Key Factors Influencing Job Satisfaction of Non-Tenured IT Faculty in the USA

Sharon Nesbitt Bazil and Shawon S. M. Rahman

***Abstract*—**This study increased the overall knowledge of job satisfaction among non-tenured IT faculty by way of contributing to the body of management knowledge in the IT environment. The study results provided higher education institution IT leaders and management the vision and understanding to handle job satisfaction issues within the IT environment. This information is also crucial in helping higher education institutions perform at high levels of employee retention, flexibility, and employee job satisfaction by focusing on autonomy and the opportunity for advancement. This quantitative research examined the relationship between (a) the extrinsic motivators (predictor/independent variables), operationalized as autonomy; (b) the intrinsic motivators, operationalized as advancement opportunities; and (c) the job satisfaction level of IT faculty in higher educational institutions (dependent variable). This research has added to the body of knowledge regarding what is needed for IT educators to have job satisfaction by examining how much the independent variables affect job satisfaction of IT faculty in higher educational institutions. We have defined and analyzed methods and practices that companies could apply as they formulate the essential skills and resources for predicting job satisfaction among IT faculty. In this area of job satisfaction, additional understanding could support higher education institutions learning how to keep experienced IT faculty. To examine the extent to which autonomy and opportunity for advancement predict job satisfaction, a multiple linear regression was conducted. This study added to the existing body of knowledge regarding what is needed for IT educators to have job satisfaction by examining how much the independent variables of opportunity for advancement and autonomy affect job satisfaction of IT faculty in higher educational institutions. Additional knowledge in this area of job satisfaction may support higher educational institutions in learning how to retain experienced IT faculty. By addressing these factors related to job satisfaction, employers can better understand what motivates and keeps IT workers satisfied in their jobs. Keeping IT employees satisfied will help retain them and prevent them from job-hopping

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I. Introduction

AUTONOMY and advancement opportunities are the two factors of job satisfaction that researchers have shown to be the two most important factors to IT professionals. As such, these two factors were included in the analysis for examination. Businesses must understand that retention efforts to retain most workers, such as bonuses, pay increases, vacation time, and flexible schedules, including telecommuting, are not working for IT professionals [1]. Researchers need to learn what organizations can do to entice and keep skilled IT professionals because this retention could increase the organization's productivity, marketing, customer service, and employee collaboration [2], as well as IT education in general. As such, IT workers continue to job hop, which costs companies time, human capital, money, and productivity [3]. Additionally, IT educators, as well as most workers, who are unhappy with their jobs put undue stress on the IT education system. When workers are unhappy, workplace stress rises, which causes a multitude of problems: (a) lack of focus leading to mistakes that derail productivity; (b) increased tension among co-workers that creates a hostile environment; and (c) health issues that result in time-off requests, which slow the natural flow of the workplace [4]. Through this study, we examined the relationship between the predictor/independent variables—extrinsic motivators, operationalized as autonomy, and intrinsic motivators, operationalized as advancement opportunities—and the outcome/dependent variable, job satisfaction level of IT professionals in a non-tenured position within a higher educational institution.

This research increased the overall knowledge of job satisfaction among non-tenured IT faculty by way of contributing to the body of management knowledge in the IT environment. The study results provided higher education institution IT leaders and management the vision and understanding to handle job satisfaction issues within the IT environment. This information is also crucial in helping higher education institutions perform at high levels of employee

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retention, flexibility, and employee job satisfaction by focusing on autonomy and the opportunity for advancement.

II. Review of the Literature

According to Wright and Straw [5] and Armstrong-Strassen and Ursel[16], a satisfied employee is a committed employee who plans to continue employment with the company because of the perceived support of the company and job satisfaction. Job satisfaction, as an overall theory, depends on the agreement between an individual's entirety of behavioral patterns, interests, emotional responses, social roles, attitudes, and other individual traits that withstand long periods of time and that person's work environment [7]. Job satisfaction is important to both the employee and the employer, as a company's profitability rate can be affected significantly by a 1–2% turnover rate [3]. Additionally, dissatisfied employees tend to have higher rates of absenteeism, produce less work than happier co-workers, arrive late to work, are more likely to quit, which can have a negative effect on the moral of the company [9][51] [62].

Job dissatisfaction reflects in the bottom line of an organization because the costs associated with discontented employees are easily measured by examining what the organization is spending to hire and train new employees[10]. Imran, et al. [12] reported that an employee's attitude is positive when he or she is satisfied with the job. Furthermore, workers seem more committed to their employer when they perform their duties more efficiently. Imran et al. [12] also found that workers employed in private sector companies had a higher level of job satisfaction. Furthermore, through this study, the researcher reviewed two variables, job satisfaction and job performance, which revealed that job satisfaction is strongly associated with the job performance of faculty and the two variables are in harmony. Hence, this finding explains the normal behavior of a worker—specifically, workers with higher levels of commitment to the company will perform more flawlessly than workers with lower levels of company commitment. Similarly, workers with a good attitude towards their jobs are satisfied with their jobs as compared to workers who did not have a good attitude towards their job.

Adams [6] studied autonomous motivation and found that changes in higher education institutions to a more corporate-style model contribute to faculty motivation. The results of Adams' study also provided support for the relevance of autonomous motivation for faculty in corporate-like environments in higher education. Participants in Adams' study perceived their motivation to teach to be controlled and did not perceive their motivation to teach to be autonomous. This perception is associated with low well-being and a lower level of effective performance by faculty. Adams confirmed that members of the faculty are experiencing less autonomous motivation in classrooms because of higher education institution environments possessing a more corporate-like structure. Within the workplace of higher education, the relationship between institutional commitment, faculty members, and leadership has been proven to be influenced by the role of autonomous motivation. Because of the study conducted by Adams [6], leaders in higher education have practical proof of the importance of an environment that supports autonomously motivated members of the faculty. An intrinsically motivated faculty member is autonomous because the motivation comes from within[20]. Moreover, the participants of the study reported that they felt that the actions of the higher education institutions caused them to be motivated to teach.

