



ELSEVIER

Available online at www.sciencedirect.com

SCIENCE @ DIRECT®

Computers in Human Behavior 21 (2005) 917–932

Computers in
Human Behavior

www.elsevier.com/locate/comphumbeh

An investigation the factors affecting MIS student burnout in technical-vocational college

Hui-Jen Yang ^{a,*}, Cheng Kiang Farn ^b

^a *Department of Information Management, National Chin-Yi Institute Technology, No. 35, Lane 215, Sec. 1, Chung-Shan Road, Taiping City, Taichung Hsien 411, Taiwan*

^b *Department of Information Management, National Central University, Taiwan*

Available online 2 April 2004

Abstract

Management information system (MIS) students are one of the most important information system (IS) employee sources. However, the determinants of student's burnout for MIS major students have received little attentions, despite their importance as indicator in predicting professional burnout and their working intention after their graduation and becoming IS professionals. This study explores the antecedents of student burnout for MIS major at technical-vocational college. Self-efficacy, social support, and sex-role were considered as antecedents to MIS student burnout. A questionnaire method by self-administered technique was used in this study. Multiple regression analysis was used to analyze the hypotheses. Statistical results displayed that MIS students with social support, self-efficacy and femininity have predictive power over student burnout. MIS students with social support and masculinity also have predictive power over self-efficacy.

© 2004 Elsevier Ltd. All rights reserved.

Keywords: Technical-vocational education; Student burnout; Self-efficacy; Social support; Sex-role

1. Introduction

Burnout is a syndrome of emotional exhaustion, depersonalization, and diminished personal accomplishment that occur among people-helping professions who do people work (Firth, Micntee, Mckown, & Britton, 1985; Golembiewski, Sun, Lin, &

* Corresponding author. Tel.: +886-04-2392-4505; fax: +886-4-2392-3725.

E-mail address: yanghj@chinyi.ncit.edu.tw (H.-J. Yang).

Boudreau, 1995; Jackson, Schwab, & Schuler, 1986; Lahoz & Mason, 1989; Schwab & Iwanicki, 1982). On the other hand, burnout is a negative state of physical, emotional, and mental exhaustion that is accompanied by a deep sense of failure from work. Maslach et al. (1981, 1996) developed the Maslach burnout inventory (MBI), to assess these three aspects of burnout, that is becoming widely used and has known psychometric properties (Maslach & Jackson, 1984). For each of these subscales, separate scores are provided for the frequency and intensity of feelings. These two dimensions have shown to be highly correlated when used with education related issues (Iwanicki & Schwab, 1981), hence, only the intensity dimension was assessed for this study.

Prior research indicated that college students have the middle to upper levels on burnout (Pines, Aronson, & Kafry, 1981). Existing research displays that if burnout results from expecting the environment to offer no valuable rewards or opportunities, then students and their teachers may burn out (Meier & Schmeck, 1985). Meier and Schmeck (1985) in their research they also pointed out that burnout students often lacked caring and are bored by the routine in classes. From prior research, the syndrome of student burnout is similar to people-helping employees. Student burnout can lead to higher absenteeism, lower motivation to do required course work, higher percentage drop out at college and so on (Ramist, 1981). Hence, in this study we define student burnout as “students in the learning process because of course stress, course load or other psychological factors cause a state of emotional exhaustion, a tendency of depersonalization, and a feeling of low personal accomplishment.”

Understanding the factors that influence people burnout has been a popular topic of psychological and neighboring disciplines’ research in the last few decades. Organizations and researchers found that burned-out employees reported, for instance, an increase in turnover, absenteeism, reduction in productivity, and decrease in human consideration (Cordes & Dougherty, 1993). Researchers provided empirical evidence of the internal or external factors that influence employee burnout in people-helping professionals such as social workers, nurses, probation officers, ministers, policemen, librarians, and poverty lawyers (Cherniss, 1980; Firth et al., 1985; Maslach, 1982; Schaufeli, Maslach, & Marek, 1993; Shirom, 1989). Information system (IS) professional’s burnout has been a problem area that has been investigated. Research evidence of Sethi et al. showed that burnout has related with IS professionals (Sethi, Barrier, & King, 1999). Management information system (MIS) students are one of the most important IS employee sources. If MIS students have a high burnout in their school learning periods, they are likely to be a high IS burnout professionals in their future working career. Gold, Bachelor, and Michael’s (1989) research supported that students’ burnout in teacher-training programs was an indicator in predicting teacher burnout and their working proficiency after graduation. The study of Pines et al. (1981) compared the burnout between university students and people-helping professionals and found that students had higher burnout than people-helping professionals. We, thus, infer if MIS students have a high burnout during their school education and training, then after they graduated, they have a greater

likelihood of becoming highly IS burnout employees. Therefore, understanding the factors causing MIS student burnout became a critical issue, because measuring student burnout may help to indicate student learning performance and potential college dropouts, as similar studies of professional burnout help to identify worker's working intention or intention to leave their jobs (McCarthy, Pretty, & Catano, 1990). Specifically, MIS students should simultaneously learn diverse knowledge and skills (management courses and computer courses) during their school careers. If MIS students have a high burnout in their computer related courses learning, they have a very greater percentage avoiding to be an IS professionals after their graduation. Most previous research regarding college students' burnout focused on the descriptive and demographic analysis (Gold et al., 1989; McCarthy et al., 1990). The studies of Meier and Schmeck (1985) and Pines et al. (1981) were focused on student burnout instruments measured and verified. Yet, very limited and scarce evidence existed supporting the presence of burnout in technical-vocational college students, especially for the skill-oriented MIS students.

