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Work Productivity of Professionals as Social Network Technology Diffuses in the Health Care System: A Case Study

Dr. Abdel Rahman Toure
Department of Instructional Computing, Estrella Mountain Community College, Avondale, Arizona, United States

Corresponding Author: **Dr. Abdel Rahman Toure**

Abstract
Social network technology over the years has proven to be beneficial as many businesses, and individuals leverage it to meet their goals. However, some tend to abuse its use, which then affects their work productivity. This study sought to examine the relationship between SNT use among health care professionals and their productivity. Roger's theory of diffusion of innovation coupled with Campbell *et al*. theory of performance formed the theoretical foundation for the study. The respondents (n = 123) included 65% team members, 25% independents, 8% team leaders, and 2% administrators. A multiple regression analysis following a correlation analysis showed a significant relationship between SNT sub-variables (frequency of SNT use, duration of cellphone-based SNT use, duration of PC-based SNT use, and performance rating) and knowledge worker productivity. The findings indicated performance rating out of all the four attributes of the SNT variable statistically predicts productivity. The findings may be useful for senior managers in the health industry in an effort to improve productivity.

Keywords: Diffusion, Knowledge Workers, Healthcare, Overuse, Social Network Technology

1. Introduction

In certain organizations, employees can just blog or tweet ideas regarding new products and improved services, which senior managers could access instantly. Researchers have recently observed that while at work, it is becoming increasingly common to observe people on their personal computers (PCs) or cell phones chatting on Facebook or sending and receiving tweets from friends and other acquaintances. They do that under the pretext of multitasking, but current studies indicate that an increasing number of knowledge workers are spending more time using SNT every day, leading to a decrease in productivity. This observation calls for an empirical study to assess the relationship between the use of SNT and the productivity of the knowledge worker.

The diffusion of SNT has increased in these modern times. Among health care professionals, this phenomenon has become common. The observation may partly be attributable to the power of the computer doubling every 18 months. The specific problem addressed in this study was a decrease in productivity resulting from health care professionals' (knowledge workers) increasing desire to interact with SNT during working hours.

The intent of this quantitative research was to find the relationship among the variables of SNT usage (frequency of SNT use, PC-based SNT duration of use, cellphone-based SNT duration of use, knowledge worker performance rating) and knowledge worker productivity levels in the health care industry. To achieve this purpose a web-based Likert-type questionnaire designed to measure each variable was sent to a sample of 1,500 certified registered nurse anesthetists after obtaining their informed consent. That required 85 responses based on power analysis. Statistical Package for the Social Sciences (SPSS) was used for analyzing the data.

Theoretical Framework for the Study

Rogers (1995) [12] helps to explain how and why knowledge workers adapt to technological innovations in his diffusion of innovation theory. He pointed out that the main reason for the adoption of innovation is the perceived advantage. Therefore, as people see the possible benefits of new technology, they tend to use it, and as they share their experiences, others are encouraged to try it. An advantageous/compatible innovation is highly likely to be accepted and espoused over an undesirable one (Sabus & Spake, 2020) [13]. Rogers used an S-shaped curve to demonstrate how innovations diffuse through a social setup. He explained that diffusion commences slowly at the initial stages, accelerates when a critical mass is attained, and levels off finally as fewer individuals remain to adopt.

Many advantages emanate with the diffusion of technological innovations in our place of work. The diffusion of computers and computer-based social network technology, including cell phones and cell phone-based SNT, has been of tremendous help when it comes to best practices. It has allowed countless businesses to be efficient in their daily operations in disseminating, storing, and retrieval of information. It has also provided some businesses a competitive edge in their industries. In recent times just after the Covid-19 Pandemic, many businesses, schools, and other entities have realized a great advantage of collaborating without being in the same physical environment, a phenomenon known as an integrated collaboration environment.