Waltman, Bergom, Hollenshead, Miller, and August [18] found that job satisfaction among non-tenured track faculty (NTTF) is influenced by teaching students, personal life, and flexibility. Given their findings, Waltman et al. determined that administrators could improve the level of institutional commitment and job satisfaction of NTTF significantly. Supporting the efforts of their teachers, endorsing policies that promote opportunities for advancement, and job security are how administrators can optimize their contributions to their institutions. Violino[21] stated that the level of job satisfaction directly relates to overall performance, including the workers' desire to remain employed at an organization. Businesses need to constantly discover exciting ways to inspire innovative thinking and offer perks and incentives that help retain IT workers [21]. As such, through the creation and promotion of a productive and healthy work atmosphere, IT executives can retain skilled professionals. Retaining skilled IT professionals is difficult if the department or organization is perceived as an unpleasant workplace. Employees need to feel that they are valuable team members who are encouraged to collaborate with peers and others within the organization [21].

Prasad, Enns, and Ferratt[23] affirmed that it becomes progressively more important to understand the influence of the arrangements of IT workers relating to job satisfaction as the employment arrangements for all workers, businesses, government, and other organizations become more and more dependent on the hard work, creativity, and skills of IT professionals. Information technology professionals are different from other traditional employees in terms of their pursuance of job satisfaction. Whereas traditional employees

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are motivated and satisfied by financial compensation, the same cannot be unanimously said of IT professionals [29]. In general, IT professionals often create new products, services, and technology ideas and post them on the Internet for anyone to download for free. This demonstrates that although IT workers perform their jobs for money, they are also motivated by an internal drive for workplace satisfaction..

Herzberg [52] revealed that when workers experienced certain intrinsic factors, such as enjoying the type of work they do, achieving a feeling-based performance, and advancing potential and job responsibilities, they were more satisfied with their jobs. Various scholars have used Herzberg et al.[45] two-factor theory as a springboard to define the concept of job satisfaction. For example, Greenberg and Baron [42] believed that understanding the concept of job satisfaction is crucial because no one particular way exists to satisfy every employee in the workplace. Greenberg and Baron also regarded job satisfaction as an emotion that can yield a negative or positive outcome concerning a worker's role and responsibilities on the job, whereas Robbins and Judge[65] viewed job satisfaction as a positive emotion toward a person's job. According to George and Jones[40], this concept combines beliefs and feelings, which include the emotional, physical, and mental domains. Arnett, Laverie, and McLane[19] believed that job satisfaction is reflective of a worker's overall emotional self-assessment of him or herself in the workplace environment. Additionally, job satisfaction can also be defined as a worker's emotional reaction to various job-related factors that result in finding comfort, confidence, recognition, personal growth, pleasure, and several positive opportunities for growth, such as upward mobility and appraisal done on a merit pattern with monetary value as compensation [40][42][65].

Diedericks and Rothmann[44] posited that job satisfaction is associated with flourishing because of its effects on life satisfaction and positive emotions, which form part of emotional well-being. As such, Diedericks and Rothmann[44] conducted a study investigating the relationship between work-role fit, supervisor relations, job satisfaction, work engagement, the availability of personal resources, and employee flourishing of IT Professionals. The researchers revealed that work-related factors (fit in work roles, availability of cognitive, emotional, and physical resources at work, and supportive supervision) of IT professionals strongly affected their work engagement and job satisfaction[44]. Those factors also—directly or through the work engagement—affected their flourishing. Work-role fit and personal resources had the strongest effect on work engagement and flourishing [44].

Work engagement makes an important contribution to the flourishing of IT professionals and plays an important role in the mental health of IT professionals [44]. Therefore, work role fit, availability of personal resources, supervisor relations, and work engagement relate positively to the flourishing of IT professionals. Diedericks and Rothmann's[44] findings confirm the important role of work engagement for the mental health of IT professionals. As expected, work role fit, trusting, supportive supervisor relations and the availability of cognitive, emotional, and physical resources significantly affected work engagement and job satisfaction [44]. Engaging in work might relate to flourishing because of positive affect and contentment/emotional well-being, and experiences of environmental mastery, sense of meaning, and purpose and autonomy (i.e., psychological well-being) experienced because of a match between an individual's skill and challenges presented by tasks.

In an effort to link personality traits to the job satisfaction of IT professionals, Lounsbury, Moffitt, Gibson, Drost, and Stevens [48] found that perceptions of the interpersonal atmosphere relate to how IT professionals engage at work. Lounsbury et al.[48] discovered that the perception of shared vision relates to absorption, dedication, and vigor, which are the three components of engagement. The findings in this study emphasized how individuals were dedicated to the path that leadership is taking the company and individuals feel as though they are a part of a cause when a vision is created and assimilated within the company[48]. Lounsbury et al.'s [48] findings were later validated by Doty [25], who asserted that absorption and vigor are related to the perception of shared compassion. Likewise, the findings of the study revealed that the degree to which workers engage is related to an interactive atmosphere perceived as caring. Doty [25] claimed that more engaged workers exist in organizations perceived as compassionate. Concluding that in a more compassionate place of employment, turnover is lower, workers are more satisfied with their jobs and are less stressed. Lounsbury et al. [48] Furthermore discovered an overall positive mood as an additional subconstruct of the interactive or interpersonal work environment. Information technology professionals perceived dedication to be positively related to a worker's overall positive mood [48].