Currently, the higher education systems in Taiwan have five-year junior college, two-year technical-vocational junior college, two-year technical-vocational senior college, four-year technical-vocational university, and four-year general university as shown in Table 1. Five-year junior college and two-year technical-vocational junior college do not lead to a bachelor degree. Two-year technical-vocational senior college, four-year technical-vocational university, and four-year general university have lead to a bachelor degree. When students graduated from junior high school and passed the five-year junior college entrance examination they are entitled to study at a five-year junior college. Students that have graduated from senior technical-vocational high school and passed the four-year and two-year technical-vocational junior college entrance examination can study at four-year technical-vocational universities or two-year technical-vocational junior colleges. Students that have graduated from two-year technical-vocational junior colleges and passed the two-year technical-vocational senior college entrance

Table 1
Higher education system in Taiwan

School system	Sources of students	Years of study	Diploma	Bachelor
Five-year junior colleges	Junior high school	5	Y	N
Two-year technical-vocational junior colleges	Senior vocational high school	2	Y	N
Two-year technical-vocational senior colleges	Two-year technical-vocational junior colleges	2	Y	Y
Four-year technical-vocational universities	Senior vocational high school	4	Y	Y
Four-year general universities	General high school	4	Y	Y

Note: Y, means YES; N, means NO.

examination can study at two-year technical-vocational senior colleges. Students that have graduated from general senior high school and passed the university entrance examination can study at a four-year general university.

Within these higher education systems, two-year technical-vocational junior and senior colleges are very special school system because these two kinds of school systems have only a two-year learning period. Sources of MIS students in two-year junior and senior technical-vocational colleges have a very diverse curriculum because they may not graduate from MIS major in senior vocational high school or two-year technical-vocational colleges. The aim of two-year technical-vocational colleges for MIS students is to train students to possess computer capabilities and management concepts during their school learning period. Students should finish all courses within two years. After they have graduated, they should be well-prepared displaying the necessary computer skills and management domain knowledge and are fully capable and ready to enter the job market. However, owing to the two-year time constraints, the courses are very complicated to design at these two types of school systems. Thus, within these two types of school systems MIS students have tight course schedules and tremendous pressure during their school learning periods. Generally, two-year technical-vocational junior and senior college MIS students should take 83 credits which computer related courses are about one-half of total credits within two years respectively, whereas, four-year university technical-vocational students only take 128 credits within four years. If students have failed any courses, two-year technical-vocational college or university MIS students have no time to make-up the failed courses within the two-year time period. They usually cannot graduate on time. Traditionally, two-year college junior and senior MIS students are also one of entry-level sources of IS employees. They should possess the computer capabilities and management concepts after they graduated. If they were to be burnout in the school, they would have a high possibility to be IS burnout employees.

The information, based on the aforesaid explanation, serves to motivate our intention to examine the fact that such inadequate lack of systematic research on MIS student burnout among two-year technical-vocational junior and senior colleges may raise some unanswered questions, such as: what internal and external factors influence MIS student burnout. Maslach et al. (1996) argued that the effects of internal and external variables on professional burnout should be considered. Maslach et al. (1985) and Maslach et al. (1996) noted that internal variables such as their level of self-efficacy and role of gender inequality could all impact professionals' burnout. Furthermore, Maslach et al. (1996) also suggested that external variables such as social support could influence professional burnout. Two questions will be addressed in this study. First, what is the relationship between social support, sex-role, and self-efficacy and their impact on student burnout? Second, what is the relationship between social support and sex-role on self-efficacy?

Below we review the existing research concerning social support, self-efficacy, and sex-role on student burnout in order to develop our hypotheses model.

2. Research model and hypotheses

2.1. *Social support*

Social support is usually defined as the existence or availability of people on whom we can rely, people who let us know that they care about, value, and love us (Sarason, Levine, Basham, & Sarason, 1983). Social support has been identified as a resource that enables individuals to cope with stress (House, 1981; Russell, Altmaier, & Van Velzen, 1987). Supports from one's co-workers and supervisors have been identified frequently as both a preventive mechanism and a remedy for burnout (Cherniss, 1980; Dignam, Barrera, & West, 1986; Pines & Maslach, 1978). Perceived adequacy of social support has repeatedly been found to relate positively to mental and physical health (Barrera, 1981; Fiore, Coppel, Becker, & Gary, 1986; Hirsch, 1980). Previous research suggested that increasing the social support available to teachers might be a useful strategy for preventing teacher burnout (Russell et al., 1987). Schwab and Iwanicki (1982) pointed out burned out teachers and students may influence each another, creating a downward spiral of decreasing satisfaction because students may possess the same feelings and expectancies of burnout experienced by their teachers. However, no empirical evidence concerning the impact of social support on burnout among students was found.

