to encompass other doctoral research colleges education.

Research Questions and Hypothesis

The study will be based on a series of research questions, the main of which are listed below, which will apply separately to faculty and academic staff.

1. What software is available (i.e., installed), and percentage of usage of each program?
2. What specific features of the software are or are not being used? What are the likely reasons for those choices?
3. Where is help with software (e.g., installation, error messages, use of functions) or other software technical assistance obtained?
4. To what extent is software installed in order to complete the (a) research, (b), teaching, and (c) service duties?
5. Do faculty and staff have the support system, (e.g., HELP desk personnel, other IT support personnel) in place when needed?
6. What are the differential needs of administrators, faculty, and academic staff in terms of software?

Definition of Terms

Certain terms used in the study are defined below:

1. *Academic Staff.* Counselors and advisors working in the College of Education, Academic Services Division.

2. *College of Education.* The College of Education within Wayne State University, a four-year institution offering teacher education programs as part of a diverse curriculum.
3. *Faculty.* College of Education employees with a faculty appointment, including full-time and adjuncts, and administrators with a teaching load.

CHAPTER 2 REVIEW OF THE LITERATURE

The purpose of this research is related to the current topic of evaluating how higher education faculty have access to and use technology needed to conduct their teaching and research activities. Over the past several decades, significant funds have been expended yearly by universities and colleges to enhance and support the technology infrastructure within institutions of higher education. As university technology budgets increased over time, many studies assessing the use of technology in the classroom have been conducted, but most focused on the use and effectiveness of technology in the classroom as an enhancement tool for learning outcomes and concentrated on how students and faculty used the emerging technologies. Student use of technology was extensively studied, and over time faculty use of technology and software was studied as part of the student experience.

Few studies were focused exclusively on faculty use of technology, as the present research project intends to carry out. As the stakes rise in the competition for students, talented faculty, and technology resources, an updated study of faculty IT usage and technology needs can provide college and university planners a more accurate view of which technologies and software are used, and how effectively they are employed. Many faculty, as the following literature will show, hesitate at using new and emerging technologies because of a lack of motivation, or a lack of support and training opportunities. The study will provide a needs analysis of the faculty side of the technology question, address issues of technology integration and support, becoming an integral part in program evaluation and analysis of instructional goals for many universities.

Technology and software used by faculty in higher education can come from a variety of sources, with hardware purchased by the individual colleges and major software packages such as Microsoft Office, statistical software such as SPSS, and content management systems, (CMS)

provided to support teaching and research needs. Increasingly, faculty have come to rely on larger collaboration technology products such as Blackboard and other web-based software such as Live Text, for course management and assessment functions. The literature review indicated two main issues in faculty use of technology, one issue related to training in the various technologies available for faculty use, and the adoption of technology by faculty in their everyday activities, either for classroom use or in administrative or research duties.

Providing training for faculty on technology issues is the subject of several research studies. According to Georgina & Olson (2008) over the past several decades, universities have greatly increased technology spending as "the direct result of the movement to increase revenue generated by distance education through online courses" (p.1). As the level of spending increased for technology, a major study conducted by Spotts, (1999) and Novitzki, (2000) attempted to identify different user levels in regard to technology skills, and established a high-level user, medium-level user, and low-level user (Georgina & Olson, 2008). Georgina and Olson also established through survey research that the university should be responsible for training faculty in the use of technology (Georgina & Olson, 2008).

Keengwe, Kidd, & Kyei-Blankson (2009) showed technology was used more for administrative functions in higher education, but less used in the classroom, especially for assessment purposes. While the technology infrastructure at this point in time was taking shape at the college and university level, making the technology available did not mean the faculty would automatically use it effectively without support in the form of training from the administration (Keengwe et al., 2008). To accomplish the goal of providing training and support, "administrators and technology professionals must assess the factors that influence" (p.25) the technology adoption process. There was also an ongoing need to identify potential gaps in technology or the training

process, where "conducting needs assessments will provide data and a methodology for identifying and evaluating the goals identified in the mission, vision, policy, and procedural guidelines of the organization" (p.26). They also believed that utilizing a pre-assessment process to assess the status of the technology infrastructure should lead to an ongoing evaluation process as an assessment of current needs.

Georgina and Hosford (2009) conducted a study which surveyed faculty on proficiency with different aspects of technology and software, attempting to measure proficiency as related to technological literacy. The research showed how faculty, in the absence of organized training, obtained support when faced with learning new technologies. The two favored methods of obtaining help were to form small groups with a trainer to lead them or seek help from a fellow faculty member (Georgina & Hosford, 2009). They found that merely placing technology in place for the faculty to use was not sufficient to build proficiency, the assumption being, "that faculty will learn to use the system(s) to accomplish their instructional needs. It is as though faith in faculty's ability outweigh the reality of learning a new paradigm (Georgina & Hosford, p.690).

In their research on differing support needs for faculty with different levels of proficiency Lane and Lyle (2009) found "in order for institutions of higher education to provide essential technology resources and services, it is vital to gather reliable information about the obstacles the users face" (p.1). Their data showed users with different levels of technical expertise relied on different support mechanisms when seeking help in resolving technology support issues, (Lane and Lyle, 2009). They found numerous surveys on barriers to adopting technology surveyed all users together as a group, with no attempt to draw distinctions between different levels of technical literacy amongst the participants. They maintained that conducting research in this manner caused "the support needs of users with less expertise and the obstacles they encounter can be easily

overlooked" (p.5), due to different user abilities required different types of support.

Kyei-Blankson, Keengwe, and Blankson (2009) found that student expectations of faculty technology proficiency grew with the expansion of the technology infrastructure. In their 2009 study on faculty use of technology, they examined technology use from a student perspective, and investigated how faculty proficiency and use of technology affected student perceptions and performance. They found that, "college administrators and faculty need to focus more on identifying appropriate strategies on faculty integration instead of lobbying for more computer tools in the classroom" (p. 201). To keep pace with student proficiency in technology, instructors need to integrate technology into their courseware and everyday activities, improving their technology comfort level (Kyei-Blankson et al., 2009). They also found that most students expected instructors to be proficient in a wide range of technology and software, ranging from social media tools such as Facebook and Twitter, to course management software such as Blackboard (Kyei-Blankson et al., 2009). Additionally, the research concluded, "evaluation of faculty use of technology in instruction is necessary to provide valuable feedback to educators and administrators regarding effective technology integration in teaching and learning (p. 211).

The integration of technology into universities and colleges continued to grow, having surpassed $5.2 billion dollars in the 2003 – 2004 academic year (Yohon & Zimmerman, 2006). Yohon and Zimmerman (2006) studied issues in faculty adoption of technology in their teaching and research activities. With universities and colleges differing in terms of mission goals, and organization their research looked at the various different types of software used and how faculty approached opportunities to implement technology in their coursework. A low rate of technology adoption by faculty was found, with the lack of support given as the principal reason for this finding. Also, the surveyed faculty indicated not only a desire for technology support but indicated certain

preferences in the ways to obtain that support, preferring face to face support over alternate means, such as web-based tutorials or telephone support. A need for more research was identified:

> to ascertain the barriers to faculty's adoption of information technologies, to determine what factors successfully encourage adoption of information technologies for teaching, and what faculty training and promotional programs best encourage faculty adoption of information technology for teaching. (p. 24)

Earlier research from 2000 pointed to advantages gained by the early adoption of technology by the faculty of universities. Administrators grappling with decreasing budgets and increasing competition from other colleges and universities viewed the adoption of technology as a way to mitigate a variety of problem areas, "such as decreases in state fiscal support, increases in non-traditional students, increased (often technology-based) competition, and increased faculty/student ratios" (Surry & Land 2000, p.152). Faculty motivation to use technology needs to be increased if faculty usage rates of technology are to be increased. The motivation to use technology is a recurrent theme throughout the literature, and Surrey and Land (2000) offered several frameworks based on Keller's four categories of motivation as possible solutions to the problem. The importance of establishing a motivational framework according to Surrey & Land is paramount "to increase the utilization of technology on campus, administrators will have to understand technological change from the faculty's perspective and develop strategies for encouraging faculty to use technology" (p. 149).

Discussing the use of educational technology at a medical university, Kazley, Annan, Carson, Freeland, Hodge, Seif, and Zoller (2013) wrote, "research on technology use in academic settings often attempts to identify how technology is being used and the extent of use" (p.64), which did not identify faculty uses of technology and software, although it was also the topic of the

majority of the topics found in the literature. Their study was an attempt to identify differences in technology use between faculty and students. Using survey and focus group techniques, the researchers were able to form a better understanding of how students and faculty regarded their competency level as technology users, with students more likely to consider themselves average users. The data gathered from the study was "used to make some decisions regarding training and support in order to improve technology adoption" (Kazley et al., 2013, p.68). The study was a departure from the others composing the bulk of the literature, in the respect that faculty and students were surveyed separately, in an attempt to assess the technology needs of each group individually, "since the staff, faculty and students may use the technology tools in very different ways" (p. 69). Their study concluded with a call for additional survey research to gather more data on faculty use and needs in teaching and administrative areas.

Zoellner, Hines, Keenan, & Samson (2013) examined how faculty used several aspects of technology in research and publishing. They found the "study participants used computers for all stages of the research, writing, and publication process. Some scholars used add-ons, including iPhone, iPad, and Kindle, and lauded the technologies for making their work portable" (p.121). In contrast with participants in earlier studies, faculty integrated several technologies into their work environment, changing the nature of their work processes. Despite this ease of integration by the study participants, Zoellner et al. (2013) identified several technology challenges, some related to support, which are recurring through the literature:

> The challenges vary by individual, however. Interviews indicated four main differences: finding a match between the technology and faculty members' preferred research practices; overcoming the learning curve and gaining the needed assistance; compatibility, interoperability, and software stability; and financial support. (p.122)

They showed that faculty moved their research along in different ways, utilizing different technologies and work practices. A better understanding of the processes could be developed with further survey research (Zoellner et al., 2013).

Guidry, K., & A. B (2010) conducted survey research that presented several questions to participants in regard to their use of technology two of which asked:

1. How often do faculty report using academic technologies?
2. Do faculty in different disciplines use these technologies more or less than their peers?