According to Bassi and McMurrer[21], higher turnover and lower productivity is the negative cost of having employees who are not engaged. Gaining knowledge regarding what is needed to have engaged workers could have a positive influence if practices are put into place. Ramirez et al. [63] supported this by claiming that IT organizations that are

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implementing employee engagement initiatives are the ones earning higher returns. This study increased the knowledge of the behaviors of IT professionals regarding their perceptions of an interpersonal environment, as well as how the interpersonal environment might affect them. This understanding can serve as a leverage in training to increase the percentage of engaged IT professionals at work.

Lounsbury et al.[48] also revealed that IT professionals display much higher levels of the agreeableness trait than employees in other jobs do. The finding of agreeableness is unique, considering the prevalence of duties performed by IT professionals who are autonomously working as solo contributors. This study can be interpreted from the viewpoint of person-occupation fit theory, as Lounsbury et al. [48] found characteristics of multiple personality traits that differentiate the IT profession from other professions. The researchers concluded that IT workers scored extremely higher on agreeableness and tough-mindedness while scoring lower on seven other personality traits, which included optimism and assertiveness[48]. This is consistent with the job requirements of IT workers, which calls for a mix of interdependent and independent tasks [48]. The current finding is worthy of duplication efforts along with further clarification of how and why these results occurred. It appears that additional research and clarification is, for the most part, necessary where the current results conflict with traditional assumptions about IT workers, for instance, them having lower, as opposed to higher (as might be expected) levels of conscientiousness[48].

In an attempt to determine whether or not factors of retention acted as predictors of job embeddedness of IT and medical services staff, Van Dyk, Coetzee, and Takawira[74] focused predominately on the concept of job embeddedness. Yao et al. defined job embeddedness as the combined forces that keep a person from leaving his or her job. Perceived job embeddedness involves the organizational and community dimension, consisting of links, sacrifice and fit, the three subdimensions[74]. The authors determined that satisfaction of persons with organizational factors of retention, such as career development, supervisor support, training and development, and positive job characteristics significantly increase their sense of job embeddedness [74]. The retention factors, according to the researchers, can be used to increase the logic of job embeddedness of employees with limited skills in the IT and medical service industries to assist in retaining such employees[74]. The findings from this study contributed new and valuable information to the literature relating to retention of staff with scarce skills in the medical and IT services industries. Furthermore, the study indicated that individuals' feelings of organizational fit are positively heightened by supervisor support, including supervisor feedback, a reward from a supervisor, recognition for ideas, and feeling valued by a supervisor[74]. When employees are inherently dissatisfied with their jobs, their turnover intention increases and they are more likely to quit than those satisfied with their positions [9]. Hayes [43] acknowledged that retention of IT professionals is still one of the most persistent challenges organizations face. Information technology employee turnover rates in the United States ranged from 15–33% between the 1970s and 1990s. Adams et al.[8] stated that turnover of IT employees remains a chronic problem.

Because of the continuous decline in the supply of IT graduates, baby boomers retiring from IT, and the exponential growth of computer applications within organizations, the problem exacerbates as the IT labor market tightens [64]. In order to keep turnover intentions low, particularly within the IT community, organizations that employ IT professionals must be willing to offer a more modern workplace that focuses on increasing job satisfaction and decreasing the specific job demands that have the most negative influence on the workers' environments [36]. Ford, Swayze, and Burley[36] found that both exhaustion and disengagement showed statistically significant, positive correlations with turnover intention, with a stronger correlation between disengagement and turnover intention than expected based on prior studies where exhaustion was more strongly correlated [47][50][58].

Turnover affects organizations negatively and leads to researchers and organizations aiming to identify factors that predict why IT workers quit their jobs. Trends predict an increased level of difficulty in replacing retiring IT workers and keeping younger workers because the increase in hiring will entice workers with higher pay and advancement opportunities [36]. In an effort to identify and confirm the factors that are important to IT staff and most likely to influence their intention to quit, more research needs to be conducted. One of the key identifiers of turnover intention is rooted in the factors of role overload and role ambiguity within the workplace. In focusing specifically on the job performance of IT professionals in India, Gahlan and Singh [39] collected data from 400 individuals. Upon completion of data collection, the researchers concluded that the IT professionals perceived high levels of role overload, which means that too many expectations existed from their role set and they lacked the power of the situation, which created stress [39]. Information technology professionals also perceived high levels of role ambiguity, indicating that they were not clear about the expectations of their role. This may

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be because of the lack of information available to the role occupant or their inability to understand the cues available to them [39].

High turnover may not be associated with salary or flexible work schedule, but rather a lack of resources on the job or other demands [28]. The effect of low morale caused by burnout or low commitment may emulate the effect of employee turnover [28]. Retaining a team of productive, committed and healthy IT employees is essential for preserving the corporate advantage. More research is needed to identify and confirm the factors important to IT staff and most likely to influence their intention to quit. The negative effects that employee turnover has on organizations have led to considerable interest in identifying the factors that predict job satisfaction of IT professionals. Coombs[28] stated that several studies revealed that the major factors were job satisfaction with its antecedents, role conflict, and ambiguity, and perceived organizational commitment.

In a similar study, Tschopp, et al. [66] examined if career orientation shaped job satisfaction and the intent to turnover. Tschopp et al. [66] found that career placements moderated dynamic and static associations between turnover and job satisfaction. In view of the dynamic link, employees focused on loyalty seem to react less to low or decreased job satisfaction with high or increased turnover intention, while overall having comparatively low turnover intention [66]. In contrast, independent employees have a generally high turnover intention but seem to also be affected more strongly by changes in job satisfaction[66]. That is, independent employees, increase their turnover intention when things get worse, but also rethink their high preferences for mobility in order to not lose out on opportunities in the current employment. For career orientation as a moderating variable in the static job satisfaction-turnover intention link, Tschopp et al. [66] only found partial support. Tschopp et al. [66] asserted that more investigation was needed to detect relevant interrelated factors that affect different reactions to the job (dis)satisfaction at various points in time.