Additionally, Meier and Schmeck (1985) pointed out that burnout students often lacked caring and bored of routine in classes. We, therefore, presume that the higher the social support that the students have, the lower the burnout that the students have (experience). Thus:

H1. The greater the student's social support, the lower his/her burnout.

2.2. *Self-efficacy*

For the past decade or so, researchers have utilized the self-efficacy theory to explain the burnout phenomenon (Schaufeli et al., 1993). Bandura (1977) defined self-efficacy as "people's judgment of their capabilities to organize and execute courses of action required to attain designated types of performances." It is namely that self-efficacy is a strong predictor of subsequent task-specific performance, and the definitions of the construction ultimately refers to what a person perceives their capabilities to be, with regard to a specific task. Bandura (1977) found that self-efficacy positively correlates with behavioral changes both vicariously and emotively. Once self-efficacy had been formulated and established, it influenced the behavioral patterns to a magnitude of efforts the performer would exert to be. According to Bandura (1977), efficacy expectations were determinants in choosing activities.

Additionally, Bandura (1977) has also identified four major categories of experiences that determined efficacy beliefs: (1) mastery experience, which include one's pattern of success and failure at particular tasks or activities; (2) vicarious learning, or observation of other people's performance attainments; (3) social persuasion, involving the encouragement or discouragement that one receives from others when

engaged in particular activities; and (4) physiological states and reactions, including the pleasant or unpleasant emotional and physical sensations. Describing the relationship between burnout and physiological states, some previous researchers proved the relationships between self-efficacy and burnout (Cherniss, 1992, 1993; Hallsten, 1993; Hobfoll & Freedy, 1993). They proposed that people with no sense of mastery (i.e., self-efficacy), easily burnt out, and usually lacked the capabilities of adaptation. Based on the theory of self-efficacy and previous research cited above, we concluded that students who have greater self-efficacy, have a lower level of student burnout, leading to a positive learning attitude in school. Thus,

H2. The greater the student's self-efficacy, the lower his/her burnout.

Bandura (1977, 1986) defined verbal persuasion as “the belief, attitude, and behavior of people's judgment of their capabilities to complete the tasks.” In general, most people depend on other people's opinion to evaluate their own ability. They strive to attain a positive evaluation from others to enforce and enhance their self-efficacy. In other words, if the verbal persuasion is encouraging or supportive, and not commanding or forced upon, the verbal persuasion will enhance self-efficacy (Marakas, Yi, & Johnson, 1998). We therefore, conclude that parents, teachers or peer's support and encouragement have a positive relation on student's self-efficacy. This leads to:

H3. The greater the student's social support, the higher his/her self-efficacy.

2.3. *Sex-role*

Males and females have very different personal characteristics and abilities (Huber & Scaglione, 1995). Over several decades, sex-role identity has been researched as a possible psychological factor that might explain the gender difference (Baucom, 1983). Several sex-role inventories purporting to measure individual characteristics have been developed: (a) Bem sex-role inventory (BSRI) was developed by Bem who classified each individual as masculine, near-masculine, androgynous, near-feminine, or feminine, included 60 items (Bem, 1974); (b) the Personal Attributes Questionnaire was developed by Spence, Helmreich, and Stapp who revised Bem's classification and used median splits on the independent masculinity and femininity dimensions to generate four sex-role categories. These are masculine, feminine, androgynous, and undifferentiated (Spence, Helmreich, & Stapp, 1975); and (c) the PRF ANDRO based on Jackson's Personality Research firm (Berzins, Welling, & Welter, 1978).

In essence, sex-role identity usually encompass four dimensions classified by Bem (1974) and Spence et al. (1975) (1) masculine when they rated high on items assessing masculinity and low on those assessing femininity; (2) feminine when they rated high on femininity and low on masculinity; (3) androgynous rated high on femininity and high on masculinity; or (4) undifferentiated rated low on femininity and low on masculinity. Sex-role theory proposes that individuals possess one of four different

gender identities that allow for a range of behavioral patterns dependent on the said identity scale. People with a feminine or masculine trait would likely behave in stereotypically feminine or masculine ways because they unwittingly locked themselves into a narrowly defined self-concept. Androgynous people could adjust to feminine or masculine behaviors based on the particular situation. As to undifferentiated individual would behave in a non-gender-related manner (Chusmir & Koberg, 1991). Eichinger, Heifetz, and Ingraham (1991) modified Ben's sex-role scale to fit current environmental change. The aforesaid methods of sex-role classification were used as a guideline in the present study. Only the extreme polar feminine and masculine were studied for this research.

Depression is one phenomenon of the burnout (Weissman & Klerman, 1979). Culturally, high achievement and the suppression of emotion are the keystones of masculinity (Lemkau, 1984). Danker-Brown and Baucom (1982) has suggested that lower masculinity traits are more easily depressive than higher masculinity. Additionally, some researches used college students as samples to study burnout. They found that students with high femininity score get depression more easily, irrespective of female or male (Hammen & Peters, 1978). Therefore:

H4. The higher the student's masculinity, the lower his/her burnout; the higher the student's femininity, the higher his/her burnout, irrespective of female or male.