The research is starting to address directly the issues of faculty and their use and nonuse of technology in teaching and research. Survey data surveyed that education faculty were leaders in the adoption and use of technology in teaching (Guidry, K., & A. B, 2010). The data also showed that all faculty used course management systems, such as Blackboard or Live Text as the technology of choice. A recommendation for future research was made to "explore relationships between disciplines and personal and institutional characteristics. Moreover, future studies employing different methods may be able to expose causation – why particular disciplines use (or do not use) particular technologies" (p.20). They called for ongoing research "along the same lines of this study will always be necessary simply to explore the uses of new technologies as they become available and grow in popularity (for example, microblogging, location-aware mobile technologies, and tablet computers)," (p. 20).

As shown in the literature review, studies examined the use of technology in the classroom by faculty in teaching courses, with varying levels of implementation. Student attitude and use of technology for the past several decades has been studied as well, especially as technology budgets and expenditures have increased. The technology infrastructures in universities and colleges have been in place for several years, and have gone through myriad upgrades, especially in the

implementation of wireless and mobile technologies. Survey research needs to be focused more closely on the end user, the faculty, to effectively ascertain what is working and what needs are still existing in the technology realm. As Zoellner et al., wrote "further research might focus on a specific department or include a larger sample of professors from each department; narrow to cover one work practice in depth" (p. 128), which would provide a more detailed analysis of technology trends within the university, providing a tool for planners and administrators.

CHAPTER 3 METHODOLOGY

Over the past several decades increasing amount of funds have been devoted to the acquisition or maintenance of technology assets in higher education colleges and universities. Technology assets have come to include computer hardware, such as monitors and computer processing units (CPUs), printers, scanners, personal digital assistants, (PDAs), tablets and software. The software components range from web-based tools such as Blackboard, to desktop software such as Microsoft Office 360 Suite for word processing and spreadsheet creation. Research applications often require specialized statistical analysis packages such as SPSS, Stata, or MiniTab. As the technology asset mix increasingly involves more complex hardware and software, issues of technology support have become more important to ensure the effective use of technology by university faculty and academic staff.

The purpose of this study is to determine how faculty and academic staff use technology in conjunction with their research and daily work activities, with intent to assess future technology needs and to develop strategies to improve technology support. This will be accomplished by creating, administering, and analyzing a comprehensive survey instrument, delivered to an accessible group of college of education faculty and academic staff. The survey will be in the form of a questionnaire, delivered via an internet-based survey website. Data will be collected through the administration of the survey and analyzed using appropriate quantitative statistical procedures.

The study will be based on a series of research questions, the main of which are listed below, which will apply separately to faculty and academic staff.

7. What software is available (i.e., installed), and percentage of usage of each program?
8. What specific features of the software are used (i.e., percentage), and which specific features are not being used (percentage)

9. Where is help with software (e.g., installation, error messages, use of functions) or other software technical assistance obtained?
10. To what extent is software installed in order to complete the (a) research, (b), teaching, (c), service, duties?
11. The assumption is that faculty and staff have the support system, (e.g., HELP desk personnel, other IT support personnel), in place when needed. Is this assumption correct?

Study Site

The *Education Technology Center* is a department within the College of Education at Wayne State University, established to assist college students, faculty and staff in the acquisition, integration, and use of technology in instructional delivery, administrative functions, and research activities. The services provided by the Education Technology Center are:

1. Acquisition and deployment of technology assets throughout the College, for use by students, faculty and staff. Technology assets include computer hardware and software, along with associated peripheral items such as scanners and printers.
2. A second responsibility is to provide assistance in selection and application of technology in support of faculty research activities and instructional delivery.
3. A third responsibility is to provide the facilities in which college researchers, including faculty, staff or students can accomplish computing tasks necessary for research.
4. A fourth responsibility of the Center is to provide the technology support for the college, including technology hardware and associated software packages used throughout the college divisions.

Population

The population for the study is the entire full-time and adjunct faculty and academic staff of Wayne State University. Due to administrative restrictions, access to the population of the entire university is not attainable; therefore, a smaller target population will be utilized. The targeted population of the study is the faculty and academic staff, numbering approximately 150 members, full and part time of the College of Education within Wayne State University. The academic staff carries out their duties entirely within the Education Building. The faculty is comprised of full time and adjunct members located on the main campus or at the Oakland and Macomb satellite centers. Main campus faculty is located in several buildings other than the Education building, depending on their discipline.

Instruments

Data for the survey will be collected via a questionnaire to be developed that will be located on the Qualtrics.com web survey site. Participants will be given a hyperlink to access the document and will use their Wayne State University access ID and password to gain access to the questionnaire. The survey will be completed once, with the participant's responses recorded to prevent multiple submissions by a single respondent. Respondents will be able to access the survey using desktop and laptop computers, as well as tablet devices. Design considerations, limiting excessive scrolling and zooming, will take into account for accommodating smartphones, since people are increasingly using these devices in place of computers (Ruel, Wagner, & Gillespie, 2016).

The data will be collected and archived on the Qualtrics site, with access to the data file restricted to the primary researcher. The survey instrument will be an internally created questionnaire survey, developed based on faculty and academic staff input and Education

Technology Center records concerning technology purchases and requests for technology support through the Center and the target population over the past several years. Approximately 35 – 50 closed and open-ended questions will be developed based on the type of technical support requested from the Center by the faculty and academic staff, with multiple choice and short answer style questions used. Closed ended questions will be constructed around a 5-point Likert scale. Before the instrument will be implemented, a planned pilot study with a randomly selected group from the targeted population will be conducted to test the instrument's reliability and internal validity (Fraenkel, Wallen, & Hyun, 2015).

Survey Reliability

The survey responses will be transferred into SPSS, and a reliability study will be conducted. Cronbach alpha, a measure of internal consistency reliability, will be computed. Descriptive statistics will be obtained on both the item and total scale. Reliability estimates will be examined using the item deletion approach to determine the contribution of each item.

Design and Procedures

The purpose of the survey is to investigate how technology users (the target population) obtain technology assets and which technology components, especially software are needed to accomplish their duties as researchers, faculty members, and academic advisors. Also, the methods in which the respondents used to obtain technology support will be examined. The questionnaire will be designed so that it may be completed within a 20-minute time period, to mitigate participant dropout from excessive time required to complete the questionnaire. Administering the survey a single time will mitigate threats posed to the survey by the extraneous variable of testing.

All participants will be emailed a cover letter of consent requesting their participation in the study. The cover letter will explain the purpose of the survey, request the participant's cooperation,

and indicate the intention of sharing the results of the study. The privacy and confidentiality of the participant will be built into the study. Through random number generation, the participant's identity will not appear on any of the survey materials. Administration of the survey and data collected will remain anonymously identified, with data storage and security provided by the Qualtrics survey website, protected by a single sign-on username and strong encryption password protection algorithm. Respondents agreeing to participate will click on a hyperlink to enter the survey study site and will have 10 days to complete the survey. Alternatively, if choosing not to participate, the respondent will click on a link declining participation and the nonresponse will be recorded.

Dependent Variables

The survey subscales and total scores represent the outcome variables.

Independent Variables

Those who respond to the survey will be code as (a) job classification (administrator, faculty, or academic staff), (b) if faculty, status (tenure/tenure track or not tenure/tenure track) and College Division (Administrative and Organizational Studies, Kinesiology and Health Sciences, Teacher Education, or Theoretical and Behavioral Foundations), and rank (professor, associate professor, assistant professor, instructor, adjunct faculty).

Data analysis

After importing the data from Qualtrics into SPSS, descriptive statistics will be obtained for individual items, and for the total survey. The descriptive statistics will be broken down by the independent variables of job classification, faculty status, faculty rank, and College Division. A Kolmogorov-Smirnov test, and normality plots, will be obtained for the response to the survey.

If the normality assumption holds, a series of one-way ANOVAs will be conducted on

survey responses for each of the independent variables, with Bonferroni corrected independent samples t tests applied when there are more than two levels of the independent variables. If the normality assumption is violated, the nonparametric Kruskal-Wallis test will replace the F tests, and the Wilcoxon Rank Sum test will replace the t tests. Nominal α will be set to 0.05 for all statistical analyses.

Limitations

The study is susceptible to several limitations. Because the questionnaire will be administered via the Internet, there will be no face-to-face contact, increasing the chances of nonresponse on the part of the participants. Through careful construction of the survey with clear and simple questions, assuring participants of confidentiality, and re-contacting participants as necessary, are all ways to control for the extraneous effects of this variable. Pretesting the survey questionnaire with a small representative group is a method used to improving the nonresponse variable. (Ruel, Wagner & Gillespie, 2016).

The small size of the target population introduces another extraneous variable, which produces a threat to the external validity of the project and may prove to be difficult to control for or mitigate altogether. This threat to generalizability happens because of the restriction of the study group to the college of education, rather than the entire university. The restriction to the College of Education will obviate generalizing the results of the study to a larger population.

The threat posed by mortality could also pose a limitation, although this threat is mitigated by the fact that the survey is administered one time and within a specified 10-day time frame, unlike a longitudinal survey administered several times over a length of time.

The study could also be affected by history, in particular an unanticipated event occurring prior to a respondent's completion of the questionnaire, such as the passage of time between a

respondent's need for technical assistance and the arrival of the survey instrument before technical support was obtained, affecting the respondent's mood and disposition. A method to remedy this limitation would be to provide a survey link to faculty and academic staff on the completion of any technical support issues completed or addressed by the Center, collecting data on the completed support issue while still fresh in the client's memory.

CHAPTER 4 RESULTS

A 30-item survey instrument was distributed to the target population via email on July 22, 2018. Since the new academic year did not start until August 16, 2018, a reminder email to participate in the survey was sent on September 28, 2018. The survey closed on September 30, 2018. The population for the study is the entire faculty and academic staff in Wayne State University, but due to administrative logistical restrictions, a selected target population from the College of Education was developed. The target population consisted of 235 College of Education faculty, administrators, and academic advisors, of which a sample size of 100 (42.5%) responses were recorded. The sample responses were broken down as Administrators, n = 6 (66.7%), Academic Advisors, n = 7 (77.7%), Full Time Tenure Track Faculty, n = 35 (74.4%), Full Time Non-Tenure Track Faculty, n = 28 (65.1%), and Part-Time Faculty, n = 24 (44.4%).