In many cases, managers and team members do not have to collocate to discuss business or accomplish a task. The same can be said of instructors and students. Regardless of the student's location, he or she can still have access to daily lessons without being in the brick-and-mortar classroom. All that is needed is access to the internet. There is also the savings on the cost of operations on the part of management. Rogers (1995) [12] said four main elements influence the diffusion of innovations. They include innovation, communication channels, time, and social systems. According to him, innovation could be how a new idea, object, or picture is perceived. Abu Jarad and Yusof (2010) submitted that innovation is the generating of a new idea in a new product or process. In service delivery organizations such as health care, innovation may be defined as actions, procedures, or methods of working to improve services, injecting efficiency, cutting down cost, and improving stakeholder experience (Greenhalgh *et al*., 2004) [11].

Diffusion of innovation depicts how a product or service gains momentum and is disseminated amongst a population (Van Mierlo, Li, Hyatt, & Ching, 2017) [15]. In their submission, Ali *et al*. (2021) [1] opined that diffusion of innovation theory ought to explain how the innovation becomes a regularly adopted practice within the clinic and change the perceptions of current staff and patients (Ali *et al*., 2021) [1]. In that case, the dissemination of information through multiple communication channels over time among individuals within a social system will achieve the intended health-related outcome. However, Dadich and Hosseinzadeh (2016) [7] opined that communication channels do not influence in shaping the way health care practitioners engage and use information.

The theory of performance (Campbell *et al*., 1993), on the other hand, elucidates how elements such as distraction and indiscipline affect the knowledge workers' performance. Campbell *et al*. (1993) submitted that core task proficiency, demonstrating effort, and maintenance of personal discipline can predict job performance. According to the writers, the typical view of job performance emphasizes the objective indicator of an individual accomplishment in the institution/organization. The rationalization for this characterization is that personal research used a single criterion of measurement for the most part of the century and that in scientific and professional literature, the term job performance is singular with no explicit or implicit conditionals. However, in their opinion, the search for objective indicators for measuring individual job performance has been a failure (Campbell *et al*.).

Campbell *et al*. (1993) said that to comprehend job performance, it is important to first appreciate the organizational goals. That is, the organizational goals dictate performance and not the opposite. For example, in a social club, members judge others based on their contributions toward the attainment of the club's goal—the Writers associated performance with behavior. According to them, performance is a measurable and observable behavior that is scalable in terms of individual ability, and it focuses on the achievement of organizational goals (Campbell *et al*.). It is what employees must do (Campbell *et al*.). It is not a trigger of action, but rather it is an action itself (Campbell *et al*.).

Performance constitutes actions in line with principal goals and is under an individual's control (Campbell *et al*., 1993). According to the writers, job performance is an aggregate of performance components that are unique in terms of what determines them and their relation with other variables.

Campbell *et al*. (1993) used eight factors to show the main performance components. The factors include job-specific task proficiency (i.e., executing tasks central to the job) and no-job-specific task proficiency (executing tasks that do not have much to do with your specific/prescribed job). For example, every registered professional nurse must be capable of taking a patient's vital signs, administering medication for the patient, and drawing blood, among other specific duties.

The third one is written oral communication task proficiency. It is a written and oral presentation to an audience. The fourth is demonstrating effort, which is a direct reflection of the consistency of a person's daily effort, the frequency with which individuals will surpass their own efforts when required, and a preparedness to keep working under difficult situations. The fifth is the maintenance of personal discipline, which underscores the avoidance of negative behavior such as staying on social networks and conversing with other people instead of working, substance abuse, sexual harassment. Personal discipline is more than just abiding by professional ethics and organizational norms. You may come across people who conduct themselves professionally and abide by all norms yet spend most of the time at work on activities that do not have anything to do with their job.

The sixth is facilitating peer and team performance, which is the degree to which the individuals provide support to their peers and act as real trainers. That depicts a good team player. The seventh factor is supervision/leadership. It includes all the behaviors focused on influencing the performance of subordinates. The eighth factor is management/administration. It includes performance behaviors directed at carrying out goals for the unit or enterprise and mobilizing people and resources to work on them. It also involves monitoring progress, helping to resolve problems/crises that tend to hinder the achievement of goals, controlling costs, obtaining extra resources, and being a representative of the unit when dealing with other units.