Traditionally, males are thought of as aggressive, strong, reasonable, confident, competitive, independent, and logical, which has the same meaning as masculinity. Females were thought of as shy, gentle, nurturing, neat, and dependent, which has the same meaning of femininity (Feather, 1984; Schein, 1972). On the basis of the existent research information base, masculinity proved to display a strong positive correlation with career self-efficacy, femininity was a negative correlation (Gianakos, 1995; Matsui, Ikeda, & Ohnishi, 1989). In view of these findings cited above, masculinity is positively related to MIS major students' self-efficacy. Masculinity was therefore hypothesized to exercise a strong positive influence on self-efficacy where femininity proves to have a deterring effect. Thus,

H5. The higher the student's masculinity, the higher his/her self-efficacy; the higher the student's femininity, the lower his/her self-efficacy.

In view of aforesaid points, the purpose of this study is to examine more thoroughly the effect of internal and external variables on student burnout. That is, this study attempts to draw on external and internal factors to identify a set of variables to provide a more comprehensive explanation of burnout in MIS students. Variables selected include two internal factors (sex-role and self-efficacy) and one external factor (social support). Each of these variables was important and recognized as a component in the study of burnout in professionals. Therefore, the main purpose of the current study was to examine the effects of sex-role, self-efficacy and social support on student burnout. Additionally, we also tested the relationships of social support and sex-role on self-efficacy. The

research framework tested was described in the previous sections and is shown in Fig. 1.

3. Method

3.1. Samples

Five hundred and seventeen sophomore students were chosen as samples, whose major are MIS and will graduate within one year, at six different two-year technical-vocational junior and senior colleges. Twelve classes located from the North down to the South of Taiwan. This was done to avoid any sampling bias. There are two good reasons for including only sophomore students in this study. First, students are expected to finish their degrees within two years, so the course schedules are very difficult to arrange justly within two-year technical-vocational junior or senior college. Students have very tight course schedules within these two years study and probably have high percentages of burnout phenomenon. Second, students have experienced at least more than one year of college courses, and should have been exposed to circumstance which may lead to burnout. They were asked to complete survey measures during a class period. Functional completed questionnaires were collected from 180 males and 337 females. Ten of the answer sheets were not completed, leaving a total of 507 students, 175 males and 332 females, and 99% of sampled students described themselves as 20 year of age or younger.

3.2. Instruments and procedures

Prior to data collection, researchers met with different school MIS teachers individually and privately to solicit their voluntary help to arrange students participating in this study. The survey used a self-administered technique. The questionnaires were mailed out to six college teachers who distributed it to 12 classes. Completed questionnaires were then mailed back to a college address individually.

The questionnaire included five sections. The first section assessed a student's background as well as basic demographic information such as gender, age, and school name. After finishing these questions, participants were then asked to complete a modified version of the BSRI (original scale was invented by Bem, 1974,

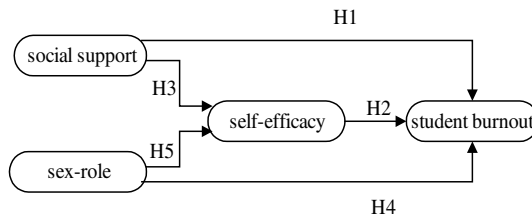


Fig. 1. Research model.

including 60 items), which contains 30 items on two sub-scales – femininity and masculinity and revised by Eichinger et al. (1991), using a 7-point scale to estimate the participants' sex-role traits from 1 (never agree) to 7 (completely agree).

Burnout was assessed using the modified version of Maslach burnout inventory (MBI) – general survey (Maslach & Jackson, 1981), which was modified by Meier and Schmeck (1985) to measure college student burnout. The instrument of burnout inventory contains 16 items for overall MBI scoring combining three subscales – emotional exhaustion, depersonalization, and personal accomplishment. Each item in these three subscales measured by a 7-point scale was from 1 (never be experienced) to 7 (experienced daily) to estimate students' burnout level.

The fourth section assessed a student's self-efficacy, which contained 8 items to estimate students' efficacy level from 1 (never agree) to 7 (completely agree). These items were adapted from research by Jones (Jones, 1986). On this scale, subjects were rated for general self-efficacy, not for specific domain's self-efficacy because MIS major students should study computer related courses and management courses simultaneously during their learning processes.

Social support was measured using 28 items in four subsections of peer support, teacher support, family support, and general support, to estimate student's own perceived degree of social support (Vaux et al., 1986). On this scale, it was a 23-item instrument originally, and additional five items of teacher support were designed in this study to fit in the school environment.