Demographics

The study was conducted to answer six research questions: (1) What software is available, and percentage of usage of each program?, (2) What specific features of the software are or are not being used?, (3) Where is help with software or other software technical assistance obtained?, (4) To what extent is software installed in order to complete research, teaching, and service duties?, (5) Do faculty and academic staff have the support system in place when needed?, and (6) What are the differential needs of administrators, faculty, and academic staff in terms of software? An online survey was developed and distributed to answer the research questions. Survey participants were invited to participate through an invitational email requesting their voluntary participation in the project. Participants were presented with 29 questions, 4 questions for classification purposes, 1 Likert scale question used to assess software proficiency, and 24 open ended questions.

The breakdown by job classification is compiled in Table 1 and Figure 1 below. The

majority of respondents were full time faculty.

Table 1

Job Titles of Survey Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Administrator	8	8.3	8.3	8.3
	Full Time Faculty Tenure	35	36.5	36.5	44.8
	Full Time Faculty Non-Tenure	22	22.9	22.9	67.7
	Part Time	23	24.0	24.0	91.7
	Academic Advisor	8	8.3	8.3	100.0
	Total	96	100.0	100.0	

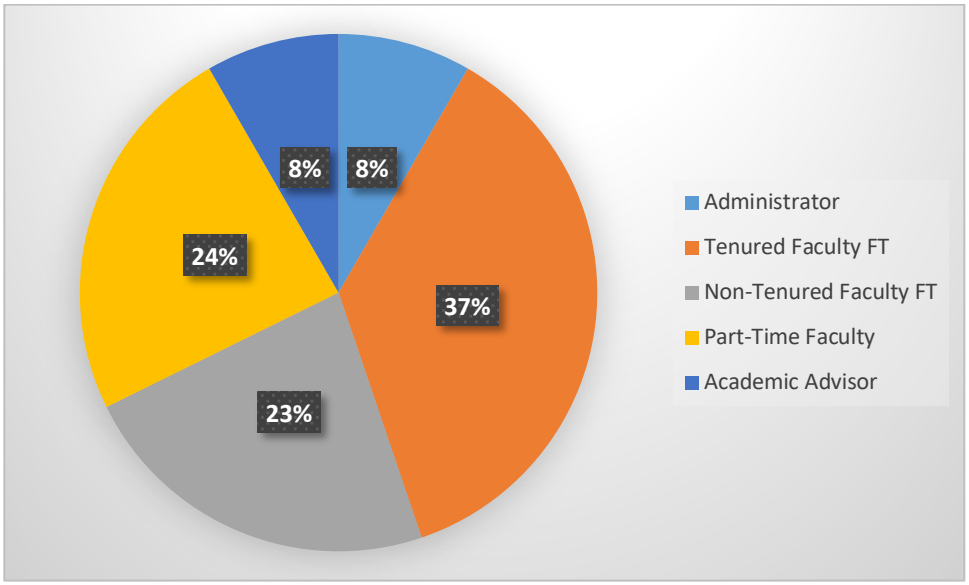

Figure 1. Distribution of job titles among survey participants.

Survey responses delineated according to the computer platform used, operating system used, and preferred operating system are presented in Table 2 and Figures 2 and 3.

Table 2

Computer platform and Operating Systems

Computer Platform	Desktop	Laptop	Tablet	Smartphone
	62 (64.6%)	84 (87.5%)	24 (25%)	37 (38.5)
Current Operating System	Windows 10	AppleOS	LinuxOS	Other
	58 (60.4%)	37 (38.5%)	1 (1.0%)	0
Preferred Operating System	Windows 10	AppleOS	LinuxOS	Other
	49 (51%)	36 (37.5%)	2 (2.1%	1 (1%)

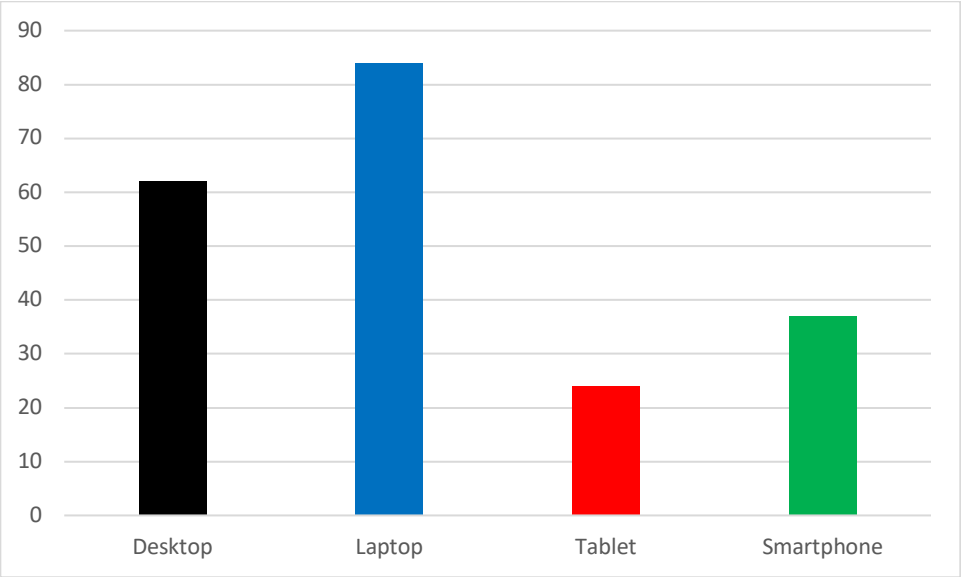

Figure 2. Distribution of computing platforms among survey respondents.

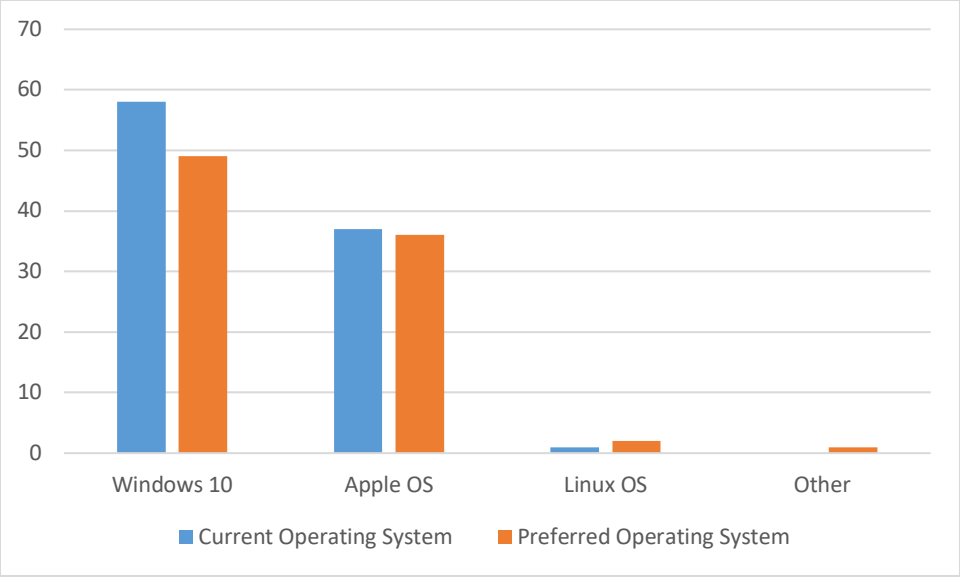

Figure 3. Graph of current computer operating systems in use vs. preferred computer operating systems.

A 2×3 chi-squared test on current vs. preferred operating system (with the unnamed other category removed) was not statistically significantly different (chi-squared = 0.663, df = 2, p = .718).The specific tasks performed by the respondents is presented in Table 3 and Figure 4. A one sample chi-squared test indicated there was no statistically significant difference in job tasks (chi-squared = 6.17, $df = 4$, $p = 0.19$).

Table 3

Tasks Performed by Respondents

Research 71 (74%)	Teaching 83 (86.5%)	Writing 59 (61.5%)	Job Duties 86 (89.6%)	Advise Students 78 (81.3)

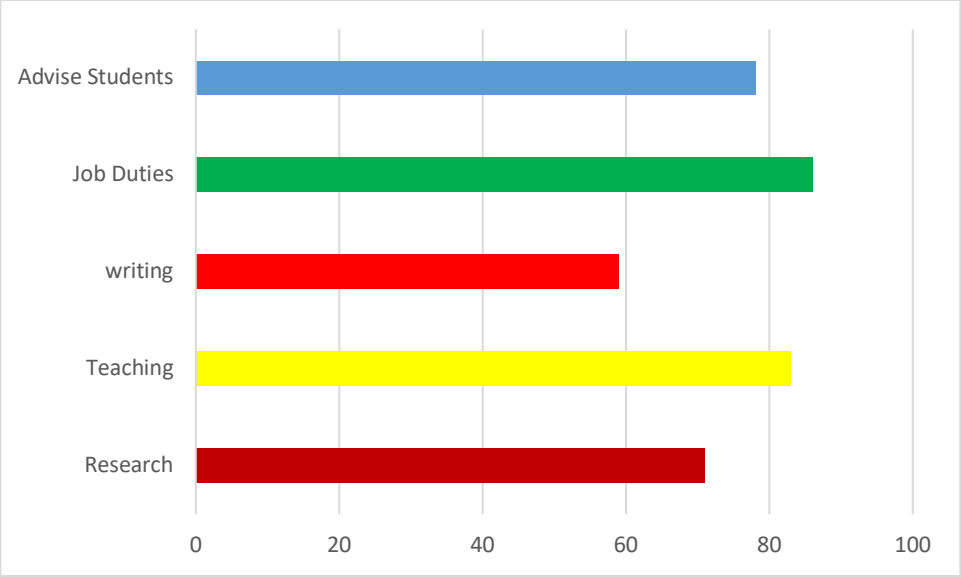

Figure 4. Distribution of job tasks among survey respondents.