Among the eight factors, the critical performance components of every job include core task proficiency, demonstrated effort, and maintenance of personal discipline (Campbell *et al*., 1993). While Task proficiency is a subcategory of task performance, demonstrated effort and maintenance of personal discipline fall under contextual performance (Borman & Motowidlo, 1997; Motowidlo & van Scotter, 1994). This subcategorization suggests a multidimensional nature of performance. Motowidlo and van Scotter (1994) emphasized the importance of clearly

distinguishing between task performance and contextual performance.

2. Research method

The problem dealt with in the study was a drop in productivity resulting from the use of SNT by knowledge workers during working hours. Understanding the problem required determining and explaining the relationship between the use of SNT variables and knowledge worker productivity levels. A quantitative method was used in gathering and analyzing data. A web-based survey instrument was used to collect data. There were five sections (A, B, C, D, and E) of the instrument. The first three sections (A, B, and C) contain questions that measure SNT usage by knowledge workers (health care professionals). An internal consistency test yielded Cronbach's alpha score of 0.837. Section A contains six questions that measure the frequency of use of SNT by knowledge workers. Section B contains six questions that measure time spent on PC-based SNT by knowledge workers. Section C contains six questions measuring time spent on cellphone-based SNT. Section D of the instrument contains questions that measure knowledge worker productivity levels. The Hamilton Rating Scale for Depression, the Symptom Checklist 90 (SCL-90), the Clinical Global Impression Severity of Illness and Global Improvement Scale, and the Zimmerman Self-reported Scale to Diagnose Major Depression Disorder indicated a high correlation (0.27 – 0.61) among the measures. Section E, the last section of the instrument, contains 31 questions that measure the performance of knowledge workers. A reliability test of the EPA instrument yielded reliability coefficients of 0.934 and 0.923.

Targeted respondents were registered nurse-anesthetists. The total membership of the American Association of Nurse Anesthetists (AANA) was given by the secretariat as 46,870. Out of that number, 55% were female, and 45% were male. Because of the difference shown in the male and female population, a stratified random sampling was used to ensure an equal chance of selecting each member of the population. Stratified random sampling guarantees equal representation from each of the identified groups in the population (Leedy & Ormrod, 2010). Using G*Power 3.1.3 to calculate the sample size, with power of 0.8, effect size (f^2) of 0.15, and significance level of 0.05 suggested a sample of 85 participants for this study. Cohen (1988) recommended an effect size of 0.15, as a medium for a study designed to verify how the independent variable effectively predicts the dependent variable.

The AANA administrative and program assistant sent links to a self-administered questionnaire accompanied by letters explaining the purpose of the study, including participants' right to privacy by e-mail. Out of 1500 randomly chosen participants, 163 responded to the survey. Participation was voluntary and anonymous. Statistical Package for Social Sciences (SPSS) software was used to analyze the data collected. Data analysis commenced with correlation analysis between each paired SNT usage variable and the knowledge worker productivity level variable. It was followed by multiple regression testing for pairs that demonstrated a significant correlation.

3. Results

Half (61, 50%) of the sample was male, and a half was female (62, 50%). All of the participants (123, 100%) were working in the United States. The majority of the participants (113, 92%) had had a master's degree. It was followed by those (7, 6%) with an undergraduate degree, and those (3, 2%) with PhD degrees constituted the minority of the participants. Most participants (82, 67%) indicated that they were team members, followed by independent (29, 24%), team leaders (10, 8%), and administrators (2, 2%). The Frequencies and percentages can be found in Table 1.

Table 1: Frequencies and Percentages for Participant Characteristics

Characteristic	*N*	%
Gender		
Male	61	50
Female	62	50
Work in the US		
Yes	123	100
No	0	0
Level of education		
Undergraduate degree	7	6
Master's degree	113	92
Ph. D.	3	2
Role at work		
Administration	2	2
Team leader	10	8
Team member	82	67
Independent	29	24

Note: Percentages may not total 100 due to rounding error.