3.3. Reliability and validity of the measurement instrument

The content validity of the instruments was established through the adoption of the constructs that have been validated by several MIS researchers, and a pretest with 25 MIS major students during their summer course. In order to assess the reliability of the measurement instrument (Kerlinger, 1986), an internal consistency (Cronbach's α) test is conducted. The value of coefficient alpha higher than the threshold level of 0.7 was deemed as providing satisfactory reliability (Nunnally, 1978). Thus, internal reliability coefficients were calculated respectively, yielding evidence that the scales were reliable for these samples: 0.79 for student burnout, 0.84 for masculinity, 0.85 for femininity, 0.79 for self-efficacy and 0.88 for social support respectively. These scale reliabilities are indicated appropriate for field research since they are higher than the threshold of 0.7.

Discriminant validity was checked by means of factor analysis (Kerlinger, 1986). The measurement model using exploratory factor analysis (EFA) was assessed to check discriminant validity as shown in Tables 2 and 3 respectively. The steps of EFA were, in the beginning, using principal component analysis to process factor, then using Varimax as orthogonal rotation and eigenvalue equaling to 1 to get factor loading which should be greater than 0.5 (Kaiser, 1958). If an item with factor loading values not greater than 0.5, then the item had to be deleted and abandoned from further analysis. The result of burnout construct was displayed in Table 2. Among them, one item related to depersonalization had a loading of less than 0.5 and was deleted. The results of each construct of sex-role, social support and

Table 2
EFA of Burnout

Components	% of variance	Cumulative	Items deleted
Emotional exhaustion	29.447	29.447	None
Depersonalization	17.355	46.802	1
Diminished accomplishment	9.953	56.755	None

Table 3
EFA of social support, sex-role and self-efficacy

Components	% of variance	Cumulative	Items deleted
Social support	23.569	23.569	6
Masculinity	20.549	44.118	2
Femininity	7.071	51.189	5
Self-efficacy	4.881	56.070	2

self-efficacy were displayed in Table 3. Six items related to social support, two items related to masculinity, five items related to femininity, and two items related to self-efficacy have a loading of less than 0.5 and were deleted to fit the supporting literature (each item factor loading >0.5).

4. Results and discussion

4.1. Hypotheses testing

We examined these research questions in two steps. The first step was to examine the intercorrelations matrix between dependent variables and independent variables. This enabled us to check the relationship and multicollinearity between each of the independent variables and dependent variables. The second step was to carry multiple regression analyses to test hypotheses. Multiple regression analyses were chosen as an appropriate procedure to test the possible relationships among the variables identified as having an effect on self-efficacy and student burnout respectively. Social support and sex-role (masculinity and femininity) are hypothesized to influence self-efficacy respectively. In turn, self-efficacy, social support, and sex-role are hypothesized to affect student burnout respectively.

4.2. Intercorrelations matrix among variables

Table 4 displays means, standard deviations and the intercorrelations matrix between dependent variable and independent variables. The highest correlation of -0.511 occurred between student burnout and self-efficacy. The remaining correlations among independent variables ranged from $r = -0.215$ to $r = 0.396$ shown in

Table 4
Intercorrelations matrix among variables (Pearson correlation, Sig. two-tailed, $N = 507$)

Variables	Mean	SD	Burnout	Feminine	Masculine	Efficacy	Social support
Burnout	60.48	13.09	1.000				
Feminine	49.58	8.11	-.247***	1.000			
Masculine	53.69	12.09	-.206***	.217***	1.000		
Self-efficacy	22.26	5.45	-.495***	.162***	.362***	1.000	
Social support	113.86	16.46	-.353***	.351***	.183***	.223***	1.000

*** $p < 0.001$.

Table 4. These correlations implied that multicollinearity among independent variables was not a problem.

As indicated in Table 4, intercorrelations matrix shows that there was a significant correlation between student burnout and all the independent variables. Masculinity and femininity are negatively correlated with student burnout ($r = -.280$ and $r = -.224$, $p \leq 0.001$, respectively). This shows that sex-role socialization does relate to student burnout and have possessed lower burnout. Self-efficacy and social support are negatively correlated with burnout ($r = -.552$ and $r = -.363$, $p \leq 0.001$, respectively). The results indicate that the higher the social support and self-efficacy is respectively, the lower the student burnout.

4.3. Multiple regression for self-efficacy

Placing social support and sex-role in a multiple regression with self-efficacy as the dependent variable was tested. Table 5 shows that 39% of the variance and $F = 39.271$ ($p < .001$) in student burnout is explained by masculinity, femininity, and social support. As expected, social support is the most significant predictive variable for student self-efficacy, so H3 is supported. The result indicates that social support is significantly associated with self-efficacy. Following is masculinity in the next position, so H5 is partially supported. It showed a strong positive relationship

Table 5
Multiple regression for self-efficacy^a

Model	β	T	Sig.
Social support	.150	3.800	.000**
Masculinity	.327	8.649	.000***
Femininity	.039	.971	.332

^a Dependent variables: self-efficacy ($F = 39.271$, $p = .000$, $R^2 = 39\%$).

** $p < 0.01$.

*** $p < 0.001$.

Table 6
Multiple regression for burnout^a

Model	β	<i>T</i>	Sig.
Social support	-.224	-6.233	.000***
Masculinity	-.014	.398	.691
Femininity	-.101	-2.810	.005**
Self-efficacy	-.434	-12.063	.000***

^a Dependent variables: burnout ($F = 72.416$, $p = .000$, $R^2 = 59\%$).