Word processing software usage by respondents is reported in Table 4 and graphically in Figure 5. Approximately 90% use MS Word. It may be interesting to track the use of cloud-based or open source word processing software (e.g., Google Docs) in the future. Software used to create and perform work in spreadsheets is reported in Table 5.

Table 4

Word Processing Software Used

Type	%
MS Word 86	89.6
Google Docs 9	9.4
Open Source WP 1	1

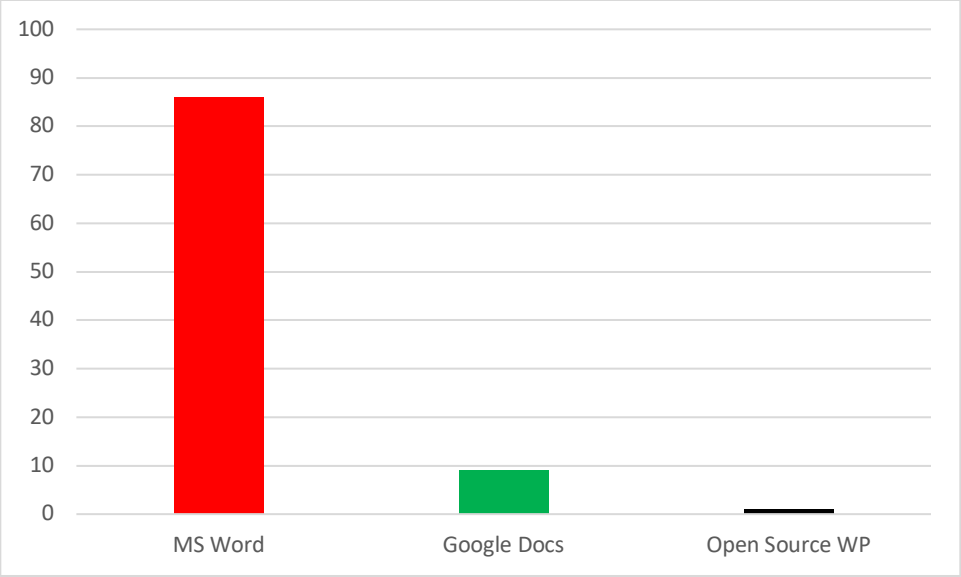

Figure 5. Word processing software used by survey respondents.

Table 5

Spreadsheet Software Used

Software	Usage
Excel	80 (83.3%)
Google Sheets	6 (5.3%)
Apple Numbers	1 (1%)

Similarly, it may be of interest to track cloud-based or open source spreadsheet software in future use. Presentation software used by respondents is reported in Table 6 and Figure 6.

Table 6

Presentation Software Used

Software	Usage
MS PowerPoint	85 (88.5%)
Apple Keynote	1 (1%)
Google Slides	1 (1%)
Prezi	1 (1%)
OpenOffice Presentation	1 (1%)

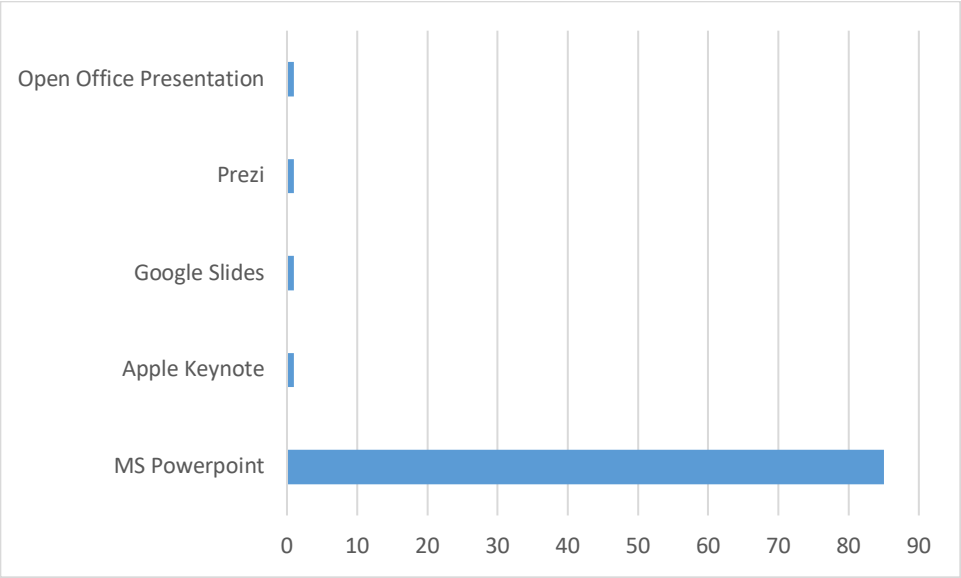

Figure 6. Presentation software used by survey respondents

Microsoft PowerPoint is the dominant presentation software. Again, tracking the cloud-based or open source software such as Google Slides may be informative in a future study. Software used to perform data analysis tasks is reported in Table 7 and Figure 7. Approximately 70% of data analysis is performed on quantitative software, with the remaining 30% performed on qualitative software.

Table 7

Software Used to Perform Data Analysis Tasks

Software	Usage
SPSS	31 (32.3%)
NVivo	15 (15.6%)
Minitab	3 (3.1%)
Stata	1 (1%)

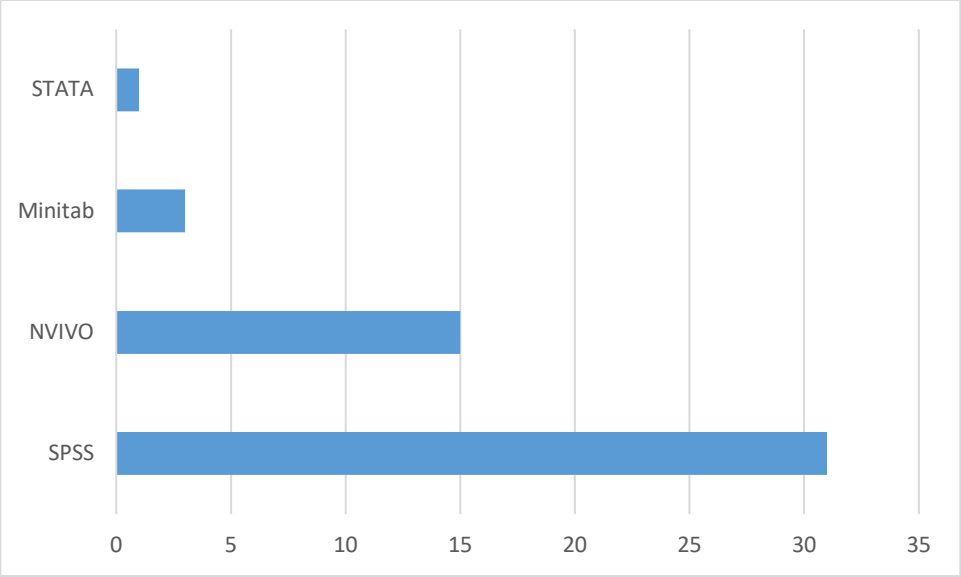

Figure 7. Software used for data analysis by survey respondents.

In addition, respondents were permitted to list specialty software used, which included the following listed in Table 8:

Table 8

Specialty Data Analysis Software Used

Software	N	%
Excel	1	7.14
Fortran	1	7.14
Amos	1	7.14
Iteman	1	7.14
SAS	1	7.14
AtlasTi	1	7.14
mPlus	1	7.14
Lisrel	1	7.14
Thematically	2	14.29
PSPP	1	7.14
R	2	14.29
Python	1	7.14
Total	14	100

To determine if certain software packages had features needed by the respondents, a series of 1 df Chi-squared tests were conducted on responses to the adequacy of the feature set in three

different types of software. The results are compiled in Table 9. A 3 × 2 Chi-squared test indicated the adequacy of feature set is independent of type of software (Chi-squared = 4.78, *df* = 2, *p* = 0.09.)

Table 9

Software Features Adequate

	Yes	No	Chi-Squared	*p*
Spreadsheet	79 (91.9%)	7 (8.1%)	58.62	.0001
Presentation	80 (90.9%)	8 (9.1%)	57.28	.0001
Data Analysis	36 (80%)	9 (20%)	15.02	.0001

Table 10 and Figure 8 shows there were n = 45 (48.9%) who reported they have software needed to process .pdf documents, n = 17 (17%) did not know if they had the software, and n = 17 (17%) indicated they did not know if they had the software, but they were aware they needed it.

Table 10

Need for PDF Software

PDF Software	N
Have Software	45 (48.9%)
Do Not Know	17 (17%)
Do Not Know/Have Need	17 (17%)

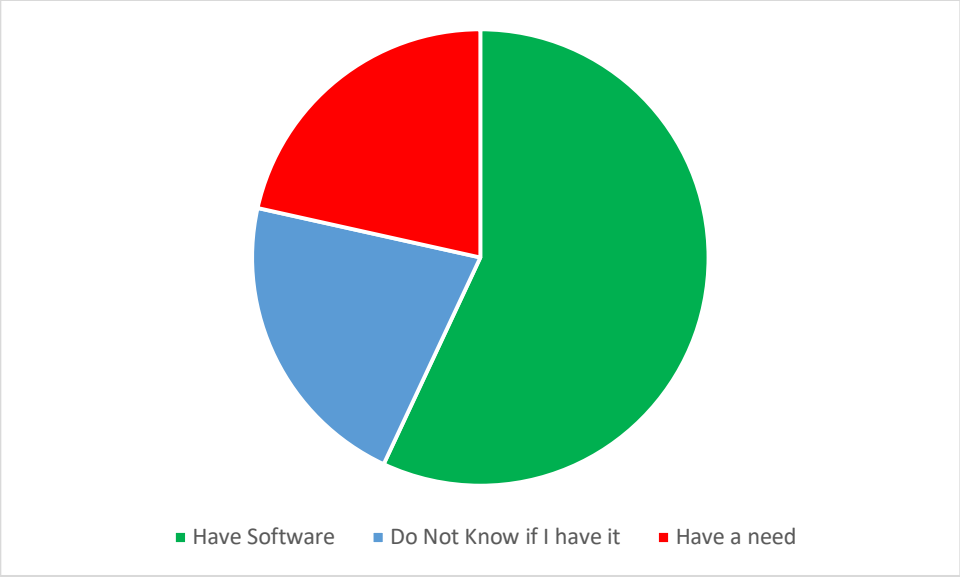

Figure 8. Respondents need for PDF software.

