

# Predicting Teachers' Computer Use for Own Needs, Teaching, and Student Learning

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### Abstract

This study predicted teachers' use of computers for their own needs, teaching, and student learning from five groups of factors: demographics, self-confidence, self-competence, value, and computer-related experience. The sample consisted of 80 teachers enrolled in non-computer inservice courses who completed a questionnaire. Interestingly, only value factors were found to be significant predictors for all three computer uses. Value of computers for personal needs was the most important predictor for teachers' own use and a significant predictor for use in teaching while the value of computers for improving students' skills was a significant predictor for both teaching and student learning uses. Self-confidence also played an important role in predicting teachers' computer use, being the most important predictor of computer use for teaching and a significant predictor of own use. Self-competence, while playing a lesser role, was the most important predictor of computer use for student learning. Surprisingly, neither demographics such as age or gender nor computer-related experience were significant predictors for any of the three uses. A progression of use for own needs, to teaching, and finally student learning was clearly evident. Suggestions for teacher development programs are provided.

## Predicting Teachers' Computer Use for Own Needs, Teaching, and Student Learning

Over the course of their careers, teachers develop knowledge about themselves, specifically beliefs about their own knowledge and skills. These beliefs originate from a variety of sources such as educational courses or workshops, teacher educators, peers, as well as past and present learning experiences. Teachers judge the relative merits of these sources and develop a belief system about teaching and learning [1].

Teachers' own perceptions and self-schemas are important to consider in relation to their content knowledge and actual behavior. Research has suggested that teachers' self-knowledge or general beliefs can influence their skills in coping with the demands of teaching and their ability to learn how to use new teaching strategies [2, 3]. At the same time, teachers' beliefs can be viewed as a direct influence upon their classroom behavior. In other words, these beliefs follow teachers into their own classrooms. This may result in teachers using and acting upon their beliefs in their teaching.

Many people widely recognize that computers are useful in the overall educational enterprise. Educators too have recently emphasized the need for expanding curricula to include computer instruction. The rationale is that knowledge about computers is necessary for students to function in a technological society. Yet, successfully changing any educational practice necessitates the development of favorable teacher beliefs. A possible source of limited enthusiasm for computers exhibited by some teachers may be that they see the suggested applications of computers and associated educational demands as unrealistic with little payoff [4]. What may appear to be a desirable goal in principle must be viewed as desirable by the teachers concerned before an educational issue such as computers in education can be implemented quickly and effectively into classroom practice [5]. Successful computer use, then,

may be dependent upon teachers' beliefs about educational computing and whether they feel they can use computers effectively.

Yet, educators are not solely interested in computer literacy for students, but also in using computers as instructional tools to assist in their own teaching and the learning processes of students. Moreover, one cannot dismiss the possibility that educators may also use computers for their own personal needs or that beliefs related to their own use of computers may influence their use of computers for teaching or student learning.

The purpose of this study was to identify important factors in predicting teachers' use of computers for their own needs, their teaching, and student learning. Five groups of factors were considered: demographics, self-confidence, self-competence, value, and experience. Results from this study will benefit teacher educators who teach inservice courses by suggesting important factors that may impact teachers' use of computers. Moreover, the results can be utilized in the staff development of practitioners to facilitate learning and development of computer use in education.

### Literature Review

The growing body of literature associated with educational computer use has examined numerous variables and interrelationships in order to gain a better understanding of computer beliefs and use of computers within education. Although a few studies have examined the relative importance among different factors in predicting teachers' computer use [6, 7], researchers appear not to have included factors related to teachers' use of computers for their own needs. Yet, at the same time, one cannot ignore the importance that general factors such as demographics or experience may have in predicting teachers' use of computers.

## Demographics

The relationship between age and computer-related beliefs or behavior appears to be uncertain at best. Although some studies have found no relationship between teachers' age and either computer-related professional training [8] or attitudes [9], Marcinkiewicz [7] found older teachers had more computer experience. With respect to preservice teachers, Woodrow found no relationship between age and either computer attitudes [10, 11], computer literacy [12], word processing experience [13], or programming experience [13], but did find that younger preservice teachers had more computer experience [10, 12]. Likewise, Hunt and Bohlin [14] found that younger preservice and inservice teachers had more favorable attitudes and more experience in word processing, programming, and recreational uses of computers.