Cronbach's alpha values were used in determining reliability for the variables of interest followed by computation of alpha values for the SNT usage variables (frequency of use of SNT at work, duration of use of PC-based SNT, duration of use of cellphone-based SNT, and performance ratings) and knowledge worker productivity. Performance rating had seven subscales (Quantity of Work, Quality of Work, Job Knowledge, Initiative, Interpersonal Relationship, Dependability, and Potential) which called for the computation of alpha values for all of them. Guidelines established by George and Mallery (2010) helped in assessing alpha values. Reassessing alpha values below 0.71 led to the removal of items that were negatively influencing the scale. Frequency of use of SNT ($\alpha = 0.84$), duration of use of PC-based SNT ($\alpha = 0.88$), duration of use of cellphone-based SNT ($\alpha = 0.89$), and knowledge worker productivity ($\alpha = 0.89$) had alpha values that were acceptable. The subscales for performance ratings: Quantity of Work ($\alpha = 0.69$), Quality of Work ($\alpha = 0.81$), Interpersonal Relationship ($\alpha = 0.89$), Dependability ($\alpha = 0.78$), and Potential ($\alpha = 0.89$) also had acceptable alpha values. However, Job Knowledge ($\alpha = 0.33$) and Initiative ($\alpha = 0.60$) had unacceptable alpha values and could not be improved beyond 0.70, so that they were removed because they were negatively influencing the scale. Table 2 shows the first and second run of Cronbach's alpha values. Table 3 shows the items removed to improve the scales.

Table 2: Cronbach's Alpha Values for Scales of Interest

Scale	No. of items	α	Revised no. of items	A
Frequency of Use of SNT	6	0.84	6	0.84
Time spent on PC based SNT	6	0.88	6	0.88
Time spent on cell-phone based SNT	6	0.89	6	0.89
Performance ratings				
Quantity of work	5	0.45	2	0.69
Quality of work	5	0.28	2	0.81
Job knowledge	4	0.24	2	0.33
Initiative	4	0.39	2	0.60
Interpersonal relationship	4	0.51	2	0.89
Dependability	5	0.56	3	0.78
Potential	4	0.58	2	0.68
Knowledge worker productivity	16	0.89	16	0.89

Table 3: Individual Survey Items Removed to Create More Reliable Scales

Scale	Subscale item removed	Statement
Quantity of work	1	Does not consistently turn out a reasonable amount of work.
Quantity of work	2	Does just enough to get by. Almost never comes out with that little bit extra.
Quantity of work	3	Does an average amount of work consistently, but needs to be supervised.
Quality of work	1	Careless work. Work has to be checked. Undependable.
Quality of work	2	More than occasional mistakes. Does not consistently meet standards.
Quality of work	3	Few errors. Work only occasionally has to be corrected. Dependable quality.
Job knowledge	1	Does not know enough about the job to make contribution to the company.
Job knowledge	4	Thorough knowledge of overall job and virtually every detail.
Interpersonal Relationships	1	Sometimes upset others. Not skilled in human relations.
Interpersonal Relationships	2	Offers no cause for criticism. Accepted by coworkers.
Dependability	1	Unreliable. Excessive absence. Cannot be counted on.
Dependability	2	Requires little close supervision. Reliable.
Potential	1	Doubtful will become competent in present job.
Potential	3	Skilled worker now. Should be able to progress further.

I calculated the means and standard deviations on the variables of interest and created scores for frequency of use of SNT, duration of use PC-based SNT, duration of use of cellphone-based SNT by summing the corresponding items. Responses ranged from 0 - 24, where higher scores indicate greater time spent on SNT. Calculations of scores for the performance ratings involved averaging the items in the scale. Scale scores ranged from 0 - 4, where higher scores indicate more endorsement of the corresponding positive behavior. Scores for knowledge worker productivity involved summing responses to the 16 items. Responses ranged from 0 - 64. A high score indicated higher productivity. Means (M) and standard deviations (SD) for the scores are in Table 4.