** $p < 0.01$.

*** $p < 0.001$.

with both masculinity and self-efficacy. However, femininity is not significant for self-efficacy.

4.4. Multiple regression for burnout

The next set of analyses examines the relation between social support, self-efficacy, sex-role, and burnout among MIS students. Placing all the above variables in a multiple regression with burnout as the dependent variables is tested. The overall model is significant ($p < 0.001$). Table 6 illustrates the regression results of student burnout. Table 6 highlights the value of R^2 (.59) suggests that 59% of the variance at $F = 72.416$ ($p < .001$) in student burnout is accounted for by social support, masculinity, femininity, and self-efficacy. As expected, social support (β : -.217, Sig.: .000) is the most significant predictive variable for student burnout, followed by self-efficacy (β : -.462, Sig.: .000) as equally important in the next position for student burnout, so H1 and H2 are supported. Support from teachers, peers, and families were significantly associated with student burnout. Students with self-efficacy were also related to student burnout. Then, femininity comes next. These results are partially consistent with the main hypothesis, so H4 is partially supported. However, what was found in this study was the unexpected result that femininity has a negatively significant effect on student burnout (Danker-Brown & Baucom, 1982; Hammen & Peters, 1978; Weissman & Klerman, 1979). This result is not consistent with the hypothesis. This result showed that there is a strong negative relationship between femininity and student burnout. Masculinity has no significant effect on student burnout.

5. Limitations

Although the results provided fully or partially support for the hypotheses, three limitations should be taken into consideration when interpreting the findings. It is important to emphasize that the data from this study was gathered at one point in time, which was a kind of snapshot research that did not consider the feedback effect of student burnout over time. This research is categorized as cross-sectional research,

and, we therefore can not infer from our findings as integrated. An important area that future research should try to avoid this limitation, and it should focus on a longitudinal study over time to get integrated data and reduce the bias of the research. Second, we used a convenient, not a random, sample to select schools as testing samples, which may cause sampling bias. Third, the results of our study may have to be carefully interpreted since the sample was restricted to two-year technical-vocational junior and senior colleges MIS students. The results may not be generalizable to all school system's MIS major students.

6. Conclusion and implications

This paper initially discussed the factors influencing self-efficacy and student burnout from a social psychological perspective. At its beginning, we found that self-efficacy was influenced by social support, which is consistent with previous research (Bandura, 1977, 1986; Marakas et al., 1998). Sex-role is partially supported. Masculinity is significantly related to self-efficacy, but femininity is not significantly related to self-efficacy.

This research also demonstrates the relationship between social support, self-efficacy, and sex-role on MIS student burnout. Moreover, self-efficacy, social support, and femininity were found to be predictive of MIS student burnout in this study. Investigators in studies of other occupational groups such as teachers (Gibson & Dembo, 1984) have also found that teachers' self-efficacy has positive effects on the physical and mental health of teachers. These findings confirm the importance of self-efficacy on MIS student burnout. The result indicates that the education bureau and teachers should focus on innovative methods to increase MIS students' self-efficacy to reduce student's burnout level. On the other hand, the school system should provide some constructive methods and initiatives, such as verbal encouragement and praise from teachers, to raise students' self-efficacy to reduce student burnout and to promote learning performance.

The present findings also showed that social support was negatively associated with student burnout. This finding corroborates previous work that social support has positive effects on the physical and mental health of workers (House, 1981). The finding of this study indicated that a social support network could play a key role in assisting students in coping with burnout. Educational bureau or teachers should enhance the mechanism of social support to reduce student burnout.

The present result also confirms that sex-role plays a key constructive role in the study of burnout, by not focusing on gender inequalities, but on psychological gender differences. However, an unforeseen result found in this study is that femininity negatively effects burnout. This is not consistent with previous research, in which femininity positively affects burnout or depression (Danker-Brown & Baucum, 1982; Hammen & Peters, 1978; Weissman & Klerman, 1979). The argument is that students with femininity are probably more likely to release their emotions when they encountered the problems and are thus less at risk for burnout. Thus they have a lower level of burnout during school learning processes.

Indications, based on our research results, show that interventions to prevent or decrease college student burnout should not only focus on environmental factors (i.e., social support) but should also include student psychological personality traits such as sex-role and self-efficacy. In particular, this study suggests that both external and internal factors affect students' experience of burnout. Educational bureaus or schools should have some professionally founded programs to increase student self-efficacy or provide some support to two-year technical-vocational junior and senior college MIS students to avoid student burnout. Specifically, MIS students are an important pool of IS professional sources. They should learn a lot of computer related courses to build up their computer capabilities. If they are burnout in their school learning periods, even though they have graduated, they are probably disgust at IS jobs, which will cause the waste of educational resources. While they become an IS professionals unexpectedly, they still have a greater possibility of becoming highly burnout employees. Although this research aims at MIS major students, the results can also be generalized to other major students among two-year technical-vocational junior and senior colleges such as MBA, IE students etc.. These students should learn some computer courses in their major and also have their own characteristics and traits of social support, self-efficacy, and sex-role, which are the items to be measured in the research too. Therefore, understanding student burnout factors could alert the education bureau or school to be conscious of students' learning problems and to prevent it in time.