Like age, gender is one of the most common factors investigated in relation to computer beliefs. While some studies have found no significant relationship between gender and computer-related attitudes, those studies that have found a significant relationship generally found that males had more favorable attitudes than females. For example, Loyd and Gressard [15] found no gender differences in teachers' attitudes towards liking computers or their perceived usefulness but did find that males had significantly less anxiety and greater confidence in using computers. Similar ambiguity exists for studies involving preservice teachers as well. Although Woodrow [10-13] found no correlation between gender and either computer attitudes, experience, or literacy, Kay [16] found that males had greater computer literacy, more experience, and a greater commitment to use computers. Yet, at the same time, Kay [16] found no relationship between gender and computer attitudes.

Although teaching experience has not been investigated as extensively as either age or gender, no clear conclusions can be drawn as to its relationship with computer use or behavior.

While Chiero [6] found that years of teaching experience was a significant predictor in using computers for preparing lesson plans, Cates and McNaul [8] found no significant differences in computer-related coursework and inservice training based on teaching experience.

### Self-Confidence

A number of studies have found a relationship between confidence and computer use. The importance of confidence in explaining computer beliefs is largely due to its inclusion as an attitude subscale by Loyd and Gressard [17]. Hunt and Bohlin [14] found that the confidence subscale of Loyd and Gressard [17] was predicted by computer use for recreation, and experience in word processing, programming, and databases. Similarly, Nash and Moroz [18] found that Loyd and Gressard's confidence subscale [17] explained 32% of the variance in scores measuring intensity of computer usage. In addition, Zammit [19] not only found that non-users rated a lack of self-confidence first among factors that hindered their use of computers but found a significant difference in self-confidence between users and non-users.

### Self-Competence

While self-confidence and self-competence appear not to be well differentiated in the literature, nonetheless studies have found significant relationships between measures of self-competence and either computer use or attitudes. Marcinkiewicz [7, 20] found that self-competence was not only significantly related to teachers' and preservice teachers' level of computer use but was the strongest predictor of levels of computer use for teachers. Similarly, McInerney, McInerney, and Sinclair [21] found that self-competence was significantly related to lower levels of computer anxiety in education students.

## Value

The importance of value as a predictive factor of actions and behavior owes its origins to motivation theory. In earlier models, value was conceived in terms of the incentive value of pride or inhibitive value of shame that an individual attached to success or failure of tasks, respectively [22]. More recent models have conceptualized value in broader terms related to usefulness or relevance [23].

In terms of usefulness, value has been an important component in measuring computer attitudes [24-26]. Zhang and Espinoza [27], for example, found that usefulness was significantly related to university students' desire to learn computing skills as well as their confidence and comfort in working with a computer. With respect to teachers, usefulness has not only been significantly related to computer use [14, 18] but also to computer experience [15].

Research studies have also investigated value in terms of the general relevance of computers for teaching and students. Marcinkiewicz [7] found that while relevance of computers for teaching was significantly related to teachers' self-competence in using a computer, it was not a significant predictor of their level of computer use. Marcinkiewicz [20] did find, however, that relevance was a significant predictor for preservice teachers' level of computer use. In terms of students, Zammit [19] found that the need for students to learn how to use technology was the fourth most important factor in facilitating computer use by teachers who used computers.

Expanding upon the concept of relevance, Keller [28] operationalized value into three subconditions: value for own needs, career, and others. Using this model, Kellenberger [29] found that the value of computers for preservice teachers' own needs and career together were significantly related to their perceived computer self-efficacy. In addition, Kellenberger [30] found that the value of computers for preservice teachers' own needs, career, and future students

were the best predictors of perceived computer use under differential access to computer resources.

### Experience

Researchers have operationalized experience in a number of ways: self-perceptions [29, 30], temporal use [7, 31, 32], numeral use [14], and frequency of use [32]. Interestingly though, the relationship between experience and either computer beliefs or behavior appears to be somewhat unclear. While Hunt and Bohlin [14] found that experience was significantly correlated with computer attitudes, Woodrow [10, 11, 13] did not. Marcinkiewicz [7] found that experience was significantly correlated with innovativeness and self-competence but not levels of use. Similarly, Kellenberger [29, 30] found that experience-related factors were not significant predictors of preservice teachers' perceived computer use.