Reported in Table 11 and Figure 9 are survey results showing thirteen respondents (13.5%) indicated they have appropriate online software and there were n = 37 (38.%) who reported they needed software for online course development. There were 36 (37.5%) who indicated they were not involved in developing online content.

Table 11

Need for Online Course Software

Online Course Software	N
Have Software	13 (13.5%)
Needed Software	37 (38%)
Do Not Need	36 (37.5)

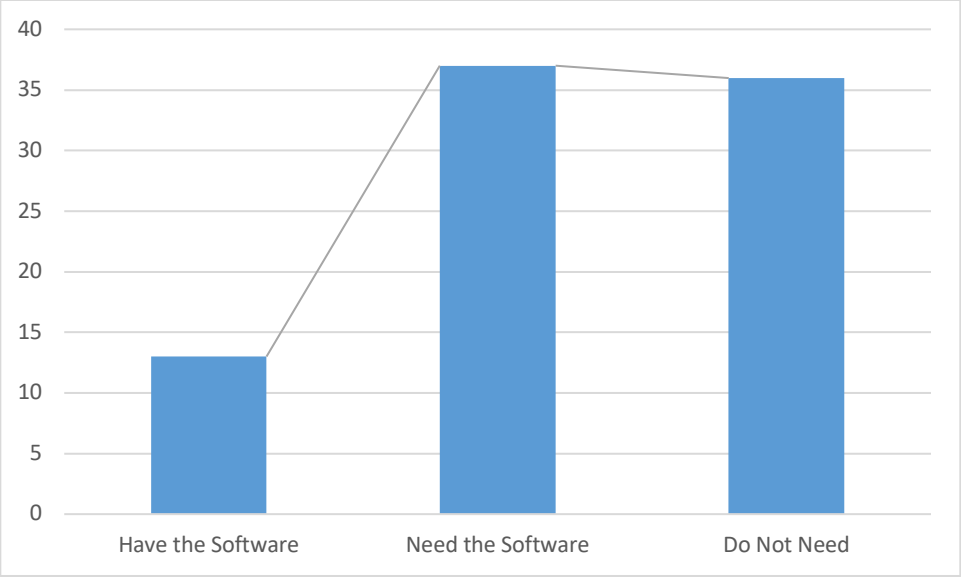

Figure 9. Respondents need for online course software.

Shown in Table 12 are the number of respondents using online course development software, which included 5 (5.2) using Camtasia and 2 (2.1%) using CANVAS.

Table 12

Online Course Software Used

Online Course Software Used	N
Camtasia	5 (5.2%)
Canvas	2 (2.1%)

Respondents indicated they needed online course development software were n = 37 (38%), with n = 16 (16.7%) Camtasia, and 1 (1%) each for Adobe Creative Suite, Adobe Creative Cloud, and Adobe Connect. These results are reported in Table 13 and Figure 10.

Table 13

Online Course Development Software Requested

Online Course Software Requested	N
Camtasia	16 (16.7%)
Adobe Creative Suite	1 (1%)

Adobe Creative Cloud	1 (1%)
Adobe Connect	1 (1%)
No Preference	19

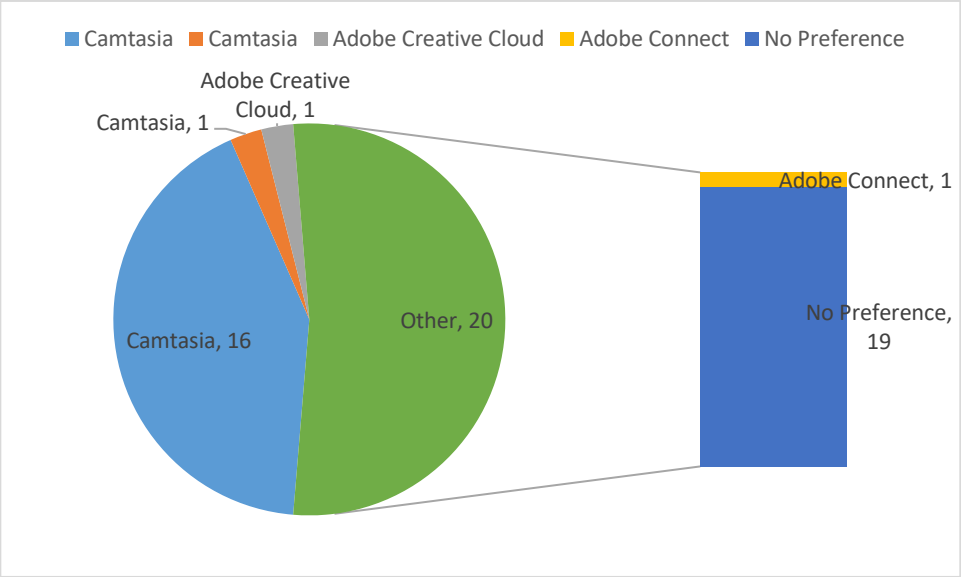

Figure 10. Online course development software requested.

There were n = 6 (6.3%) respondents who indicated they use graphic software, all of whom indicated it was Adobe Creative Suite. There were n = 43 (44.8%) who indicated they did not need graphic software. These results are listed in Table 14 and Figure 11.

Table 14

Graphic Software Used

Graphic Software Used	N
Adobe Creative Suite	6 (6.3%)
Do Not Need	43 (44.8%)

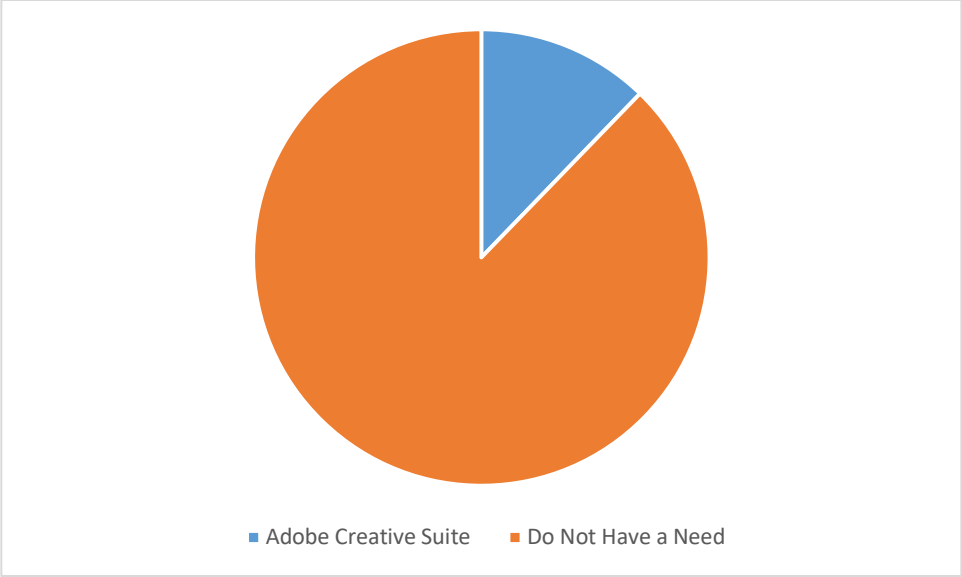

Figure 11. Graph of graphic software used by respondents.

Listed in Table 15 and Figure 12 are the twenty-two (22.9%) who indicated they needed graphic software, including Creative Suite (14, 14.6%), Photoshop (6, 6.3%), Illustrator (1, 1%), Creative Cloud (1, 1.0%).

Table 15

Graphic Software Requested

Graphic Software Requested	N
Adobe Creative Suite	14 (14.6%)
Adobe Photoshop	6 (6.3%)
Adobe Illustrator	1 (1%)
Adobe Creative Cloud	1 (1%)

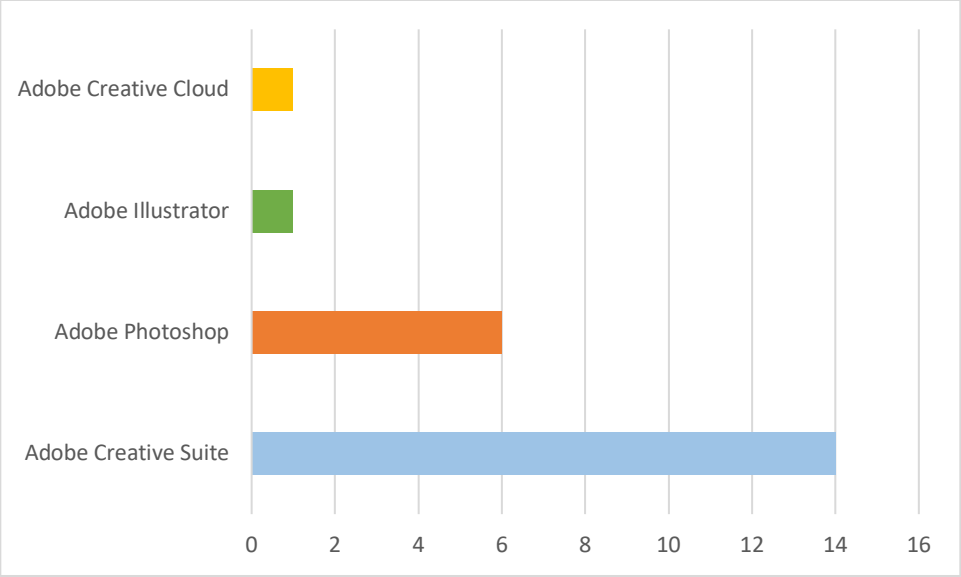

Figure 12. Graphic handling software requested by survey respondents.

There were N = 96 responses to the survey. Q28 pertained to self-rating of confidence regarding specific software packages (0 = not proficient to 3 = very proficient). Cronbach's alpha (CA), a measure of internal consistency reliability, was based on n = 49 (51%) of the respondents who had no missing values. (Respondents with missing values were list-wise deleted.) Cronbach's alpha for this eight-item scale was CA = .806, which is very high considering the small number of items. The overall mean for this scale was (standard deviation) was 14.86 (4.26).