Agarwal et al. [13] stated that a notable difference exists in the needs of an IT professional in late adulthood as well as early and middle adulthood. Workers who enter late adulthood desire a lengthier job period, which affects IT professionals' desired duration of employment [13]. Essentially, the older the IT professional is, the less likely that individual will be to experience any sort of turnover within their organization. This is important because it allows for organizations to understand the basis for job satisfaction and dissatisfaction amongst employees. Organizations that deal predominately with older workers are less concerned with retention, as suggested by Agarwal et al. [13] because older workers desire lengthier periods of employment than younger workers do. If the older worker is not satisfied then they will be just as likely to leave their position as their younger counterparts, which will ultimately affect the bottom line, and organizations may accrue serious financial losses when this occurs [13].

For higher education to remain competitive for students, faculty, staff, and outside funding, they need strong IT departments [57]. Information technology professionals within education systems are often vulnerable to job pressure factors, such as stress, because of labor shortages and a need for more communication with people other than IT professionals across campuses [35]. This raises concern regarding IT professionals' ability to interact according to emotional intelligence (EI). Little information exists regarding the two EI aspects of IT professionals (interpersonal and intrapersonal skills) and their relationship to professional roles. As such, Trevino [35] sought to examine the relationships between various roles of IT professionals in higher education and their interpersonal and intrapersonal skills of EI. Upon data collection, Trevino found that no significant difference existed in relationship to job title and education with EI; however, enough descriptive statistics existed on the individual IT professionals to confirm that they have lower scores in the subscales of the interpersonal and intrapersonal skills. As such, the researcher determined that certain areas in an IT professional's behavior are unique[35]. This information poses some questions in terms of how to best solve or work with this behavior. Since EI itself has just become a validated measurement of emotion and behavior in general, the measurement of EI among IT professionals is still new. This study contributed to filling this gap in the literature.

Researchers need to understand what motivates IT, faculty, to help recruit and train those workers. Additionally, understanding the motivational factors of IT professionals is important to the success of providing skilled IT professionals in the workforce. Payne [61] attempted to understand what motivates IT faculty and found that the focus should be on autonomy and significance, as these two dimensions had the largest differences in regards to satisfaction. Payne [61] revealed that IT faculty members had a reasonably strong desire to learn and grow. To increase retention and recruiting efforts for new IT faculty members, it is crucial to work with faculty to redesign faculty job characteristics. This redesigning is because results have indicated IT faculty members possess the core job dimensions that lead to high internal motivation.

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Based on the findings, Payne [61] recommended that IT faculty members engage in networking opportunities, which can help faculty members expand their skillsets, producing additional information on the significance of faculty members' work in the IT industry. Payne [61] also expressed that faculty should have the freedom to implement changes, once they have been approved, which will increase the employee's autonomy. In an effort to provide IT faculty with insight regarding how they influence the lives of the students, Payne [61] recommended that these professionals work with division chairs to correct negative student feedback trends and enhance lesson plans based on positive feedback. Additionally, Payne [61] recommended faculty work with deans and department heads to redesign responsibilities with the goal of increasing faculty member self-motivation.

Curran[30] studied the problem of job satisfaction among IT faculty in the context of for-profit higher education institutions. The researcher's focus was on identifying the factors that add to the overall satisfaction of faculty teaching online[30]. The three categories that Curran[30] grouped factors of satisfaction into were instructor-related factors, student-related factors, and institution-related factors. Generally, the faculty studied seemed to be reasonably satisfied with their experience teaching online. Consequently, the student-related factors contributed most significantly to overall satisfaction, whereas less influential factors were the institution-related and instructor-related factors [30]. These results are comparable to the factors identified with the online satisfaction of not-for-profit faculty studied in the original use of the Online Faculty Satisfaction Survey[22]. Though institution-related factors of for-profit online faculty were noticeably lower, the most remarkable part of this study was the significant influence of faculty status on the overall satisfaction between all metrics analyzed[30].

Bolliger and Wasilik[22] also revealed that generally, faculty who teach part-time appeared to fit in with the higher education institution and seemed moderately satisfied with most of the satisfaction parameters measured in the original study using this instrument Online Faculty Satisfaction Survey. In contrast, a different portrayal of the experience of online faculty materialized when the researchers divided the status of faculty into two groups (faculty who taught at multiple schools and faculty who taught solely at the for-profit university;[22]). The results revealed a degree of dissatisfaction for the group who taught at multiple schools as the metrics were higher than anticipated [22]. Similarly, the high levels of satisfaction for faculty teaching part-time exclusively at the for-profit university were not anticipated. The results showed that faculty teaching online part-time were divided into two different subcultures within the university, very satisfied and highly dissatisfied. Full-time faculty members showed a much smaller degree of division based on faculty status.

As professionals within the educational sphere, IT workers are exposed to the same types of stress as educators. Subsequently, teachers are a vital resource to education establishments. Therefore, higher education institutions need to invest substantial resources in examining the physical as well as mental needs of teachers' work environment to capitalize on the quality of service delivery. This is important because teachers are a valuable resource to educational establishments [59]. Hiring additional administrative staff to assist with matters not related to teaching can reduce job-related stress, as teachers will be able to focus more on teaching [59]. Additionally, Nagar [59] found role ambiguity and stress to be related. This relation occurs whenever inadequate data exists regarding job duties and doubt about expectations from coworkers and higher authorities [59]. Stress arising out of such ambiguities can be reduced if the human resource management policies indicate a clear job description for each teacher, head of the department, and administrative staff member [59]. As such, Nagar examined three factors of burnout as potential antecedents of 153 university teacher's job satisfaction and the effect of increased job satisfaction on pledge among employees toward their higher education institution. Burnout, another psychological construct, was a source of concern for the management. Encouraging educators to attend workshops that include a component for stress management is a possible plan to implement to help with employee burnout [59].