Experience can also be gained through formal courses, workshops or home computer use. Studies have found that preservice teachers who took a computer course felt more prepared to use computers in teaching [33] and had reduced anxiety [21]. However, Cates and McNaull [8] found that only some types of classroom computer uses were significantly related to teachers' course and workshop contact time. Yet, Zammit [19] found that offering more inservice courses was the third most important factor that would encourage non-users to start using computers. Moreover, in Marshall and Bannon's [34] sample of students, teachers, administrators, and librarians, owning a home computer was a significant effect for affective attitudes and computer knowledge but not cognitive attitudes.

### Computer Uses

Similar to experience, use has been operationalized in a number of ways: Marcinkiewicz [7, 20] categorized levels of use (nonuse, utilization, and integration), Chiero [6] investigated

specific teacher tasks, and Mitra [35], who summarized different conceptualizations of computer use, focused on tasks driven by specific and unique motivations for computer use. Recognizing the relevance of all three approaches and research related to motivation [28], this study examined three areas of teacher computer use: use of computers for teachers' own needs, their teaching, and student learning. Inclusion of teachers' use of computers for their own needs is not only relevant from a motivational viewpoint but may also aid in the development of a generalizable conceptual framework explaining educationally related computer uses by teachers.

## Method

### Sample

The sample consisted of 80 teachers enrolled in a Faculty of Education inservice program at a southwestern Ontario university in Canada. Teachers enrolled in computer-related inservice courses were excluded from the study to avoid sampling bias and allow greater generalization of the results.

### Instrument

A questionnaire developed by the researchers served as the data collection instrument. The questionnaire consisted of six sections with all items measured on a 5-point Likert-type scale except where noted.

#### Demographics

The information in this section asked respondents to indicate their gender, age, and number of years of teaching experience.

#### Self-confidence

Self-confidence may be described as feeling self-assured or self-reliant. This section consisted of five items that ranged from "not confident" to "very confident". The first three items

asked participants to indicate their self-confidence in using a computer in general, for personal needs, and for work. The last two items asked subjects to indicate their self-confidence in gaining new computer knowledge and new computer skills.

### Self-competence

Self-competence may be described as being capable or effective in carrying out tasks. This section consisted of three items that ranged from “not competent” to “very competent”. Here, teachers were asked to indicate their self-competence in: (1) using a computer to assist them with their own teaching needs not directly related to student use, (2) using a computer to individualize students’ needs, and (3) integrating computers in classroom instruction.

### Value

These seven items consisted of value components related to teachers’ perceived importance or usefulness of computers [1, 23, 28]. The first four items asked teachers how valuable computers were for: their own personal needs, creating instructional support materials, classroom instruction in general, and individualizing students’ needs (adapted from Kellenberger [29, 30]). The three remaining items asked teachers how valuable computers were for improving students’: knowledge, development of various skills, and motivation to learn. All items ranged from “not valuable” to “very valuable”.

### Experience

The first item in this section asked teacher to indicate how much experience they felt they had using a computer ranging from “no experience” to “a lot of experience” (adapted from Kellenberger [29, 30]). The second item asked teachers to indicate whether they had a home computer. The final two items asked teachers to indicate how many computer-related university

credit hours they had taken and how many hours they spent taking workshops related to computers over the past two years (adapted from Cates & McNaull [8]).

### Computer uses

This section consisted of three subsections that focused on teachers' use of a computer for: their own needs, their teaching, and student learning. Items in each of these three subsections were based on uses believed to best represent the various ways in which teachers used computers. Items ranged from "not often" to "very often". The items in each subsection were summed resulting in three scores, one for each of the aforementioned uses.

Items related to own use asked subjects to indicate how often they used computers for: (1) leisure, (2) hobbies/interests, and (3) personal needs. The resultant score ranged from 3 to 15.

Items related to the use of computers for teaching asked subjects to indicate how often they used computers to: (1) prepare instructional materials, (2) prepare newsletters to parents, (3) prepare school-related reports/schedules, (4) evaluate software/hardware, and (5) communicate with other teachers. The score ranged from 5 to 25.

In relation to computer use for student learning, teachers were asked to indicate how often they used computers for: (1) class demonstrations, (2) educational games, (3) individualizing students' needs, and (4) integrated student activities. The summed score ranged from 4 to 20.

