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Computer Attitude, Use, Experience, Software Familiarity and Perceived Pedagogical Usefulness: The Case of Mathematics Professors

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Abstract

As the pedagogical-effectiveness of information technology (IT) in mathematics education is carefully established the topic of discourse among mathematicians and mathematics educators is no longer a dispute about whether or not to use IT in the teaching and learning of mathematics but a shift to some debate about the when and how of its usage. Under this dispensation, both researchers and educators have emphasized the role that teachers' attitudes toward information technology play as a crucial factor in the successful use of computers in the teaching and learning of mathematics. In this paper, we seek to study and examine the attitude of mathematics professors toward computers. In addition, the paper also investigates the effects of age and computer experience on computer attitude, usage, software familiarity, and perceived pedagogical usefulness. The broader perspective of the paper has drawn its input from more than fifty five percent (55%) of the mathematical sciences faculty of King Fahd University of Petroleum & Minerals who participated in a survey conducted as feedback for the paper. Measurement tools deployed in this regard were a slightly modified Computer Attitude Scale (CAS) by Loyd & Gressard (1986), and the Pedagogical Use (PU) unit of the Computer Attitude Scale for Teachers (CAST) by Yuen & Ma (2001). The acquired data was analyzed using an analysis of variance (ANOVA). Although both ANOVA and Duncan multiple comparison revealed that Age and computer experience did not affect attitudes towards computers and their pedagogical usefulness, the raw data nonetheless does shown some trend towards that. From the result, one can conclude that mathematics professors not only have positive attitude towards computers, but are fully convinced of the positive role that computers can play in the teaching and learning of mathematics. The only aggravating factor is the technical know-how and concomitant experience that are essential in guiding pedagogical activities towards effective and proper utilization of these technologies.

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1. Introduction:

> In the industrial and consumer societies of the world, micro-chip technology is rapidly becoming all-pervasive; wherever one looks one finds more and more examples of its applications. In daily life microtechnology is something one uses, it is a tool for achieving ones objectives more quickly, more cheaply or more efficiently. It even facilitates things which, ten years ago, would have been considered impossible. Such developments must be reflected in our schools (Blease, 1986:3).

Computers have been used in education for more than four decades, and they have now been accepted "unconditionally" as an integral part of our entire educational system. The increase in computer use is rapid and has also generated new challenges. Perhaps more than other fields, mathematics as a subject is thought to have benefited and established a stronger intrinsic link with the development of computers in recent times. Nonetheless, Kadijevich (2002) has identified four issues as critical to proper and effective use of computer technologies in the mathematics classroom. Top among them is computer attitude, followed by software selection and a proper utilization direction, and Web-based professional development of mathematics teachers. Similarly, in his meta-analysis of the factors that are instrumental in promoting the use of computer aided learning, Griffin (1988) found that teacher attitude towards computers is an important factor related to the teacher's role towards the effective use of computers in education. Indeed, previous correlation studies have long forecasted that the use of computers in education would very much depend on how well teachers integrate them in everyday activities. The question of teacher attitude toward computers is central to any successful use of computers in education (Loyd & Loyd, 1985; Kluever et al., 1994; Yuen & Ma, 2001). However, despite the attitudinal factor identified above, Yuen & Ma (2001) have noted that very little attention has been given to this factor in actual teaching practice.

Not unlike any other innovation, teachers initially resisted the use of computers in education. As a matter of fact, the term "computerphobia" and "computer anxiety" were coined and entered in the literature vocabulary due to teacher (not student) resistance to computer use. The causes of this resistance according to Nickerson (1983) are not unconnected with feelings of stupidity, fear of obsolescence, fear of the unfamiliar, and the thought that computers have a dehumanizing effect.