Based on the occurrence of major changes in technology education during the past decade, higher education institutions need to better understand job satisfaction of professionals in technology education to successfully attract and retain them. One of the main factors within the educational community is that of job satisfaction, especially among educational professionals. According to Wright and Custer [76], findings of teacher satisfaction tend to support Maslow's theory of needs-fulfillment, wherein esteem and self-actualization on the job had a significant effect on the satisfaction of teachers. When the researchers interviewed the teachers, the responses revealed that excitement, stimulation of learning, and working with new technologies were the most enjoyable aspects of teaching [76]. Following the notions of excitement, learning stimulation, and working with new technologies, teachers also reported satisfaction in their jobs when it came to working

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with students, expressing personal satisfaction in making meaningful differences in the lives of students [76]. Finally, teachers reported that the autonomy that was granted to them gave them flexibility and freedom that they particularly found satisfying in their jobs [76]. Out of the 25 positive comments reported, nine related to students in some fashion, while six related to the technology education content area [76].

In addition, low pay was not among the top three factors of job dissatisfaction in regards to these teachers [76]. The findings in this study were consistent with Wright[70], who concluded that certain intrinsic rewards, such as autonomy and esteem, offset perceived awards, such as low pay. Additionally, the findings revealed that only when intrinsic rewards are significantly reduced or not present does salary becomes a serious issue [76]. For recruitment efforts, managers should focus on independence and autonomy in daily routine, the excitement of new technologies, and the enjoyment of working with children as some practical and realistic steps for the technology education profession [76].

Wright [70] previously determined that Maslow's hierarchy of needs revealed a significant positive relationship between job satisfaction and technology teachers' perceived esteem. Within this study, Wright used the factors of student respect, professional respect, pride in the profession, community support, and organizational recognition as resources for a derivative of esteem. Wright [70] focused on the difference between desired and perceived/actual esteem, finding that job autonomy, recognition, teaching assignment, and current years on assignment closely related to job satisfaction. In addition, salary—one of the key hygiene factors in Herzberg's two-factor theory—was not related to job satisfaction [70].

Flexibility and autonomy emerged as the most significant factors for job satisfaction in that they allowed for intrinsic growth and professional recognition, which are determinants of job satisfaction for university faculty [69]. According to Sharma and Jyoti[69], job characteristics, promotion, and recognition are the intrinsic elements that accounted for maximum fluctuation of job satisfaction. Among the demographic variables present in the study, gender and level of education considerably affected job satisfaction [69]. Finally, Sharma and Jyoti reported that participants rated the contribution of other factors, such as pay, relationships with colleagues, relationships with students, and working conditions as being fairly insignificant when it came to determinants of job satisfaction. Temple [73] discovered similar results while studying the perceived job satisfaction of IT professionals working in California community colleges.

The findings of the research revealed that coworkers, in addition to the actual work, play a significant role in IT professionals' job satisfaction levels [73]. Additionally, both motivation and satisfaction can be maintained at all seniority levels and IT professionals may be unique in this respect, as research has shown a decline in satisfaction with longevity and age [73]. In the examination of job satisfaction, Temple found that location was not a significant factor in the priorities for IT professionals.

Khoury[53] similarly studied job satisfaction levels among IT faculty in education. This researcher found that, of the 110 participants in the study, 60.8% reported being either satisfied or very satisfied with their job. Khoury reported that the level of job satisfaction was consistent with other studies regarding the level of job satisfaction among professionals in community colleges[67][77]. Khoury's findings also indicated that age may play a part in the level of job satisfaction felt among computer instructors in community colleges targeted in this study. Khoury determined a significant difference existed in perceived recognition among the various age groups of community college computer instructors in North Carolina, which was the sample for the study. These results were consistent with some of the other studies in the field, indicating age plays a factor in job satisfaction [32]. Analysis of these variables revealed that community college computer instructors' job satisfaction was not related to the level of education, experience, or gender. Khoury's study aids higher education institutions in understanding how to increase and maintain employees' job satisfaction and avoid a turnover. Additionally, in the study, Khoury[53] the examination of each question using the years on the present job revealed two significant effects, satisfaction with compensation and the chances for advancement [53]. For both, satisfaction peaked among those with 2 to 5 years of experience but declined thereafter. Last, when considering the years spent in the field, one item—the opportunity to do different things in the position—was significantly higher; satisfaction scores were observed after a minimum of 6 to 10 years in the field [53].

When teachers are no longer satisfied in their positions because of extensive burnout, schools run the risk of having a high turnover rate [33]. In a study on Minnesota technical college teachers, Ruhland[68] found that satisfaction with career or job, opportunity to advance and personal characteristics were variables that contributed to the retention of teachers. Ruhland reported that job-related stress was the most common reason most teachers leave and that those who did not leave were highly committed to teaching. Of the participants, it was reported that 31% were influenced to leave

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the job because of job-related stress and that the teachers who left the profession did not positively rate the first year of teaching [68].