On the basis of this research, the future direction should focus on longitudinal work to investigate the dynamic contributing factors of student burnout, and providing more consistent and potent results than those of the cross-sectional research in this study.

Acknowledgment

This work was supported by the National Science Council of Taiwan, ROC under Grant No. NSC-89-2511-S-167-001.

References

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Barrera, M., Jr. (1981). Social support in the adjustment of pregnant adolescents: Assessment issues. In B. H. Gottlieb (Ed.), *Social networks and social support*. Beverly Hills: Sage.
- Baucom, D. H. (1983). Sex role identity and the decision to regain control among women: A learned helplessness investigation. *Journal of Personality and Social Psychology*.
- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology*, 42, 155–162.
- Berzins, J., Welling, M., & Welter, R. (1978). A new measure of psychological androgyny based on the personality research form. *Journal of Consulting and Clinical Psychology*, 46, 126–138.

- Cherniss, C. (1980). *Staff burnout: Job stress in the human services*. Beverly Hills, CA: Sage.
- Cherniss, C. (1992). Long-term consequence of burnout: An exploratory study. *Journal of Organizational Behavior*, 13, 1–11.
- Cherniss, C. (1993). The role of professional self-efficacy in the etiology and amelioration of burnout. In W. B. Schanfeld, C. Maslach, & T. Marek (Eds.), *Professional burnout: Recent developments in theory and research* (pp. 115–129). Washington, DC: Taylor & Francis.
- Chusmir, L. H., & Koberg, C. S. (1991). Relationship between self-confidence and sex role identity among managerial women and men. *Journal of Social Psychology*, 131(6), 781–790.
- Cordes, C. L., & Dougherty, T. W. (1993). A review and integration of resource on job burnout. *Academy of Management Review*, 18(4), 621–656.
- Danker-Brown, & Baucom, D. H. (1982). Cognitive influences on the development of learned helplessness: A primary test. *Journal of Personality and Social Psychology*, 43, 793–801.
- Dignam, J. T., Barrera, M., Jr., & West, S. G. (1986). Occupational stress, social support, and burnout among correctional officers. *American Journal of Community Psychology*, 14(2), 177–193.
- Eichinger, J., Heifetz, L. J., & Ingraham, C. (1991). Situational shifts in sex role orientation: Correlates of work satisfaction and burnout among women in special education. *Sex Roles*, 25, 425–430.
- Feather, N. T. (1984). Masculinity, femininity, psychological androgyny, and the structure of values. *Journal of Personality and Social Psychology*, 47, 604–621.
- Fiore, J., Coppel, D. B., Becker, J., & Gary, B. C. (1986). Social support as a multifaceted concept: Examination of important dimensions for adjustment. *American Journal of Community Psychology*, 14(1), 93–110.
- Firth, H., Mientee, J., Mckown, P., & Britton, P. G. (1985). Maslach burnout inventory: Factor structure and norms for British nursing staff. *Psychological Report*, 57, 147–150.
- Gianakos, I. (1995). The relation of sex role identity to career decision-making self-efficacy. *Journal of Vocational Behavior*, 46(2), 131–143.
- Gibson, S., & Dembo, M. H. (1984). Teacher efficacy: A construct validation. *Journal of Educational Psychology*, 76, 569–582.
- Gold, Y., Bachelor, P., & Michael, W. B. (1989). The dimensionality of a modified form of the Maslach burnout inventory for university students in a teacher-training program. *Educational and Psychological Measurement*, 49, 549–561.
- Golembiewski, R. F., Sun, B. C., Lin, C. H., & Boudreau, R. A. (1995). Burnout among Taiwanese police: A cross-cultural replication of the phase model. *Advances in International Comparative Management*, 10, 145–162.
- Hallsten, L. (1993). Burning out: A framework. In W. B. Schaufeli, C. Maslach, & T. Marek (Eds.), *Professional burnout developments in theory and research* (pp. 95–113). Washington, DC: Taylor & Francis.
- Hammen, C. L., & Peters, S. D. (1978). Interpersonal consequences of depression: Responses to men and women enacting a depressed role. *Journal of Abnormal Psychology*, 87, 322–332.
- Hirsch, B. J. (1980). Natural support systems and coping with major life changes. *American Journal of Community Psychology*, 8, 153–166.
- Hobfoll, S. E., & Freedy, J. (1993). Conservation of resource: A general stress theory applied to burnout. In W. B. Schanfeld, C. Maslach, & T. Marek (Eds.), *Professional burnout: Recent developments in theory and research* (pp. 115–129). Washington, DC: Taylor & Francis.
- House, J. S. (1981). *Work stress and social support*. Reading, MA: Addison-Wesley.
- Huber, B. R., & Scaglione, R. (1995). Gender differences in computer education: A Costa Rican case study. *Journal Educational Computing Research*, 13(3), 271–304.
- Iwanicki, E. F., & Schwab, R. L. (1981). A cross validation study of the Maslach burnout inventory. *Educational and Psychological Measurement*, 41, 1167–1174.
- Jackson, S. E., Schwab, R. L., & Schuler, R. S. (1986). Toward an understanding of the burnout phenomenon. *Journal of Applied Psychology*, 71(4), 630–640.
- Jones, G. R. (1986). Socialization tactics, self-efficacy, and newcomer's adjustments to organizations. *Academy of Management Review*, 29(2), 262–279.
- Kaiser, H. (1958). The Varimax criterion for analytic rotation of factors. *Psychometrika*, 23, 187–200.