Item statistics are compiled in Table 16 below. Item-total statistics are presented in Table 17. The rightmost column of this table indicates "Cronbach's Alpha if Item Deleted." If any entry was less than CA = .806, that item would be a candidate for deletion to improve the reliability of the scale. Note there were no such candidates for removal.

Table 16

Item Statistics Compiled from Self-Rating Scale

	Mean	Std. Deviation
Operating System proficiency	2.08	.786
Word Processing proficiency	2.49	.649
Spreadsheet proficiency	1.94	.944

Presentation proficiency	2.43	.677
Data Analysis proficiency	1.67	.899
.pdf Document proficiency	1.84	.800
Online Course proficiency	1.43	.842
Graphic handling proficiency	.98	.901

Table 17

Item-Total Statistics Compiled from Self-Rating Scale

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Operating System proficiency	12.78	14.219	.561	.778
Word Processing proficiency	12.37	14.654	.622	.774
Spreadsheet proficiency	12.92	13.077	.615	.768
Presentation proficiency	12.43	15.417	.431	.796
Data Analysis proficiency	13.18	14.695	.387	.805
.pdf Document proficiency	13.02	13.770	.633	.767
Online Course proficiency	13.43	14.375	.483	.789
Graphic handling proficiency	13.88	14.151	.472	.792

Because some areas of proficiency may not be applicable to all respondents (e.g., a respondent may not use spreadsheet software), a Proficiency total score is not appropriate. Instead, the mean Proficiency will be used, which is computed on the basis of the sum of the Likert scale responses for those software packages used, divided by the number of software packaged used. Based on n = 86, the mean (median) score was 1.91 (1.94), and standard deviation was .59 on the zero (not at all) to three (very) proficiency rating scale.

A one-way ANOVA conducted on mean proficiency by role in the College (i. e., Academic Advisor, Administrator, Full Time Faculty Non-Tenure Track, Full Time Faculty Tenure Track, Part Time Faculty) indicated there was no statistically significant difference (F = 1.62, df = 4, 85),

p =.177, the results reported in Table 18.

Table 18

ANOVA Table of Average Proficiency

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.196	4	.549	1.621	.177
Within Groups	27.426	81	.339		
Total	29.622	85			

Shown in the following tables are the various sources for support of software related technical problems. Listed in Table 19 and Figure 13 are the sources for support involving software installations on faculty computers. The majority of respondents, 51%, seek assistance from the Education Technology Center, ETC, located within the college. Of note is the 17% seeking help through Google searches or other Self-Help portals.

Table 19

Sources of Software Installation Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ETC	51	53.1	63.7	63.7
	WSU Help Desk	9	9.4	11.3	75.0
	Colleagues	2	2.1	2.5	77.5
	Vendor Web Site	1	1.0	1.3	78.8
	Google/Self-Help	17	17.7	21.3	100.0
	Total	80	83.3	100.0	

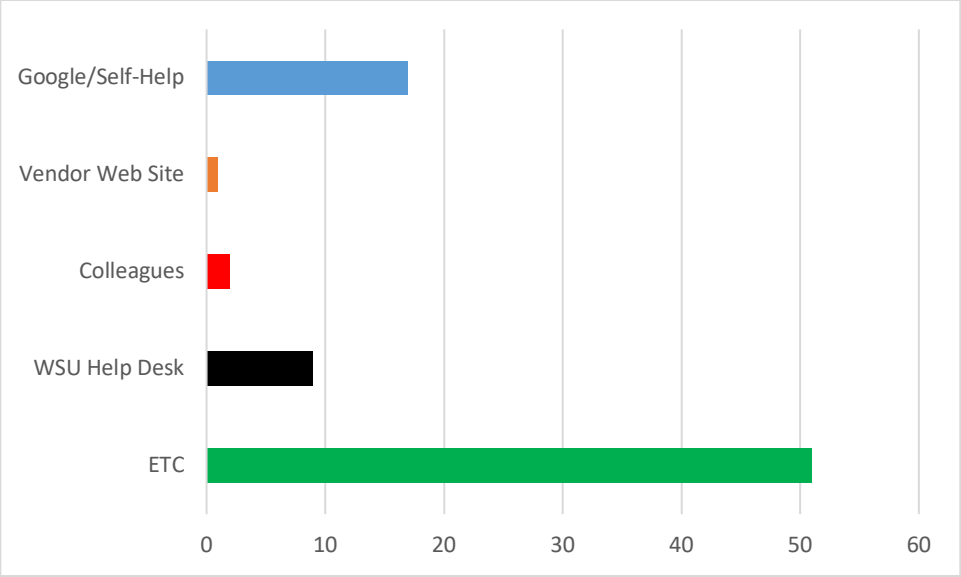

Figure 13. Sources for software installation support.

Shown in Table 20 and Figure 14 are sources for support regarding the computer operating system. The ETC is the major sources for this type of support, at 47%.

Table 20

Sources of Operating System Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ETC	47	49.0	58.0	58.0
	WSU Help Desk	11	11.5	13.6	71.6
	Colleagues	5	5.2	6.2	77.8
	Vendor Web Site	2	2.1	2.5	80.2
	Tech Forums	1	1.0	1.2	81.5
	Google/Self-Help	15	15.6	18.5	100.0
	Total	81	84.4	100	

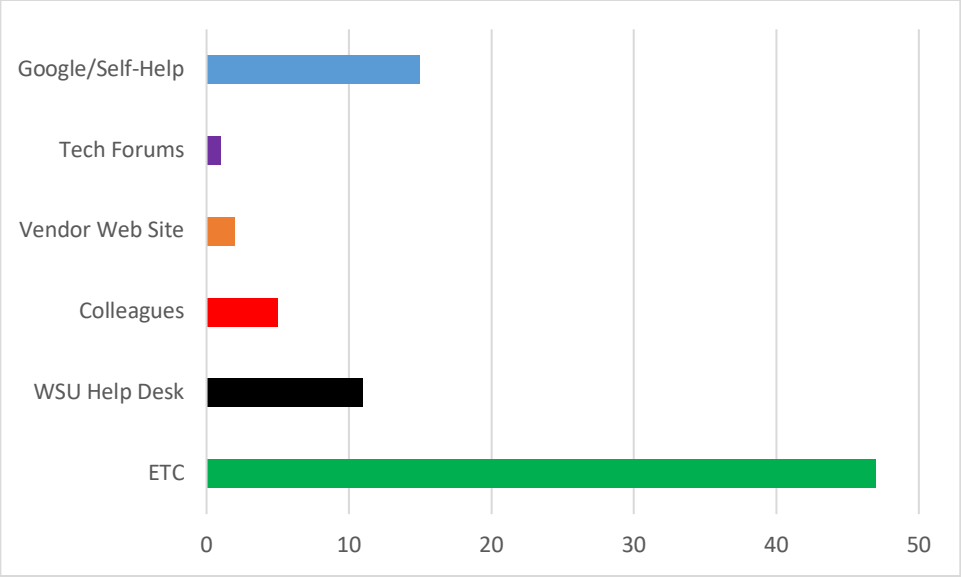

Figure 14. Sources for computer operating system support.

Sources for word processing support are listed in Table 21and Figure 15. Google searches and self-help routines are the majority sources at 39%.

Table 21

Sources of Word Processing Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ETC	20	20.8	24.7	24.7
	WSU Help Desk	6	6.3	7.4	32.1
	Colleagues	11	11.5	13.6	45.7
	Vendor Web Site	2	2.1	2.5	48.1
	Tech Forums	3	3.1	3.7	51.9
	Google/Self-Help	39	40.6	48.1	100.0
	Total	81	84.4	100	

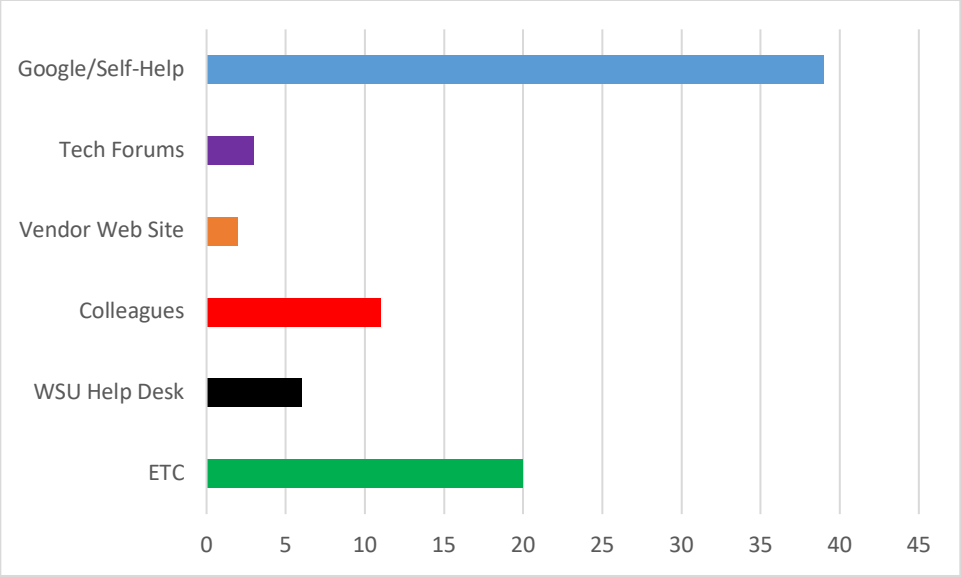

Figure 15. Sources for word processing software support.

Shown in Table 22 and Figure 16 are the sources accessed to obtain assistance with spreadsheet software. The majority of respondents utilized Google/Self-Help, at 39%.