Studies have shown that computer anxiety, lack of confidence, and lack of enjoyment influence both the acceptance of computers and their use as a teaching and learning tool (Loyd &

Gressard, 1986; Smith & Kotrlik, 1990; Woodrow, 1991; Fletcher & Deeds, 1994). The need to therefore disabuse the minds of teachers from such fears and replace these misconceptions with confidence building measures is ever more paramount. In this regard, computer ownership and computer experience are two very important and interrelated factors that can help in mitigating fear and anxiety about computers from the minds of mathematics teachers and help to develop their confidence. With computer ownership, the teacher is guaranteed total access and freedom to experiment with the use of a computer as the machine tool that it is. With ownership, there then comes the reciprocal relationship of computer experience that provides the technical-know-how and the intellectual ability to manipulate and discover the pedagogical power of the machine. The importance of these two facts has been echoed and reiterated in many studies that encapsulate the argument about the effectiveness of computer use in teaching. Loyd & Gressard (1984) have put it more succinctly:

> *"it is becoming increasingly evident that familiarity with computers and the ability to use them effectively will be of critical importance to success in many different fields. Computer experience is therefore gaining wide recognition as crucial component of the educational process." (p.67).*

It has been noted that, due to the lack of training and experience, "even when computers are available, mathematics teachers rarely use them in their educational practice" (Kadijevich, 2002). Limited computer experience has been found to be a factor that influences anxiety (Loyd & Gressard, 1986). Lack of training and experience is also believed to be, in part, the reason why many teachers have not been well-disposed to computers and consequently deprived of their usefulness in the classroom (see Collins, 1996). Once computer-trained, teachers with computer experience will be less inclined to doubt the usefulness of the computer in their classroom. Thus the perceived usefulness of computers does clearly influence attitudes toward computers, and the amount of confidence a teacher possesses in using computers also influences the implementation of acquired skills in the classroom (Bandura, 1977; Gressard & Loyd, 1985; Yuen & Ma, 2001). The forgoing underlines the calls often made for personal education in computer technology, and promoting computer literacy for both learners and instructors within educational institutions (Jay, 1981).

Some studies have investigated the relationships between computer attitude, age and experience but findings have been contradictory (Gressard & Loyd, 1984; Loyd & Loyd, 1985; Pope-Davis & Twing, 1991). However, there has been little information related to mathematics professors,

especially with regard to their experience, frequency of use, software familiarity, and perceived pedagogical usefulness of the computer in the mathematics classroom. This study aims at providing insight in that direction. The paper is divided into four parts. After the introduction in the first part, the second part discusses the research methodology, while the third part will carry an analysis of the results followed by some discussion and, finally, the concluding remarks together with the summary and recommendations.

2. Methodology

2.1 Sample

The data of this study was collected from 41 of 72 faculty members of the Mathematics Department at King Fahd University of Petroleum & Minerals. The age ranges of the participants are summarized in the following table:

Table I

Age Ranges of the Participants

Age Ranges	**Frequency**
23 -30	5
31 – 40	7
41 – 50	11
51 -55	16
More than 55	2
Total	**41**

2.2 Instruments

The two instruments used in this study were: the forty-item Computer Attitude Scale (Loyd and Loyd,1985), and the modification of the pedagogical usefulness (PU) unit of the Computer Attitude Scale for Teachers (CAST) by Yuen & Ma (2001). Most of the questions in the latter were modified and some were localized to mathematics. All the questions present statements of attitude towards computers and their use. The reliability coefficient was found to be .90, .89, .89, and .82 for Computer Anxiety, Computer Confidence, and Computer Liking subscales, while the total score was estimated as .95 (Loyd & Loyd, 1985). Subsequent studies have yielded similarly

high internal consistency scores (Nash & Moroz, 1997). For the second instrument, the positive effect of the pedagogical usefulness of computers in teaching and learning on teacher usage in instruction was reported by Yuen & Ma (2001). However, they conclude that the "standardized coefficient beta is 0.044 and was not alone statistically significant directly to the overall usage". Other questions in the questionnaire include:

1. Computer Experience: The subjects were asked about their experience with learning about or working with computers with five ranges: 1 year or less, 2 – 3 years, 3 – 4 years, 4 – 5 years, and more than five years.
2. The frequency of computer use with choices: everyday, a few times a week, a few times a month, a few times a year, and not at all.
3. The purpose of computer use with choices: e-mail, Internet, word processing and spreadsheets, programming, and other research purposes.
4. How often they use computers in teaching, and how often they use computers in preparing for their lessons, and how often they give their students homework/assignments that will require the use of computers. The ranges are: every week, a few times in each semester, sometimes in some semesters, and never.
5. Familiarity with frequently used software such as: word processors (e.g. MS word, LaTEX, etc), spreadsheet and statistical packages (e.g. MS Excel), Presentation programs (e.g. PowerPoint), computer algebra systems (e.g. Mathematica, Matlab, Maple etc), programming languages (Fortran, C, C++, Java etc.), and Internet design software (e.g. FrontPage). The ranges here were: excellent, good, average, poor, and very poor. Also, the respondents were asked to indicate for which of these programs they would like to have more training for the enhancement of their research.