Freeman and Aspray[38] also studied faculty retention in the field of IT and found that IT faculty turnover rates were between 12 and 15%. Freeman and Aspray stated that because of the high turnover rate for IT faculty, higher education institutions need to foster a multi-faceted system for retaining and recruiting IT professionals. Freeman and Aspray recommended that hiring IT managers and human resource personnel focus on relationships between institutional objectives when staffing IT positions. Whereas the needs of the higher education institution should be clearly aligned with competencies and staffing skills, retention begins with well-constructed jobs linking the precise combination of challenges and activities. As stated by Freeman and Aspray, a clever hiring process that is well-designed will attract the person whose talents, skills, and values match the higher education institution's talents, skills, and values.

Additionally, Freeman and Aspray[38] stated that a good operational strategy for higher education institutions includes effective management practices, promotion, annual appraisal process, compensation, and progressive planning. The researchers recommended the use of a tool to track turnover, which should include an exit interview process[38]. Information technology professionals with qualified skills are highly sought after. According to Freeman and Aspray, higher education competes with the industry for the highly transferable skills of IT professionals. Freeman and Aspray[38] stated that flexibility is essential in the dynamic field of IT. As such, the willingness and ability to modify the structure of the higher education institution, job classification, and job structure as often and quickly as needed is important for recruiting and retaining IT faculty in higher educational institutions. Retention strategies are critical for higher education institutions to be able to maintain and support advanced computing systems and fuel product development. As business needs increase and the pools of talent decrease, this gap leaves employers grappling with the problems of retention as employees seek other opportunities. This gap prompted DeLong's [31] qualitative study regarding IT faculty. DeLong sought to ascertain strategies for retaining IT faculty. Knowing these tactics will provide significant insight into technology leaders regarding how to improve IT retention. DeLong[31] thoroughly examined the existing literature on the topic of IT retention and the major themes of work-life conflict, career orientation, effective commitment, employee engagement, and job embeddedness as important attributes determining retention strategies for IT professionals. Additionally, understanding the best strategies of IT professional retention will reduce the financial and productivity effects to the higher education institutions.

DeLong[31] studied IT professionals to assess what effective strategies were employed by their employers to retain their professional skills. By looking at technology leaders, DeLong[31] gained significant insight regarding how to improve IT retention through a careful application of strategies. The strategies discovered were representative of a comprehensive and thorough approach that technology leaders can employ when investigating issues with retention [31]. DeLong identified strategies that allowed for retention of employees, including conducting regular meetings to effectively communicate and share important information, encouraging collaboration between employers and employees to build commitment, and creating challenges and opportunities to drive employee motivation. DeLong [31] also asserted that leaders should develop and standardize training and mentoring initiatives, create an environment to support team collaboration, and provide opportunities for organizational advancement. Leaders should create accountability policies, encourage active participation in meaningful work, develop methods that allow for effective goal and objective communication, and plan team building exercises [31]. Finally, DeLong posited that leaders should provide an environment in which IT professionals can thrive, create policies that emphasize benefits and opportunities, create an atmosphere of working flexibility while providing guidelines to balance work and personal needs and build a culture to foster trust.

To summarize, overall five themes existed to which participant responded: (a) career orientation, (b) work-life conflict, (c) employee engagement, (d) affective commitment, and (e) job embeddedness. DeLong shared that these themes and underlying key strategies focused specifically on the "constructs of effective communication, collaboration, creating challenges and opportunities, training and mentoring, career advancement, accountability, understanding the systemic view, knowledge of organization goals and objectives, team building, positive working environment, benefits and opportunities, flexibility, work-life balance, and trust". Because of this, technology leaders have a unique opportunity to incorporate these strategies to improve retention and create a positive environment where IT professionals seek employment. These strategies are beneficial for employers to consider, especially in the current technological landscape where potential employees have the

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opportunity to reach out to current employees, through LinkedIn or other networking media, to assess overall job satisfaction. This finding was reiterated in Lim's[55] study, which involved investigating the overall job satisfaction, along with a variety of other measures of satisfaction within the work environment, of library IT workers.

III. Research Design

This study used a quantitative exploratory regression analysis approach using the JSS, a previously validated survey instrument, to examine the effect of job satisfaction among non-tenured IT professionals working in higher educational institutions. A quantitative approach is appropriate when the research involves constructs or concepts that can be objectively measured and quantified. Specifically, the constructs of autonomy, the opportunity for advancement, and job satisfaction were investigated. These constructs are numerically measurable using empirically validated instruments [71]. Therefore, a quantitative method was appropriate for this study. This study included methods adopted from the physical sciences designed to ensure objectivity, generalizability, and reliability [54]. A qualitative study would have been inadequate because our objective was to observe quantifiable measurements and outcomes and not to explore lived experiences and perceptions.

A nonexperimental, exploratory regression approach was employed to examine autonomy, advancement opportunities, and job satisfaction. According to Gainey and Clenney[49], autonomy and advancement opportunities are the two most important factors of job satisfaction for IT professionals. A nonexperimental, exploratory regression approach is appropriate when the goal of the researcher is to examine relationships between variables. Because the goal of the present study was to examine the relationships between autonomy, the opportunity for advancement, and job satisfaction, a nonexperimental, exploratory regression approach was appropriate. It was aimed to investigate the extent of a relationship among the three variables of interest.

A. Data Collection

Data collection occurred through a self-administered cross-sectional survey offered online to random selected non-tenured IT faculty in higher educational institutions. The solicitation email contained the purpose of the study, criteria to participate in the study and a description of the study. The email included a link to access the survey and interested participants who met the criteria accessed the informed consent form and survey through Survey Monkey. After agreeing to the informed consent, participants were directed to the online survey containing the JSS. The JSS measured the independent variables (autonomy and opportunity for advancement) and the dependent variable (job satisfaction) of the study.