### Procedures

Inservice instructors were contacted to confirm their permission to gather data in their class. The questionnaire was then distributed to teachers during each class visit. Although participation in the study was voluntary, the response rate was 93%. Anonymity was guaranteed.

Teachers were asked to answer the questions honestly and to leave blank those questions that they did not wish to answer.

### Research Design and Analysis

The three dependent variables in this study were the summed scores for the three types of computer uses: own use, teaching use, and student learning. Each of the aforementioned items related to demographics, self-confidence, self-competence, value, and experience were used as independent factors. Stepwise multiple linear regression served as the primary statistical procedure in which a variable was entered when the probability-of-F-to-enter was less than or equal to 2.5% and removed when the probability-of-F-to-remove was greater than or equal to 5%.

## Results

### Descriptive Statistics

Of the 80 teachers in the sample, most were female (87% female, 13% male). They ranged in age from 23 to 53 years with a mean age of 30 years. On average, teachers had three and a half years of teaching experience. Interestingly, most teachers owned a home computer (84%). The possible ranges, means, and standard deviations of the three dependent variables and remaining independent factors are presented in Table 1. Overall, teachers felt quite confident in using a computer for their own personal needs. In addition, teachers appear to have felt more competent in using a computer for their teaching needs compared to using a computer to individualize students' needs or integrating computers in classroom instruction. Not surprisingly, teachers believed computers were valuable for improving students' motivation to learn.

-----Insert Table 1 about here-----

### Correlations

Groups of strong correlations reflected items of similar focus (see Table 2). For example, the strong correlations among self-confidence items and between self-confidence items and self-competence associated with teaching needs focused on teachers and their work. Similarly, perceived experience was strongly correlated with only general, personal, and work-related self-confidence and self-competence items. The strong correlations among value items specifically associated with instruction and students reflected a classroom focus.

-----Insert Table 2 about here-----

The intercorrelation of computer use items was particularly interesting. Use of computers for own needs was strongly correlated with use for teaching needs. Likewise, use of computers for teaching needs was strongly correlated with use for student learning. Yet, the correlation between use of computers for own needs and use for student learning was not particularly strong, although it was statistically significant at the 5% level.

The lack of strong correlations was also noted. Except for perceived experience, experience and demographics items were generally not strongly correlated with other predictors or computer uses.

### Multiple Regression Analyses

Table 3 shows a summary of the stepwise regression analyses for factors predicting the three types of computer uses. For each factor found to be statistically significant in each step of the regression, the unstandardized coefficient ( $B$ ), standard error of the unstandardized coefficient ( $SE B$ ), and standardized coefficient ( $\beta$ ) are presented. The multiple correlation coefficient squared ( $R^2$ ) for the first step and change in the multiple correlation coefficient

squared ( $\Delta R^2$ ) for each subsequent step are also indicated. Tolerance protection of .30 was used to prevent excess multicollinearity.

-----Insert Table 3 about here-----

Only five factors were significant in predicting the three computer uses: value of computers for personal needs, value for improving students' skills, self-confidence using a computer for personal needs, self-confidence using a computer for work, and self-competence using a computer to individualize students' needs. Together, these factors provided strong predictions ( $R^2_{\text{total}} > .40$ ) for each type of computer use. Moreover, value-related factors were significant predictors for each of the three computer uses. Interestingly, neither demographics such as age, gender, or years of teaching experience, nor any of the computer experience factors was a significant predictor for any of the computer uses.

### Discussion

Teachers' comfort in using a computer may follow a sequential progression. In this study, teachers' self-confidence in using a computer for their personal needs appears to have been higher than other self-confidence items such as those related to work. Consequently, confidence may originate in teachers' use of computers for their personal needs. Moreover, teachers appear to have felt more competent using a computer for their teaching needs compared to student or instructional needs. Therefore, self-competence in using a computer for work not directly related to student use may be needed before self-competence can be gained in using a computer in the classroom.

Evidence of this progression from own needs, to teaching, and finally student learning was also found in the intercorrelation among computer uses. Computer use for teachers' own needs was strongly correlated with computer use for teaching needs, which, in turn, was strongly

correlated with computer use for student learning. However, computer use for teachers' own needs was not strongly correlated with use of computers for student learning. Yet, using a computer for teaching needs may be the intermediate step bridging own use and student learning use.