2.3 Procedures

Subjects in the present study were given the questionnaire at the beginning of the semester. The data was analyzed using the statistical packages SAS and SPSS. The level of statistical significance (alpha level) was set at .05.

3. Results and Discussion

The results of this study are summarized below followed by discussion:

1. **Summary of the Attitude**

Table II		
Summary of the means and standard deviation of the subscales		
Subscale	Mean	Standard Deviation
Computer Anxiety	35.39	4.15
Computer Confidence	34.93	4.89
Computer Liking	31.63	4.76
Computer Usefulness	33.41	4.05
Pedagogical Usefulness	19.17	3.85

In general, the results of this study suggest that mathematics professors at King Fahd University of Petroleum & Minerals (KFUPM) have fairly positive attitudes toward computers. This is consistent with the results of other similar studies carried out with teachers and educators (see Loyd & Loyd, 1985; Gressard & Loyd, 1986; Park & Gamon, 1995; Robb, 1996; Nash & Moroz, 1997; Yuen & Ma, 2001).

2**. Computer Experience**

Table III		
Experience with learning about or working with computers	Number	Percentage
1 year or less	0	0%
2 – 3 years	0	0%
3 – 4 years	3	7%
4 – 5 years	4	10%
More than 5 years	34	83%
Total	**41**	**100%**

In terms of years of use and working experience with computers, the results show that most of the mathematics faculty at KFUPM (over 80% of the respondents) has been using computers for more than five years. Contrast this with Loyd and Gressard (1986) who derived experience values as: (a) none, (b) less than six months, (c) six months to one year, and (d) more than one year. With this range, Loyd and Gressard found a link between experience and computer anxiety. That is to say, teachers with more than one year of experience were significantly less anxious than those with less experience. Therefore, the lack of computer anxiety shown by the mathematics faculty in this study may be associated with their years of experience in working with computers, with 83% having more than five years of experience in working with computers.

3. **Frequency of Computer Use**

Table IV Frequency of computer use		
Frequency of computer use	Number	Percentage
Everyday	40	99%
A Few times a week	1	1%
A Few times a months	0	0%
A Few times a year	0	0%
Not at all	0	0%
Total	**41**	**100%**

The frequency of computer use, Table IV, shows that 99% of the faculty use computers every day in one way or another. This shows how pervasive the use of computer has become in our daily, personal, and profession life and, therefore, "such developments must be reflected in our schools" (Blease, 1986:3), because our students will soon graduate and join the workforce.

4. **The Purpose of Computer Use**

Here respondents are allowed to make more than one choice.

Table V The Purpose of Computer Use		
Area of computer use	Number	Percentage
E-mails	41	100%
Internet	39	95%
Word processing & spreadsheet	32	78%
Other research purposes	25	61%
Programming	19	46%

Table V shows how intensively the faculty use computers for e-mail communication and Internet surfing. More than 95% of the faculty use computers for e-mail or Internet purposes. More than 60% use computers for word-processing and other research purposes. Programming takes the smallest factor with 46%, and this is understandable since only a few faculty members, who work in the area of numerical analysis and applied mathematics, use some programming in their work.

5. **Frequency of the Use of Computers in Teaching**

Table VI Frequency of Computer Use in Teaching		
Every week	16	39%
Few times each semester	8	20%
Sometimes in some semester	13	32%
Not at all	2	5%
Total	**39**	**96%**

In terms of computer use in teaching, the results in tables VI show that less than 40% of the faculty use computers in teaching on a weekly basis. It is important to note that this result includes the instructors of Math 001 and 002 and Stat 319, in which the weekly computer lab period is almost compulsory. This means that in the bulk of other courses that most of the engineering students are required to take, such as the calculus series, very few faculty use computers in teaching. Since this is a common phenomenon (see, for example, Manoucherhri, 1999), many studies have identified some of the many reasons for the reluctance of teachers to

integrate computers into their teaching. A major factor affecting the implementation of educational change in general, as seen by Fullan (1982), is teacher perception of the efficacy of the change. Another major reason has been found to be the lack of a curricular imperative for this (Heywood & Norman, 1988) i.e. teachers need to see the reason behind any changes in their teaching methods (Robb, 1996). Other reasons include: lack of time, tight schedules, too much material to be covered, a rigid syllabus to be followed, lack of knowledge of how to use computers in teaching, and possibly faculty perception of computers as being a tool for communication, information, and research only, and not as a teaching and learning tool.