B. Data Analysis

Data was entered into IBM SPSS Version 22.0 for Windows for analysis. IBM SPSS Statistics is an International Business Machines Company located in Armonk, New York, United States. Prior to analysis, the dataset was examined for missing cases, inaccuracies, and outliers. Participants missing significant portions of their response data were removed from the dataset. Frequencies and percentages were calculated to ensure that all responses provided were within the range of valid responses. This study also calculated standardized scores to investigate the presence of outliers. Standardized scores above 3.29 standard deviations from the mean were considered outliers per the guidelines established by Tabachnick and Fidell[72]. These values were removed from the dataset. Additionally, an inter-item reliability analysis was conducted using Cronbach's alpha to assess the reliability for each of the subscales in the present study. According to George and Mallery[46], Cronbach's alpha coefficients of 0.7 or higher indicate acceptable reliability. Reliability for the three subscales ranged from good ($\alpha = .89$) to excellent ($\alpha = 0.96$). Therefore, the subscales used in the present study were reliable

To address the research question and hypotheses, we conducted a multiple linear regression. When the goal of the researcher is Note. $F(2,61) = 537.83$, $p < 0.001$, $R2 = 0.95$. to assess the extent of a relationship among a set of dichotomous or interval/ratio predictor variables on an interval/ratio criterion variable, an appropriate analysis is the multiple linear regression. The independent variables in this analysis were autonomy and opportunity for advancement. The dependent variable under investigation was job satisfaction. The analysis involved the standard method of variable entry, meaning that all predictor variables were entered into the regression model at the same step. The significance of the overall model was assessed using the F-test and the significance of the individual predictors was assessed using t-tests. An alpha level of 0.05 assisted in determining statistical significance.

The assumptions of multiple linear regression were assessed prior to the analysis. Included in these assumptions were normality, the absence of multicollinearity, and homogeneity of variance. Normality means that the regression residuals follow a normal distribution. This was tested by examination of a normal P-P plot. If the data points in the normal P-P plot follow the normal line (i.e., diagonal), then the assumption of

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normality is met. Homogeneity of variance means that the data are equally distributed around the regression line. We tested for homogeneity by examination of a scatterplot of residuals versus predicted values. If the data points in the scatterplot are approximately equally distributed around zero, then the assumption of homoscedasticity is met. The absence of multicollinearity means that the predictor variables are not too highly correlated with each other. Variance Inflation Factors (VIF) tested this assumption. Stevens [75] suggested that VIF values higher than 10 indicate the presence of multicollinearity. Therefore, if all VIF values are below 10, then this assumption is met.

C. Instrument

Through this study, we measured perceptions related to job satisfaction, autonomy, and opportunity for advancement among a sample of IT professionals working in educational institutions using the JSS created by Spector [71]. The JSS contains 36 items related to intrinsic and extrinsic satisfaction factors. Participants respond to each item using a Likert-type scale ranging from 1 (disagree very much) to 6 (agree very much). The items corresponding to overall job satisfaction and each subscale are summed to create composite scores[71]. Job satisfaction was operationalized as the general satisfaction score [71]. An overall satisfaction score was created by summing responses to all 36 items on the JSS. Since several Likert-type responses were summed to create a composite score, this variable was appropriately treated as an interval measure.

The autonomy variable was assessed using the extrinsic motivation subscale of the JSS. An autonomy score was calculated by summing the items relevant to autonomy in the JSS. These include Items 6, 9, 26, and 36 of the JSS. Since several Likert-type responses were summed to create a composite score, this variable was appropriately treated as an interval measure. Opportunity for advancement was measured via the intrinsic motivation subscale of the JSS. An opportunity for advancement score was calculated by summing the items related to the 'promotion' subscale. These include Items 2, 11, 20, and 33 of the JSS. Since several Likert-type responses were summed to create a composite score, this variable may be appropriately treated as an interval measure.

D. Validity and Reliability

The JSS is a previously validated survey instrument. Spector[71] originally demonstrated the validity and reliability of the JSS using a multitrait-multimethod analysis. In Spector's original scale development study, the JSS showed acceptable convergent and discriminant validity with the Job Descriptive Index. Specifically, the subscale correlations between equivalent constructs were high, ranging from 0.61 to 0.80. The correlations between equivalent constructs were all higher than the correlations between nonequivalent constructs (.18 to .61). A factor analysis also showed a nine-factor solution corresponding to the nine subscales of the JSS [71]. Additionally, the JSS demonstrated high inter-item reliability with a Cronbach's alpha of 0.91 for overall job satisfaction.

E. Description of the Sample

The sample size necessary for the study was calculated using G*Power 3.1.7. For the multiple regression with an effect size of 0.15, a power of .80, an alpha of .05, and 2 predictors, a minimum sample size of 68 was necessary. The power of the test is the probability of rejecting the null hypothesis when the null hypothesis is false. An acceptable level of power for the study was .80. Since it is typically more serious to make a false positive claim that it is to make a false negative claim, .80 is an acceptable level and was considered in determining the sample size a priori [26]. For social science research with limited existing research related to the potential relationship between variables in the sample population, a medium effect size and an alpha of .05 is acceptable [72]. A total of 75 IT faculty responded to the survey, which exceeded the minimum required sample of 68, as determined by the power analysis. Prior to the analysis, we screened the data for missing responses and outliers. No participants were missing a large number of responses (i.e., more than 50% of the survey questions). We tested the presence of outliers by the examination of standardized values. Scores with standardized values higher than 3.29 or less than -3.29 were considered outliers [60]. No outliers were detected, and thus no participants were removed from the dataset.