Teachers felt that computers were very valuable for improving students' motivation. The motivational aspects of computers may originate from several sources. First, this motivation may arise from the new and advanced uses of computers that students see in their environment. Second, since computer games are extremely popular, students may associate classroom computer use with playing games. Third, computers may have been used as a reward for students' good behavior or superior work. Regardless though, teachers obviously perceive that computers improve students' motivation.

Interestingly, demographic items were neither significant predictors of computer uses nor strongly correlated with other predictors. Although some studies have found that age [14], gender [16], or years of teaching experience [6] were related to computer use, this study did not. Instead, this study supports most of Woodrow's findings [10-13] and those of Cates and McNaull [8].

Like demographic items, none of the computer-related experience items was a significant predictor of computer uses. Yet, three aspects need to be highlighted.

One, although perceived experience was not a significant predictor of computer uses, unlike other experience-related items, perceived experience was strongly correlated with other beliefs and moderately correlated with own use and teaching use. Consequently, perceived experience appears to be a more useful means of operationalizing experience compared to actual measures.

Two, ownership of a home computer was not strongly associated with either favorable beliefs or more frequent computer uses. Although many teachers in the sample owned a home computer, the computer may have been used largely by their spouse or children.

Three, computer-related course and workshop experience was not strongly correlated with beliefs or uses either. Overall though, teachers in the sample had some exposure to computers through university courses and workshops. Perhaps, as Karsten and Roth [32] suggest, the content or approach of courses and workshops may be more important than the quantity.

From the regression analyses, value factors were significant predictors for all three computer uses. This supports the findings of Hunt and Bohlin [14] as well as Nash and Moroz [18]. Although Marcinkiewicz [20] found that relevance was both a significant predictor of preservice teachers' level of use and significantly correlated with teachers' level of use, relevance was not a significant predictor of teachers' level of computer use. From this study, however, value was found to play a major role in predicting teachers' computer use for their own needs and a minor role in the use of computers for teaching and student learning.

Value for personal needs accounted for 41% of the variance in computer use for teachers' own needs and an additional 5% of the variance for teaching use over that already explained from the other two predictors. Moreover, value for personal needs was almost as strongly correlated with teaching use as self-confidence in using a computer for work, which was the strongest predictor of teaching use. The importance of the value of computers for personal needs in predicting computer use supports Kellenberger's findings [29, 30].

The value of computers for improving students' skills was the other significant value-related predictor found, accounting for an additional 14% of the variance of teaching use and an additional 8% of the variance of student learning use over that already explained from the

first predictors. Again, this supports Kellenberger's study [30] in which value for future students was a significant predictor for computer use under differential access to three computer resources. Yet, results from this study suggest that the value of computers for students is associated specifically with improving their skills.

Self-confidence in using a computer for work was the strongest predictor of teaching use, accounting for 35% of the variance. This supports the work of other researchers [14, 18, 19]. This study, however, sheds light as to specifically what types of uses self-confidence may be related. That is, self-confidence was only a significant predictor of teaching use and not own use or use of computers for student learning.

Similar to Marcinkiewicz's study [7], this study found that self-competence was the strongest predictor of using a computer for student learning, accounting for 35% of the variance. Yet, results from this study suggest that self-competence related specifically to individualizing students' needs appears to be important. Moreover, results from this study may explain why Marcinkiewicz [20] found that relevance was the strongest predictor of preservice teachers' level of computer use while self-competence was the strongest predictor of teachers' level of computer use. The present study found that value, or relevance, was a significant predictor of own use and teaching use but not use for student learning. One may assume that preservice teachers would likely use computers more for their own needs and teaching needs than for student learning due to their limited exposure to students. Moreover, this study found that self-competence was a significant predictor of computer use for student learning, a type of use which teachers would have great exposure.

## Implications

Although further studies are needed to verify the proposed progression from own needs, to teaching, and finally student learning, nonetheless, inservice courses and workshops may account for this in their program design. Programs might begin by having teachers determine which personal needs they feel can be met by a computer using a needs assessment model similar to the one suggested by Ragsdale [4]. Guidance can then be given to not only help teachers determine how computers can address these personal needs but to actually follow through in the implementation. Once teachers realize how valuable computers can be for their own needs and have used computers for such purposes, staff development programs may shift their attention to teaching uses. Such uses may include simple tasks at first such as searching the web for lesson plans or ideas, using spreadsheets or databases for recording students' progress, producing newsletters using publishing software, or using E-mail to communicate with other teachers. Once teachers become self-confident in using the computer for work, staff development programs may then finally focus on using a computer for student learning. In this way, the concern raised by Ragsdale [4] that teachers may perceive computers and their associated educational demands as unrealistic with little payoff can be addressed.