The data in Table IV shows how intensively the mathematics faculty use computers on a daily basis. In fact, the trend is indicating that our students today will live and work in an era dominated by computers, by worldwide communication, and by a global economy. Therefore, to have students adequately prepared for these challenges, computer-based technology should be routinely used at schools and universities (Steen, 1989; Pelton & Pelton, 1998), especially in mathematics classes.

6. **Frequency of Use of Computers in Preparation for Teaching**

Table VII Frequency of Computer Use in Preparing for Teaching		
Every week	22	54%
A few times each semester	10	24%
Sometimes in some semester	9	22%
Not at all	0	0%
Total	**41**	**100%**

This also shows how useful computers are in helping the preparation and organization of lectures in one way or another.

7. **Frequency of Work Assigned to Students Requiring Computer Usage**

Table VIII Frequency of Work Assigned to Students Requiring Computer Usage		
Every week	3	7%
A Few times each semester	8	17%
Sometimes in some semesters	15	37%
Not at all	12	32%
Total	**39**	**93%**

Although only 50% of the faculty are use computers a few times each semester in their teaching (Table VI), more than 60% of faculty members do not give students any assignment or homework that will require the use of computers in **most** of the semesters. Contrast this with the fact that 100% of the faculty use computers almost daily for their personal and professional work (see Table IV). Even for teaching preparation, whatever that means, almost 80% of the faculty use computers a few times each semester. One could not agree more with Blease (1986) in that "such developments must be reflected in our school" (p.3).

8. **Software Familiarity**

Table IX familiarity with frequently used Software						
Software	Level of familiarity					Number of people that need further training in:
	Excellent	Good	Average	Poor	Very Poor	
Word processors (MS word, Tex, Scientific Work place, LaTEX, etc.)	14 (34%)	22 (54%)	4 (10%)	1 (2%)	0 (0%)	15 (37%)
Spreadsheet & Statistical packages (MS Excel, Statistica, SPSS, etc.)	11 (27%)	15 (37%)	9 (22%)	4 (10%)	2 (5%)	12 (29%)

Presentation programs (PowerPoint, etc.)	8 (20%)	13 (32%)	5 (12%)	7 (17%)	8 (20%)	21 (51%)
Internet design programs (FrontPage, etc.)	1 (2%)	10 (24%)	13 (32%)	5 (12%)	12 (29%)	25 (61%)
Computer Algebra System (Mathematica, Maple, Matlab, MathCAD, etc.)	5 (12%)	17 (41%)	9 (22%)	7 (17%)	2 (5%)	22 (54%)
Programing Language (Fortran, C, C++, Java, etc.)	5 (12%)	15 (37%)	8 (20%)	9 (22%)	4 (10%)	15 (37%)

In the area of software familiarity, Table IX indicates that more than 80% of the mathematics faculty is at least good in word-processing, which is the most commonly used software for writing memos, exams, and most journal publications. Similarly, more than 60% indicate that they are at least good at spreadsheet & statistical packages, 50% at computer algebra system, and 40% with programming languages such as Fortran, C, C++, Java, etc. However, only 20% indicated that they are good at Internet design programs (e.g. FrontPage, etc.), while 60% indicated that they are familiar, on average, with presentation programs like PowerPoint.

The results also show that mathematics professors have shown interest in undergoing more training in almost all software areas in order to update their knowledge. Internet design software carried the highest number of volunteers with 60%, followed by computer algebra systems 54%, presentation programs (PowerPoint, etc.) 51%, programming and word processing with 37%, and spreadsheet & statistical packages with 29%.