Table 4: Means (M) and Standard Deviations (SD) for the Variables of Interest

Scale	*M*	*SD*
Frequency of use of SNT	3.49	3.40
Time spent on PC-based SNT	1.18	2.04
Time spent on cell-phone based SNT	2.93	3.04
Performance ratings		
Quantity of work	3.19	0.73
Quality of work	3.08	0.73
Job knowledge	2.74	1.04
Initiative	3.36	0.60
Interpersonal relationship	3.39	0.60
Dependability	3.49	0.48
Potential	3.24	0.73
Knowledge worker productivity	59.10	5.18

Results of the Tests of Hypotheses

Testing of each hypothesis started with Pearson correlation analyses between the SNT usage variables and knowledge worker productivity levels. Subsequent analyses included SNT usage variables, which showed a significant correlation to the knowledge worker productivity levels.

Hypothesis 1: Frequency of use of SNT and knowledge worker productivity levels. Hypothesis 1 was tested to determine the extent to which the frequency of use of SNT relates to knowledge worker productivity levels. The Pearson product-moment correlation coefficient between the two variables (frequency of use of SNT and knowledge worker productivity) was $r = 0.05$, $p = .557$, which indicates there was no statistically significant relationship between the variables.

Hypothesis 2: Duration of Use of PC-based SNT and knowledge worker productivity levels. Hypothesis 2 was tested to find out the extent to which the duration of use of PC-based SNT relates to knowledge worker productivity levels. The correlation coefficient, $r = 0.04$, $p = .665$, was statistically insignificant, which demonstrated the absence of a statistically significant relationship between the duration of use of PC-based SNT and knowledge worker productivity levels.

Hypothesis 3: Duration of Use of cellphone-based SNT and knowledge worker productivity levels. The intent of hypothesis 3 was to determine the extent to which the

duration of use of cellphone-based SNT relates to knowledge worker productivity levels. The correlation coefficient, r = 0.01, p = .964, was statistically insignificant, demonstrating the absence of a statistically significant correlation between duration of use of SNT and knowledge worker productivity levels.

Hypothesis 4: Performance rating and knowledge worker productivity levels. The purpose of hypothesis 4 was to examine the extent to which performance rating relates to knowledge worker productivity levels. The subscales used in measuring performance rating after adjusting the scale included Quantity of Work, Quality of Work, Interpersonal Relationship, Dependability, and Potential. Therefore, the investigation between the subscales of performance ratings and knowledge worker productivity levels involved five correlation analyses. Two out of the five correlation coefficients were statistically significant. The correlation between Quality of Work and knowledge worker productivity was significant, r (121) = .21, p = .018. The correlation between Potential and knowledge worker productivity was also significant, r (121) = .26, p = .004, showing a statistically significant relationship between Potential and knowledge worker productivity. Table 5 shows the results of the correlations.

Table 5: Pearson Product Moment Correlations between Potential Predictor Variables and Knowledge Worker Productivity

Variable	Knowledge worker productivity levels
Frequency of use of SNT	.05
Time spent on PC-based SNT	.04
Time spent on cell-phone based SNT	.01
Performance ratings	
Quantity of work	.06
Quality of work	.21*
Interpersonal relationship	.18
Dependability	.05
Potential	.26**

Note: *p < .05, **p < .01.

After the correlation analysis, a multiple linear regression was conducted to evaluate research questions one through four. The following is the formula for the regression model:

$$SA.sqrt = \beta_0 + \beta_1 * Quality + \beta_2 * Potential + error. \quad (2)$$

Where SA.sqrt represents the square root transformation of knowledge worker productivity, β_0 is the constant, β_1 is the regression coefficient for Quality of Work, and β_2 is the regression coefficient for Potential. The alternate and null hypotheses used in the regression model are as follows:

H_a4. A relationship exists between the performance rating and knowledge worker
productivity levels.

$H_0$4. A relation does not exist between the performance rating and knowledge
worker productivity levels

The predictor variables in the analysis were Quality of Work and Potential. The outcome variable was knowledge worker productivity. The regression model was significant, F (2, 120) = 5.31, p=0.006, R^2 = 0.08. Potential showed a significant relationship with knowledge worker productivity, b = 0.33, p = .048. The assumptions of the multiple linear regression were homoscedasticity, normality, and the absence of multicollinearity.