The value of computers specifically for improving students' skills was important in predicting teaching and student learning uses. The student skills that teachers have in mind may be computer-related skills, realizing the value for students to gain computer skills in order to function in a technological society. If so, inservice courses and workshops might pay particular attention in addressing computer-related skills that students would find useful in the future such as searching and retrieving information from the Internet using search engines and online databases. On the other hand, these skills that teachers have in mind may be general learning

skills or skills specific to subject areas. In this case, staff development programs might focus on higher-level thinking skills developed in simulation software. Although further studies are needed to determine which type of skills teachers perceive computers are valuable in developing in students, nonetheless one cannot argue that computers have value in developing both types of skills.

Self-competence in using a computer to specifically individualize students' needs was important in predicting the use of computers for student learning. Moreover, unlike other factors that were correlated with own use and teaching use, this predictor was by far the most strongly correlated factor of student learning use. Consequently, when staff development programs reach the proposed final stage in addressing the use of computers for student learning, some attention should be focused on how computers can be used to individualize students' needs. The exposure to software that allows for various levels of skill may play a crucial role here. This aspect appears to be particularly common in language and mathematics software. Fortunately, teachers probably spend much class time in developing language and mathematics skills, particularly in elementary grades. Yet, inservice courses and workshops might also expose teachers to software that allows some individualization of student needs in other subject areas. Moreover, such training might also develop teaching skills in using general software applications, such as web page editors, to tailor learning based on students' needs or interests.

The inclusion of teachers' use of computers for their own needs clearly aided the development of a generalizable conceptual framework. Value of computers for personal needs and improving students' skills were important predictors for the three types of computer uses. Moreover, evidence of a progression from own use, to teaching use, and finally use of computers for student learning emerged. This should provide teacher educators with valuable information in

designing and implementing inservice courses and staff development programs, particularly where resistance to educational technology may exist.

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**Table 1. Possible Ranges, Means, and Standard Deviations for Computer Uses and Self-Confidence, Self-Competence, Value, and Experience Factors**

| Variable   | Possible Range | Mean  | Standard Deviation |
|--|----------------|-------|--------------------|
| <i>Computer Use: Own Needs</i>                       | 3-15           | 10.13 | 3.52               |
| <i>Computer Use: Teaching</i>                        | 5-25           | 15.76 | 4.94               |
| <i>Computer Use: Student Learning</i>                | 4-20           | 11.59 | 4.42               |
| <i>Self-Confidence: General</i>                      | 1-5            | 3.63  | .96                |
| <i>Self-Confidence: Personal Needs</i>               | 1-5            | 4.04  | .90                |
| <i>Self-Confidence: Work</i>                         | 1-5            | 3.71  | .99                |
| <i>Self-Confidence: Gain New Knowledge</i>           | 1-5            | 3.76  | .95                |
| <i>Self-Confidence: Gain New Skills</i>              | 1-5            | 3.76  | .96                |
| <i>Self-Competence: Own Teaching Needs</i>           | 1-5            | 3.66  | .99                |
| <i>Self-Competence: Individualize Student Needs</i>  | 1-5            | 2.94  | 1.10               |
| <i>Self-Competence: Integrating Into Instruction</i> | 1-5            | 3.13  | 1.09               |
| <i>Value: Personal Needs</i>                         | 1-5            | 3.93  | 1.04               |
| <i>Value: Creating Instructional Material</i>        | 1-5            | 3.88  | .98                |
| <i>Value: Classroom Instruction</i>                  | 1-5            | 3.28  | .89                |
| <i>Value: Individualize Student Needs</i>            | 1-5            | 3.43  | 1.03               |
| <i>Value: Improve Student Knowledge</i>              | 1-5            | 3.84  | 1.00               |
| <i>Value: Improve Student Skills</i>                 | 1-5            | 3.68  | .94                |
| <i>Value: Improve Student Motivation</i>             | 1-5            | 4.04  | .95                |
| <i>Experience: Perceived Experience</i>              | 1-5            | 3.61  | .78                |
| <i>Experience: University Credit Hours</i>           | N/A            | 4.41  | 11.88              |
| <i>Experience: Workshop Hours</i>                    | N/A            | 3.84  | 10.66              |