- Kerlinger, F. N. (1986). *Foundations of behavior research* (3rd ed.). Forth Worth, TX: Holt, Rineheart and Winston.
- Lemkau, J. P. (1984). Men in female-dominated professions: Distinguishing personality and background features. *Journal of Vocational Behavior*, 24, 110–122.
- Lahoz, M. R., & Mason, H. L. (1989). Maslach burnout inventory: Factor structure and norms for USA pharmacists. *Psychological Report*, 64, 1059–1063.
- Marakas, G. M., Yi, M. Y., & Johnson, R. D. (1998). The multilevel and multifaceted character of computer self-efficacy: Toward clarification of the construct and an integrative framework for research. *Information Systems Research*, 9(2), 126–163.
- Maslach, C., & Jackson, S. E. (1981). *The Maslach burnout inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Maslach, C. (1982). *Burnout: The cost of caring*. Englewood Cliffs, NJ: Prentice-Hall.
- Maslach, C., & Jackson, S. E. (1984). Burnout in organizational settings. In S. Oskamp (Ed.), *Applications in organizational settings: Vol. 5. Applied social psychology annual* (pp. 133–154). Beverly Hills, CA: Sage.
- Maslach, C., & Jackson, S. E. (1985). The role of sex and family variables in burnout. *Sex Roles*, 12, 837–851.
- Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *Maslach burnout inventory manual*. Palo Alto, CA: Consulting psychologists Press Inc..
- Matsui, T., Ikeda, H., & Ohnishi, R. (1989). Relations of sex-typed socializations to career self-efficacy expectations of college students. *Journal of Vocational Behavior*, 35(1), 1–16.
- McCarthy, M. E., Pretty, G. M. H., & Catano, V. (1990). Psychological sense of community and student burnout. *Journal of college student development*, 31(May), 211–216.
- Meier, S. T., & Schmeck, R. R. (1985). The burned-out college student: A descriptive profile. *Journal of College Student Personnel*, 25, 63–69.
- Nunnally, J. C. (1978). *Psychometric theory*. (2nd ed.). New York: McGraw-Hill.
- Pines, A., & Maslach, C. (1978). Characteristics of staff burnout in mental health settings. *Hospital and Community Psychiatry*, 29, 233–237.
- Pines, A., Aronson, E., & Kafry, D. (1981). *Burnout: From tedium to personal growth*. New York: Free Press.
- Ramist, L. (1981). College student attrition and retention. *Findings (ETs)*, 6, 1–4.
- Russell, D. W., Altmaier, E., & Van Velzen, D. (1987). Job-related stress, social support, and burnout among classroom teachers. *Journal of Applied Psychology*, 72(2), 269–274.
- Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: The social support questionnaire. *Journal of Personality and Social Psychology*, 44(1), 127–139.
- Schaufeli, W. B., Maslach, C., & Marek, T. (1993). *Professional burnout: Recent developments in theory and research*. Washington, DC: Taylor & Francis.
- Schwab, R. L., & Iwanicki, E. F. (1982). Who are our burned out teachers? *Educational Research Quarterly*, 7(2), 5–16.
- Schein, V. E. (1972). The relationship between sex role stereotypes and requisite management characteristics. *Journal of Applied Psychology*, 59, 95–105.
- Sethi, V., Barrier, T., & King, R. C. (1999). An examination of the correlates of burnout in information systems professionals. *Information Resources Management Journal* (July-Sept), 5–13.
- Shirom, A. (1989). Burnout in work organizations. In C. L. Cooper & I. Robertson (Eds.), *International Review of Industrial and Organizational Psychology* (pp. 25–48). New York: Wiley.
- Spence, J. T., Helmreich, R., & Stapp, J. (1975). Rating of self and peers on sex roles attributes and their relation to self-esteem and conceptions of masculinity and femininity. *Journal of Personality and Social Psychology*, 32, 29–39.
- Vaux, A., Phillips, J., Holly, L., Thomson, B., Williams, D., & Doreen, S. (1986). The social support appraisals (SSA) scale: Studies of reliability and validity. *American Journal of Community Psychology*, 14(2), 195–219.
- Weissman, M. M., & Klerman, G. L. (1979). Sex differences and the epidemiology of depression. In E. S. Gombert & V. Franks (Eds.), *Gender and disordered behavior*. New York: Brunner/Mazel.