F. Details of Analysis and Results

To address the research question, we performed a multiple linear regression. Prior to the analysis, the assumptions of the multiple linear regression were examined. The independent variables in this analysis were autonomy and opportunity for advancement. The dependent variable in this analysis was job satisfaction. A standard multiple linear regression was conducted, meaning that all predictor variables were entered into the regression model at the same step. Prior to the analysis, we assessed the assumptions of normality, homogeneity of variance, and absence of multicollinearity. Normality assumes that the data are normally distributed, and

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was assessed using a P-P plot of standardized residuals. The data did not vary significantly from the normality line (illustrated in Figure 4), so the assumption was met. Homogeneity of variance assumes that groups have equal error variances. A scatterplot of residuals was utilized versus predicted values to assess homogeneity of variance (illustrated in Figure 5). The data were equally distributed around zero, so this assumption was also met. The absence of multicollinearity assumes that the predictor variables used in the regression are not too closely related, and was assessed using the Variance Inflation Factor (VIF) scores. Any VIF score above 10 indicates the presence of multicollinearity[75]. All VIF scores were below 10 (see Table 3), indicating that the assumption was met. Additionally, An inter-item reliability analysis was conducted using Cronbach's alpha to assess the reliability of the composite scores that were created. The Cronbach's alpha provides the mean correlation between each pair of items and the number of items in a scale, also known as the coefficient alpha [27]. Cronbach's alpha coefficients were evaluated using the guidelines suggested by George and Mallery[46], where > .9 Excellent, > .8 Good, > .7 Acceptable, > .6 Questionable, > .5 Poor, and < .4 Unacceptable. Reliability for both job satisfaction (α = .96) and opportunity for advancement (α = .92) was excellent. Reliability for autonomy was good (α = .89). Table 2 presents Cronbach's alpha scores for the composite scores.

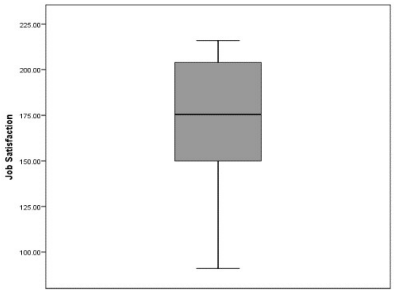

Figure 1. Boxplot for job satisfaction

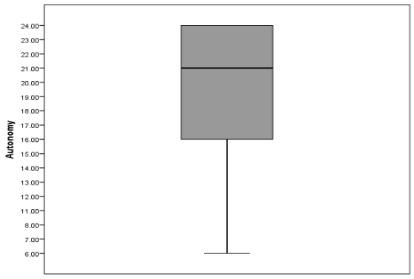

Figure 2. Boxplot for autonomy

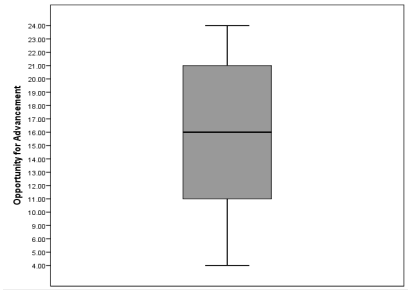

Figure 3. Boxplot for the opportunity for advancement

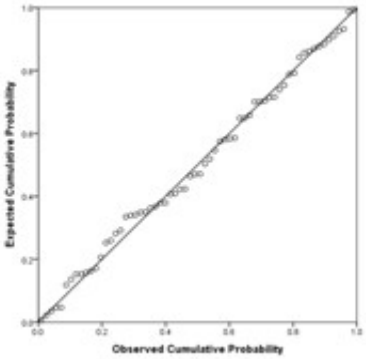

Figure 4. Normal P-P Plot

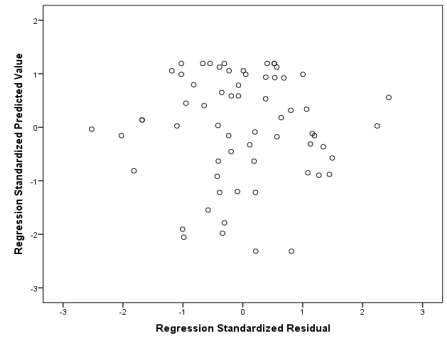

Figure 5. Scatterplot residuals vs. predicted values

The results of the overall regression model were significant, F(2,61) = 537.83, p < .001, R2 = .95, which indicates that together, autonomy and opportunity for advancement significantly predicted job satisfaction. Therefore, H10 was rejected in consideration for H1A. The coefficient of determination (R2) value suggests that these two variables together account for 95% of the variability in job satisfaction. Examination of the individual regression coefficients revealed that both autonomy (B = 4.40, p <.001) and opportunity for advancement (B = 12.47, p <.001) were significant positive

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predictors of job satisfaction. For every 1-unit increase in autonomy, job satisfaction increased by 4.40 units, and for every 1-unit increase in opportunity for advancement, job satisfaction increased by 2.33 units.

IV. Conclusions

The results showed that autonomy and opportunity for advancement both positively predicted job satisfaction. As autonomy and opportunity for advancement scores increased, job satisfaction also increased. Therefore, H10 was rejected in consideration for H1A. The results demonstrated importance in a number of ways, including various implications associated with the findings. These implications included that in order for organizations to achieve full benefit from the knowledge and skills of IT professionals, organizations need to ensure that the job roles of IT professionals are fitting as they concurrently provide advancement opportunities. Furthermore, promotions earned by workers gives them a better feeling of job satisfaction and achievement. The final implication was that organizations must revise policies and strategies to improve advancement opportunities for IT professionals and organizations must determine better ways of implementing these policies and strategies. The multiple linear regression showed that autonomy and opportunity for advancement both positively predicted job satisfaction for IT professionals working in non-tenured positions in higher educational institutions. As such, we recommend that policies and strategies be revised to improve advancement opportunities for IT professionals and that companies determine better ways of implementing these policies and strategies. Results from this study can help higher educational institutions figure out a plan to retain IT faculty working in non-tenured positions.

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