Table 22

Sources of Spread Sheet Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ETC	11	11.5	13.8	13.8
	WSU Help Desk	7	7.3	8.8	22.5
	Colleagues	19	19.8	23.8	46.3
	Vendor Web Site	2	2.1	2.5	48.8
	Tech Forums	2	2.1	2.5	51.2
	Google/Self-Help	39	40.6	48.8	100.0
	Total	80	83.3	100	

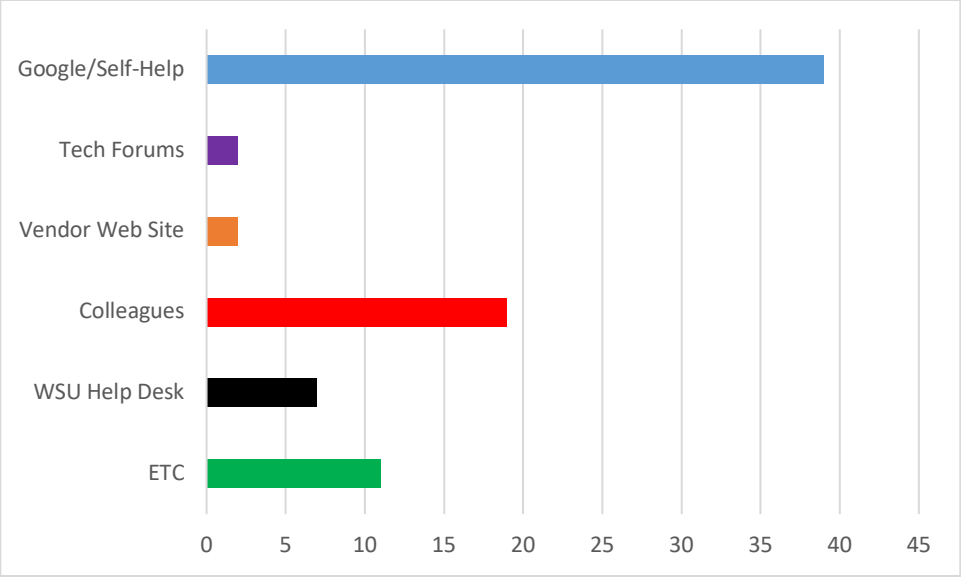

Figure 16. Sources for spreadsheet software support.

Figure 17 and Table 23 list the sources used to obtain support for presentation software. Once again, respondents chose the Google/Self-Help options, at 39%, as the preferred method of obtaining software support.

Table 23

Sources of Presentation Software Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ETC	14	14.6	17.7	17.7
	WSU Help Desk	6	6.3	7.6	25.3
	Colleagues	15	15.6	19.0	44.3
	Vendor Web Site	2	2.1	2.5	46.8
	Tech Forums	3	3.1	3.8	50.6
	Google/Self-Help	39	40.6	49.4	100.0
	Total	79	82.3	100.0	

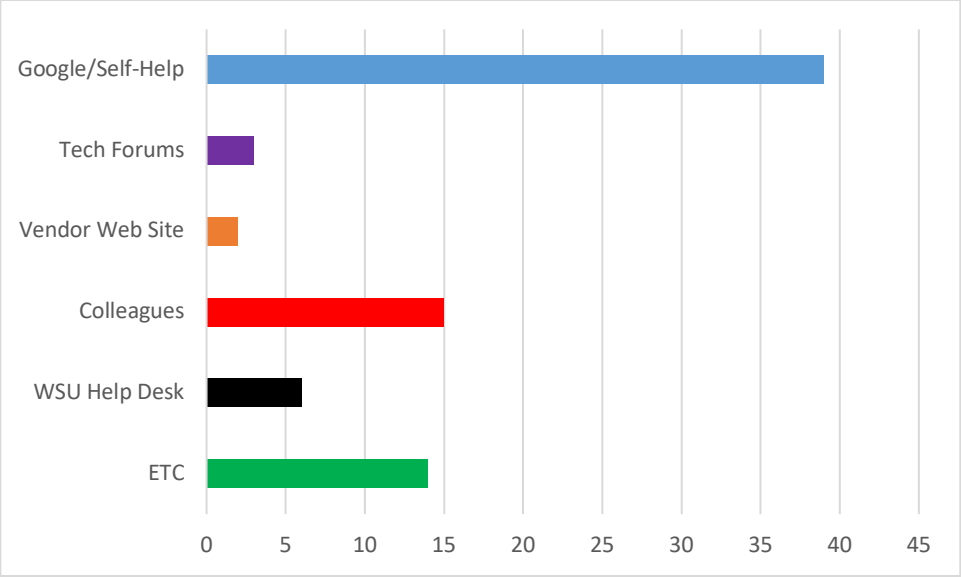

Figure 17. Sources for presentation software support.

Shown in Table 24 and Figure 18 are sources used to obtain support for data analysis software. Obtaining help for Colleagues and using Google/Self-Help are the preferred methods of getting assistance with this software.

Table 24

Sources of Data Analysis Software Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ETC	13	13.5	17.8	17.8
	WSU Help Desk	7	7.3	9.6	27.4
	Colleagues	21	21.9	28.8	56.2
	Vendor Web Site	4	4.2	5.5	61.6
	Google/Self-Help	28	29.2	38.4	100.0
	Total	73	76.0	100.0	

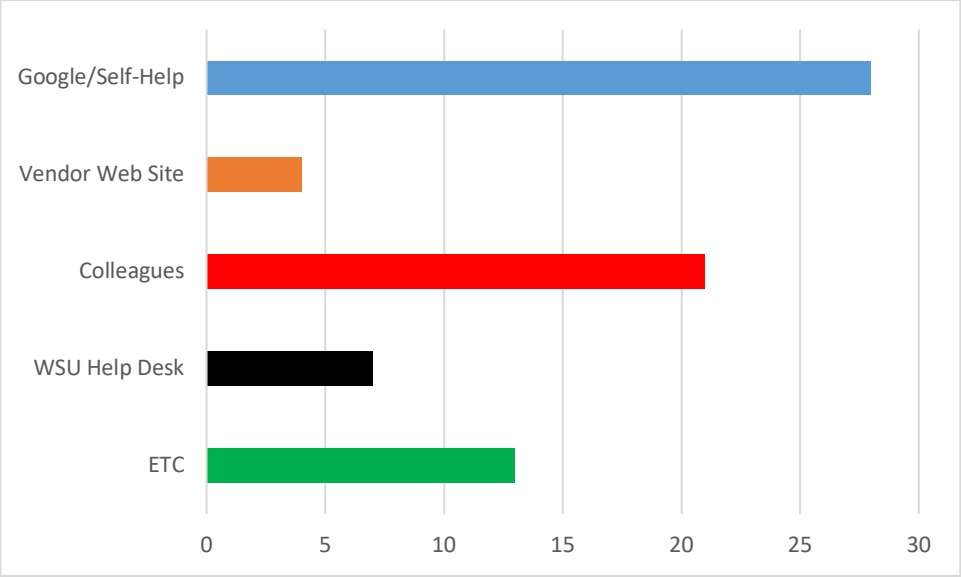

Figure 18. Sources for support for data analysis software.

Shown in Table 25 and Figure 19 are sources for graphic software support. Google/Self-Help, 30% and the ETC, 24% are the preferred support sources.

Table 25

Sources of Graphic Software Support

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ETC	24	25.0	32.9	32.9
	WSU Help Desk	8	8.3	11.0	43.8
	Colleagues	7	7.3	9.6	53.4
	Vendor Web Site	3	3.1	4.1	57.5
	Tech Forums	1	1.0	1.4	58.9
	Google/Self-Help	30	31.3	41.1	100.0
	Total	73	76.0	100.0	

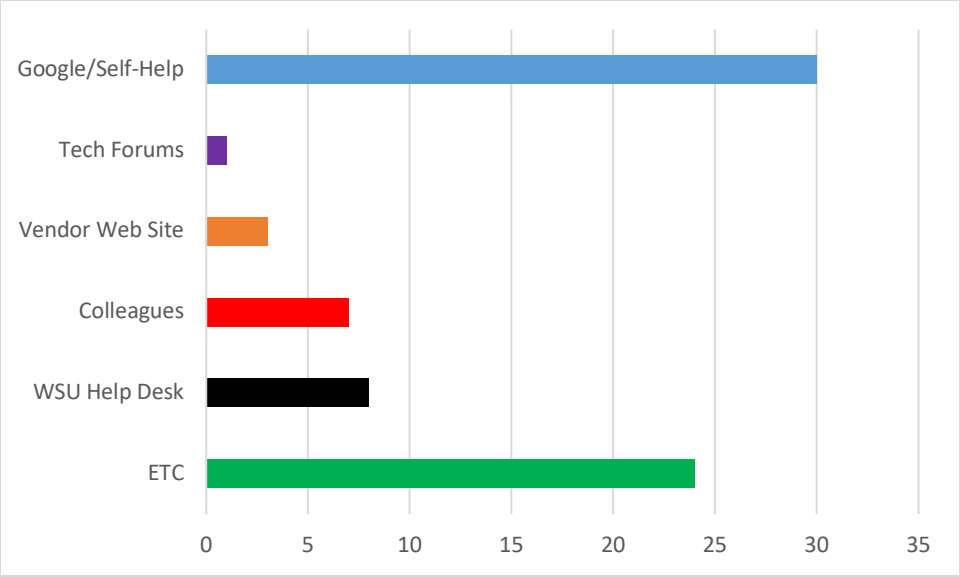

Figure 19. Sources for graphic software support.

CHAPTER 5 CONCLUSION

The purpose of this study was to answer a serious of questions regarding how faculty, administrators, and academic advisors obtained the necessary support to use the computer software to achieve tasks in the fulfillment of their duties, whether it was performing research, teaching, advising students, or performing ordinary tasks in conjunction with assigned duties. The results obtained from the survey instrument were used to address certain aspects of previous technology assessments that failed to gather data as to faculty, administrators, and academic staff demonstrate literacy and proficiency in regard to using computer software.

Survey responses gathered in regard to computer platform used showed the majority of respondents used the Windows operating system, although a majority preferred to use mobile computing platforms such as laptops or smartphones to accomplish computing tasks. Respondents were using the operating system generally preferred, and the Chi-squared test performed between current vs. preferred operating system was not statistically significant. Further data relating to software used for word processing, working in spreadsheets, and delivering presentations showed the Microsoft Office suite of software, as the most used software by the respondents. A small percentage used Google Platform products, such as Google Docs for word processing and Google Sheets for spreadsheet development, and Google Sheets for presentations.