Normality

Normality was examined with a normal p-p plot and was not met (Fig 1). The deviation in normality led to data transformation. Tabachnick and Fidell (2012) recommend transforming variables with negative skew by a reflected square root (Equation 1). The following is the equation used to transform the knowledge worker productivity levels:

$$SA.sqrt = -1 * \sqrt{\max(SA) - SA} \quad (3)$$

The normal p-p plot indicated little deviation after reassessing normality (Fig 2).

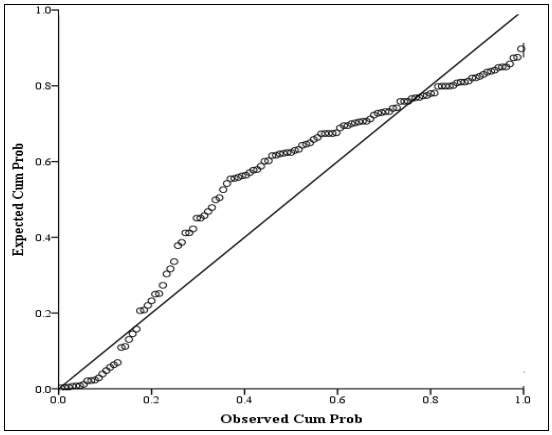

Fig 1: Normal p-p plot of residuals

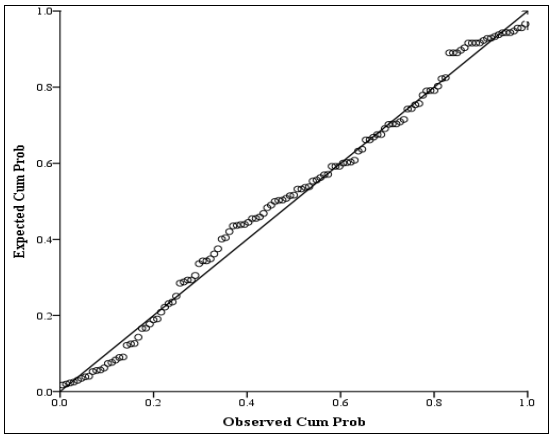

Fig 2: Normal p-p plot of transformed residuals

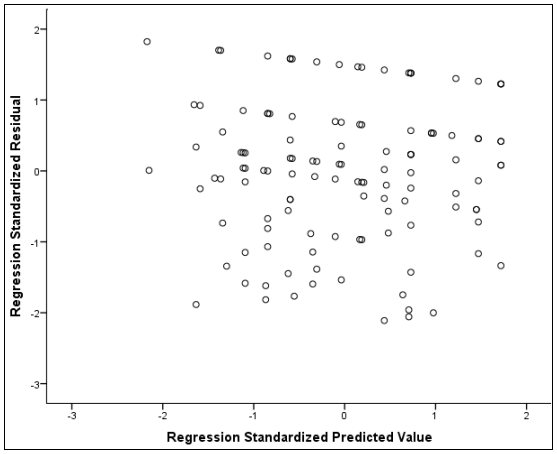

Fig 3: Residuals scatterplot to assess homoscedasticity

Homoscedasticity was determined with a residual scatterplot. The data were distributed in a rectangular arrangement about the regression line, implying the assumption was met (Fig 3). Evaluation of the absence of multicollinearity by examining variance inflation factors (VIF values) revealed that none of the values was greater than 2.0, confirming the assumption.

Multiple linear regression was conducted to determine if Quality of Work and Potential predicted knowledge worker productivity was significant, F (2, 120) = 5.31, p = .006, R^2 = 0.08, indicating the model predicts knowledge worker productivity. Subsequent examination of the individual predictors suggested that Potential was significantly related to knowledge worker productivity, b = 0.33, p = 0.048. For every one-unit increase in Potential, the square root of knowledge worker productivity increased by 0.33 units. As a result, only null hypothesis 4 ($H_0$4), relation does not exist between performance and knowledge worker productivity levels, could be rejected in favor of the alternative. Null hypotheses 1 ($H_0$1, r = 0.05), null hypothesis 2 ($H_0$2, r = 0.04), and null hypothesis 3 ($H_0$3, r = 0.01) could not be rejected. Results of the regression are in Table 6.