|                     | <i>Demographics</i> |       |               | <i>Self-Confidence</i> |                 |              |                |                | <i>Self-Competence</i> |                |                | <i>Value</i>    |                |                |                |               |                 |                | <i>Experience</i> |              |               |               | <i>Computer Use</i> |               |                |  |
|---------------------|---------------------|-------|---------------|------------------------|-----------------|--------------|----------------|----------------|------------------------|----------------|----------------|-----------------|----------------|----------------|----------------|---------------|-----------------|----------------|-------------------|--------------|---------------|---------------|---------------------|---------------|----------------|--|
|                     | Genr                | Age   | Tchg<br>Exper | Genl<br>Needs          | Persnl<br>Needs | Work<br>Know | Comp<br>Skills | Comp<br>Skills | Tchg<br>Needs          | Stdnt<br>Needs | Integ<br>Instr | Persnl<br>Needs | Instr<br>Mater | Class<br>Instr | Stdnt<br>Needs | Stdnt<br>Know | Stdnt<br>Skills | Stdnt<br>Motiv | Percd<br>Exper    | Home<br>Comp | Univ<br>Cr Hr | Wksp<br>Hours | Own<br>Needs        | Tchg<br>Learn | Stdnt<br>Learn |  |
| <i>Value</i>        |                     |       |               |                        |                 |              |                |                |                        |                |                |                 |                |                |                |               |                 |                |                   |              |               |               |                     |               |                |  |
| Persnl<br>Needs     | .15                 | -.10  | -.18          | .53**                  | .46**           | .50**        | .38**          | .30**          | .51**                  | .38**          | .36**          | 1.00            |                |                |                |               |                 |                |                   |              |               |               |                     |               |                |  |
| Instr<br>Mater      | .03                 | -.01  | -.04          | .53**                  | .33**           | .48**        | .30**          | .31**          | .50**                  | .39**          | .48**          | .64**           | 1.00           |                |                |               |                 |                |                   |              |               |               |                     |               |                |  |
| Class<br>Instr      | .01                 | .03   | .01           | .33**                  | .19             | .25*         | .28*           | .26*           | .37**                  | .49**          | .56**          | .37**           | .46**          | 1.00           |                |               |                 |                |                   |              |               |               |                     |               |                |  |
| Stdnt<br>Needs      | .15                 | .18   | .15           | .23*                   | .06             | .19          | .17            | .15            | .31**                  | .38**          | .44**          | .38**           | .38**          | .70**          | 1.00           |               |                 |                |                   |              |               |               |                     |               |                |  |
| Stdnt<br>Know       | .10                 | .09   | .04           | .21                    | -.04            | .04          | .05            | .02            | .24*                   | .22            | .27*           | .31**           | .39**          | .62**          | .66**          | 1.00          |                 |                |                   |              |               |               |                     |               |                |  |
| Stdnt<br>Skills     | .26*                | -.01  | -.16          | .22                    | .04             | .13          | .12            | .09            | .17                    | .36**          | .36**          | .37**           | .33**          | .58**          | .67**          | .75**         | 1.00            |                |                   |              |               |               |                     |               |                |  |
| Stdnt<br>Motiv      | .23*                | .11   | .10           | .28*                   | .12             | .15          | .22            | .13            | .35**                  | .24*           | .29*           | .28*            | .30**          | .55**          | .67**          | .67**         | .65**           | 1.00           |                   |              |               |               |                     |               |                |  |
| <i>Experience</i>   |                     |       |               |                        |                 |              |                |                |                        |                |                |                 |                |                |                |               |                 |                |                   |              |               |               |                     |               |                |  |
| Percd<br>Exper      | .13                 | .15   | .15           | .70**                  | .61**           | .62**        | .49**          | .43**          | .60**                  | .35**          | .39**          | .46**           | .36**          | .21            | .18            | .10           | .07             | .14            | 1.00              |              |               |               |                     |               |                |  |
| Home<br>Comp        | -.24*               | -.11  | -.04          | -.18                   | -.25*           | -.25*        | -.07           | .01            | -.19                   | -.17           | -.15           | -.13            | -.24*          | -.01           | .03            | -.04          | .03             | -.02           | -.15              | 1.00         |               |               |                     |               |                |  |
| Univ<br>Cr Hr       | .11                 | -.09  | -.18          | .14                    | .15             | .13          | .13            | .12            | .08                    | .19            | .12            | .17             | .21            | .24*           | .20            | .10           | .21             | .17            | .04               | -.10         | 1.00          |               |                     |               |                |  |
| Wksp<br>Hours       | .09                 | .37** | .23*          | .09                    | .04             | .17          | -.04           | -.05           | .19                    | .20            | .07            | .15             | .14            | .12            | .20            | .12           | .21             | .09            | .15               | -.13         | .08           | 1.00          |                     |               |                |  |
| <i>Computer Use</i> |                     |       |               |                        |                 |              |                |                |                        |                |                |                 |                |                |                |               |                 |                |                   |              |               |               |                     |               |                |  |
| Own<br>Needs        | .08                 | -.11  | -.14          | .48**                  | .50**           | .45**        | .29**          | .24*           | .37**                  | .37**          | .33**          | .59**           | .32**          | .14            | .06            | .10           | .21             | .02            | .49**             | -.27*        | .06           | .21           | 1.00                |               |                |  |
| Tchg<br>Learn       | .24                 | .03   | .07           | .54**                  | .45**           | .60**        | .42**          | .40**          | .53**                  | .58**          | .43**          | .60**           | .49**          | .42**          | .45**          | .32**         | .45**           | .28*           | .43**             | -.14         | .22           | .31*          | .64**               | 1.00          |                |  |
| Stdnt<br>Learn      | .18                 | .16   | .10           | .15                    | .12             | .35**        | .21            | .18            | .23                    | .59**          | .43**          | .31*            | .18            | .45**          | .45**          | .31*          | .46**           | .30*           | .19               | .01          | .15           | .31*          | .28*                | .63**         | 1.00           |  |