Software used to analyze quantitative data as the dominant software used for data analysis, as opposed to qualitative analysis, with SPSS as the software of choice, used by 32.3% of users. A small number of respondents listed a need for specialty data analysis software. Future studies could be conducted to assess the development of certain trends in data analysis software usage, such as performing quantitative vs. qualitative analysis, and the possible impact of cloud-based and open source data analysis software packages.

Another focus of the study was to determine if the software used by the respondents had all the features needed, and if there was a need for software to process Adobe Portable Documents, (PDF). The software used by the majority of the respondents has all needed features, with 48.9% of users indicated they have the needed software to process PDF documents. However, a surprising number, 34%, either do not have the software or do not know if they need it. This finding could prove critical as the personnel evaluation system for promotion, tenure, and yearly evaluation requires the faculty to submit their materials in PDF format for assessment.

The data gathered in relation to online course development shows that at the present time, 37.5% of respondents do not have a need for this type of software package, but 38% responded they needed some sort of online course development software. As the pace of online course development may increase in future, further studies may reveal changing needs and the possible growth of cloud-based and open source software solutions for this group of software products.

Survey results related to the need and usage of software to manipulate images and create graphic content. There were 44.8% of respondents who did not have a need for this type of software at the present time. Of the 22.9% of respondents stating they needed this software, the majority requested the suite of Adobe products. Once again, a further study of this software package would be useful to ascertain future needs, and to track cloud-based and open source solutions in graphic processing and content creation.

Respondent software proficiency was evaluated using a 4-point Likert scale survey question, (0 = not proficient to 3 = very proficient). Descriptive statistics performed on the data included frequency, mean, and standard deviation. Cronbach's alpha, an indicator of correlation between answers especially Likert scale items, was used as a measure of reliability of the responses. The alpha obtained, .806, was a very high value, providing a good reliability estimate of the responses.

In analyzing the software proficiency table, the use of the mean proficiency produced a mean score of 1.91, with the rating scale of 0 (low) – 3 (high).

Using this mean score as a reference point, the sample exhibited a good proficiency rating of the software used by the sample group. An additional statistical test, a one-way ANOVA, was conducted on mean proficiency to examine the mean software proficiency between the Academic Advisor, Administrator, Tenured Faculty, Non-Tenured Faculty, and Part Time Faculty groups. The results of the ANOVA were not statistically significant, indicating the proficiency ratings between the different groups are not dissimilar, and the software literacy for the software packages investigated appears to be on a high proficiency level. Although the efforts of the Education Technology Center could be the reason for the high proficiency levels of the participants, it was unclear if the methods of support used to obtain assistance with software led to increased software literacy, or the increase was due to a high level of support from the Education Technology Center staff. As some faculty indicated they sought support from colleagues, future studies may examine this method closer to ascertain how obtaining support from colleagues is more beneficial than a purchased solution through software vendors and training entities.

Survey respondents were also asked to list the possible sources of software support that they used to obtain assistance in installing or using the various software packages installed on their computers. Possible sources included the Education Technology Center (ETC), the Wayne State University Help Desk, consultation with colleagues, accessing tutorials and forums on software vendor web sites, participating in and asking questions on web-based technical forums, and searching Google resources or using some other method of self-help to answer questions or obtain assistance with computer software. The assumption is that either the WSU Help Desk or the Education Technology Center (ETC),would be the first choices to seek assistance, but the data

proved otherwise. In cases of seeking assistance for software installations and resolving problems with the computer operating system software, the ETC was the support source of choice, which as an in-house technical support resource, this choice was expected.

Support for the commonly used applications, such as word processing, spreadsheet development, creating presentations, analyzing data, and manipulating graphics came primarily from using Google searches, giving strong support that the respondents prefer self-help to other forms of assistance. In seeking assistance for spreadsheet and presentation software, obtaining assistance from consulting with colleagues showed a strong position in the data, as shown in the tables and figures. It is interesting to note that in all software support options, the WSU Help Desk did not appear to be a significant source of support for the survey respondents.

Limitations

Several limitations encountered during the course of the study revealed how improvements in the survey instrument and method of delivery would improve the accuracy of the results. They related to the delivery method used for the survey, and the participation rate of the selected sample. The delivery method selected, releasing the survey through the Qualtrics website, allowed for an economical distribution to a wide audience with zero cost, but introduced extraneous variable, risking a bias in the results. As predicted in Chapter 3, the ease of distribution via the Internet proved to be an asset in terms of reaching the target audience, but the timing of releasing the survey affected the participation rate. Early review of the data received indicated the majority of the responses received came from twelve-month staff, with the nine-month staff off campus until the beginning of the 2018 – 2019 academic year. Sending a reminder after the beginning of the academic year improved the response rate to approximately 43%, improving the response rate as more nine-month faculty participated in the study, but the overall responses collected resulted in a smaller sample

size than what was originally hoped for.

Given the less than 50% response rate, the threat due mortality cannot be discounted as a potential limitation of the study. Extending the study past a 10-day time frame in an attempt to increase the response rate increased the chances the survey would suffer from mortality, as the email invitation could get lost in a user's inbox or be marked as junk mail and overlooked.

Sample size was a limitation to the study in the respect that ideally the entire university faculty, administrators, and academic staff formed the ideal target population. As aforementioned, administrative rules precluded the use of the larger population, restricting the study to the College of Education. Attempts to get a complete email listing of faculty proved difficult, as the beginning of the academic year had faculty leaving the college, and likewise new faculty accepting positions. It was unclear if the email listing used in the study was accurate and up to date.

Recommendations for Future Research

As shown in the review of the extant literature, exhaustive studies of technology implementation in colleges and universities have already been undertaken. Expanding on the current study, in examining software usage, and literacy would provide more data as to planning technology expenditures. Additional survey items in the form of Likert scale ratings, could help to provide more accurate survey data as to faculty attitudes and experiences with needed computer software products. New methods of software delivery, such as software subscriptions and cloud-based software services, need to be evaluated to determine if these methods offer cost savings and more efficiency in software package deployment. Open source alternatives, particularly in the data analysis realm, need examination to determine functionality and compatibility with existing and

often expensive, software packages. Further studies on how faculty, administrators, and academic staff seek and obtain support for their computer software could benefit from more in-depth question items, based on Likert scale scoring so more robust statistical tests can be run on the data collected. Further investigation as to why the respondents preferred to solve their own software problems using Google, would be of interest, especially in the planning of where to prioritize funds for software training and development. The answer may be a simple as computer users are more proactive at solving technical problems than in the past, and further surveys could discern emerging trends for software assistance options. Studies attempting to measure the satisfaction of response from in house resources such as the ETC and the WSU Help Desk, could provide data as to the effectiveness of these entities providing continuing assistance with software problems.

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ABSTRACT

ANALYSIS OF SOFTWARE USAGE BY AN R1 UNIVERSITY'S EDUCATION FACULTY, ADMINISTRATORS, AND ACADEMIC STAFF

by

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May 2019

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Major: Education Evaluation and Reseaarch

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The extant literature related to the study of technology deployed in higher education teaching environments focuses on the placement and use of technology in classrooms, and how effectively existing technology is used to deliver course content, complete assignments, and conduct assessment of student progress. While several studies have been conducted as to faculty need for technology hardware, the literature is mute in regard to which software packages faculty, academic staff, and administrators in higher education need to perform their job duties. Similarly, there exists scant literature in regard to how faculty, academic staff, and administrators in higher education obtain support for the software packages they routinely use. The current study seeks to gather this missing data through a comprehensive survey sent to the target population, ideally the entire faculty, academic advisor, and administrators in Wayne State University. However, due to administrative restraints, the current study is restricted to the aforementioned population of the College of Education within Wayne State University.

The software needs of faculty and academic staff working at a Carnegie R1, R2, or R3 doctoral institution can be substantial, depending on research needs and administrative duties.

Research activities require specialized software, including statistical packages such as SPSS, Minitab, Stata, and SAS that are used in conjunction with data collection and analysis.

Faculty within departments of a college may have specialized software needs. For example, the Microsoft Office Suite package is used for general administrative and support needs, but specialized software is required especially in conjunction with research projects. Many software programs are expensive and frequently require intense training to leverage all aspects of the program to best advantage. Depending on individual skill level, some users may not be using all the robust features of increasingly complex software packages. As the cost of software continues to climb, there is a need to establish if the faculty and staff have the needed software to function effectively and efficiently, as well as to discover what features of the software packages are needed, as well as which features are frequently used.

AUTOBIOGRAPHICAL STATEMENT

Kevin Carroll has been involved in implementing educational technology applications since 1980, when he joined the staff of the Foreign Language Laboratory, an academic support unit of Wayne State University's College of Liberal Arts. Working as an electronic engineering technician, supporting the language lab's mission of delivering audio programs via an electronic dial-access system, a forerunner in modern courseware delivery systems. Managing the lab's state of the art audio recording studio and assisting faculty with the creation of language drill and practice audio programs, it was a natural for Kevin's team to lead the implementation of the newly developed personal computer into the lab's content delivery system in May 1988. Originally deploying the IBM PC platform, the language lab expanded its educational computing platform to 60 student stations, each station equipped with interactive foreign language drill and practice computer programs. Kevin and his team further expanded the language lab's ability to deliver course content by installing digital audio/video recording equipment for modern language faculty to use in developing course content for the various foreign language courses.

Early in Kevin's career at WSU, he began a course of study in Modern European History, and was awarded the degrees of Bachelor of Arts, Cum Laude in 1993, and Master of Arts in 1997., each with a major in History.

In March 2000, Kevin transitioned to the College of Education at WSU, accepting a System Administrator position, to manage technology support and deployment for the college. Embarking on a wide-ranging program of upgrading computer, data storage, and networking technologies, Kevin's team working in the Educational Technology Center streamlined processes, trimmed costs, and enhanced the technology capabilities of the college and its classroom infrastructure. Managing the ETC complex and student computer labs, Kevin and his team also support major grant initiatives advanced by college researchers, with technology support.

Kevin began work in 2009 on the PhD. In Educational Evaluation &Research degree, awarded by the College of Education, with the expected graduation in May 2019.