Table 6: Multiple Linear Regression with Quality of Work and Potential predicting Knowledge Worker Productivity

Variable	*b*	*SE*	β	*t*	*p*
Quality of work	0.25	0.16	0.15	1.51	.133
Potential	0.33	0.16	0.15	2.00	.048

4. Summary

The study was pursued to evaluate the relationship between the use of SNT and productivity among certified registered nurse anesthetists in the United States. It involved the determination of Pearson correlation analysis between four variables for the use of SNT and knowledge worker productivity levels.

A sample size of 123 was used. Half of the sample size (50%) was female, and the other half (50%) was male. The study took a period of two weeks. The educational background of the participants ranged from an undergraduate to a doctorate (Ph. D) degree. The participants also categorized themselves as administrators, team leaders, team members, and independent. The four research questions assessed in the study are as follows: (1) to what extent does the frequency of use of SNT relates to knowledge worker productivity levels? (2) To what extent does the duration of use PC-based SNT relate to knowledge worker productivity levels? (3) To what extent does the duration of use of cellphone-based SNT relate to knowledge worker productivity levels? (4) To what extent does performance rating relate to knowledge worker productivity levels? Four hypotheses were tested for the four research questions: hypothes1 (H1), hypothesis 2 (H2), hypothesis 3 (H3), and Hypothesis 4 (H4). The purpose of testing hypothesis1 (H1) was to determine the extent to which the use of SNT relates to knowledge worker productivity levels. Testing of hypothesis (H2) was to determine the extent to which the duration of use of PC-based SNT relates to knowledge worker productivity levels. Testing of hypothesis 3 (H3) testing was to verify the extent to which the duration of use of cellphone-based SNT relates to knowledge worker productivity levels. The purpose of testing hypothesis 4 (H4) was to determine the extent to which the performance rating related to knowledge worker productivity levels. There was no statistically significant correlation between the SNT usage variables and knowledge worker productivity levels as revealed by correlation analysis of hypotheses 1, 2, and 3. However, there was a significant correlation between the SNT usage variable of hypothesis 4 and knowledge worker productivity levels. Subsequent regression analysis using all the variables indicated that the SNT usage variable in hypothesis 4, performance, predicts knowledge worker productivity levels. As a result, the null hypothesis (H04) for research question 4 was rejected in favor of the alternate (Ha4). The other three null hypotheses (H01, H02, and H03) for research questions 1, 2, and 3, respectively were accepted.

5. Discussion and conclusion

Three out of the four null hypotheses were accepted after regression analysis followed by correlation analysis. For the first research question, correlation analysis conducted between frequency of use of SNT and knowledge worker productivity levels revealed no statistically significant relationship after testing Hypothesis 1 (H1). However, the results also indicated that the frequency of use of SNT (r =.05, p = 0.05) was positively related to knowledge worker productivity levels, which suggests that though there was no strong linear relationship, both variables increased or decreased in the same direction. One variable did not increase while the other decreased. In their study Chen, Ross, and Yang (2011) [6] unveiled that the desire to find diversion and entertainment on the Internet predicted the frequency of use of SNT for non-job-related activity while on the job. The writers recommended the setting of work-related goals at work to avoid any distractions by SNT.

Practical Implications

This study will help health care leaders in assessing and enacting policies that will help to enhance work productivity in the health care sector. An improvement in productivity in the health care sector will bring a positive social change in every community of the United States. It also has the potential to maximize profit for the health care sector.

Limitations

One limitation encountered in this study was the fact that the research focused only on certified registered nurse anesthetists in the United States who were members of the AANA. Knowledge workers in the health care sector include all health care professionals with formal education who use their mental power on the job and contribute to the intellectual property. Example doctors, registered nurses, pharmacists, and other technologists

6. Recommendations for further studies

1. Further study should focus on a qualitative design to explain the behavior or nature of the attributes of productivity when knowledge workers use SNT on the job.
2. Future studies can focus on the relationship between the use of SNT and knowledge worker productivity levels in a different industry or in a particular State.
3. There should be a replication of this study to substantiate the relationship between the use of SNT and productivity using a different set of population with a more balanced gender distribution.

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