\* $p < .05$

\*\*  $p < .01$

**Table 3. Summary of Stepwise Regression Analyses for Factors Predicting Computer Uses**

| Computer Use     | Regression Step               | Significant Factor(s)                                | <i>B</i> | <i>SE B</i> | $\beta$            |
|------------------|-------------------------------|--|----------|-------------|--------------------|
| Own Needs        | 1 ( $R^2 = .41^{**}$ )        | <i>Value</i> : Personal Needs                        | 2.24     | 0.34        | 0.64 <sup>**</sup> |
|                  | 2 ( $\Delta R^2 = .05^*$ )    | <i>Value</i> : Personal Needs                        | 1.80     | 0.38        | 0.51 <sup>**</sup> |
|                  |                               | <i>Self-Confidence</i> : Personal Needs              | 0.96     | 0.41        | 0.25 <sup>*</sup>  |
| Teaching         | 1 ( $R^2 = .35^{**}$ )        | <i>Self-Confidence</i> : Work                        | 2.79     | 0.51        | 0.59 <sup>**</sup> |
|                  | 2 ( $\Delta R^2 = .14^{**}$ ) | <i>Self-Confidence</i> : Work                        | 2.57     | 0.46        | 0.55 <sup>**</sup> |
|                  |                               | <i>Value</i> : Improve Student Skills                | 1.87     | 0.49        | 0.38 <sup>**</sup> |
|                  | 3 ( $\Delta R^2 = .05^*$ )    | <i>Self-Confidence</i> : Work                        | 1.99     | 0.50        | 0.42 <sup>**</sup> |
|                  |                               | <i>Value</i> : Improve Student Skills                | 1.49     | 0.49        | 0.30 <sup>**</sup> |
| Student Learning | 1 ( $R^2 = .35^{**}$ )        | <i>Value</i> : Personal Needs                        | 1.27     | 0.53        | 0.27 <sup>*</sup>  |
|                  |                               | <i>Self-Competence</i> : Individualize Student Needs | 2.28     | 0.42        | 0.59 <sup>**</sup> |
|                  | 2 ( $\Delta R^2 = .08^{**}$ ) | <i>Self-Competence</i> : Individualize Student Needs | 1.96     | 0.41        | 0.51 <sup>**</sup> |
|                  |                               | <i>Value</i> : Improve Student Skills                | 1.32     | 0.49        | 0.29 <sup>**</sup> |

\* $p < .05$ <sup>\*\*</sup>  $p < .01$