9. **The effect of Age and Experience on Computer Anxiety**

Many studies have shown the significant effect of age and computer experience on attitudes towards computers (Loyd & Gressard, 1984; Pope-Davis & Twing, 1991). In this study, age and computer experience did not significantly influence attitudes in any of the subscales, perhaps due to the faculty's many years of computer use. However, there is some trend in the raw data that indicates that the younger faculty seem to have high means, indicating a more positive attitude. Similarly, the raw data also indicates some trend in all the subscales showing that the

more the experience the higher the mean, except in computer usefulness subscale. However, the data in the pedagogical usefulness indicates a reverse role: the more the experience, the less the mean, but the younger the years, the more optimistic on the pedagogical usefulness of computers. The results are as follows:

Table XI Means of Computer Anxiety Scores by Age and Computer Experience				
	Computer Experience in years			
Age in Years	3 - 4 Years	4 - 5 Years	More than 5 years	**Total**
23 – 30	1 (38)	1 (32)	3 (37.33)	5 (36.4)
31 - 40	0	0	7 (36)	7 (36)
41 - 50	2 (32)	0	9 (34.8)	11 (34.27)
51 - 55	0	2 (36.5)	14 (36.07)	16 (36.13)
More than 55	0	1 (37)	1 (25)	2 (31)
Total	3 (34.33)	4 (35.5)	34 (35.5)	41 (35.39)

10. **The effect of Age and Experience on Computer Confidence**

Table XII Means of Computer Confidence Scores by Age and Computer Experience				
	Computer Experience in years			
Age in Years	3 - 4 Years	4 - 5 Years	More than 5 years	**Total**
23 - 30	1 (32)	1 (38)	3 (38.67)	5 (37.2)
31 - 40	0	0	7 (36.71)	7 (36.71)
41 - 50	2 (29)	0	9 (35)	11 (33.9)
51 - 55	0	2 (31)	14 (35.14)	16 (34.63)
More than 55	0	1 (30)	1 (32)	2 (31)
Total	3 (30)	4 (33)	34 (35.6)	41 (34.93)

11. **The effect of Age and Experience on Computer Liking**

Table XIII Means of Computer Liking Scores by Age and Computer Experience				
	Computer Experience in years			
Age in Years	3 - 4 Years	4 - 5 Years	More than 5 years	**Total**
23 - 30	1 (24)	1 (32)	3 (33)	5 (31)
31 - 40	0	0	7 (33.86)	7 (33.86)
41 - 50	2 (30)	0	9 (31.89)	11 (31.7)
51 - 55	0	2 (33.5)	14 (31.36)	16 (31.63)
More than 55	0	1 (27)	1 (25)	2 (26)
Total	3 (28)	4 (31.5)	34 (31.97)	41 (31.63)

12. **The effect of Age and Experience on Computer Usefulness**

Table XIV Means of Computer Usefulness Scores by Age and Computer Experience				
	Computer Experience in years			
Age in Years	3 - 4 Years	4 - 5 Years	More than 5 years	**Total**
23 - 30	1 (33)	1 (34)	3 (35.33)	5 (34.60)
31 - 40	0	0	7 (32.71)	7 (32.71)
41 - 50	2 (33.5)	0	9 (33.33)	11(33.36)
51 - 55	0	2 (37)	14 (33.29)	16(33.75)
More than 55	0	1 (29)	1 (32)	2 (30.50)
Total	3 (33.33)	4 (34.25)	34 (33.32)	41(33.41)

13**. The effect of Age and Experience on Pedagogical Usefulness of Computers**

Table XV Means of Pedagogical Usefulness of Computer Scores by Age and Computer Experience				
	Computer Experience in years			
Age in Years	3 - 4 Years	4 - 5 Years	More than 5 years	**Total**
23 - 30	1 (23)	1 (18)	3 (21.67)	5 (21.2)
31 - 40	0	0	7 (21.14)	7 (21.14)
41 - 50	2 (21)	0	9 (18.78)	11 (19.18)
51 - 55	0	2 (21)	14 (17.29)	16 (17.75)
More than 55	0	1 (18)	1 (19)	2 (18.50)
Total	3 (21.67)	4 (19.5)	34 (18.91)	41 (19.17)

4. Conclusion

In this study, there is one very important factor that has not been considered, which is the issue of computer ownership. Computer ownership is one of the variables that many researchers have intensively investigated and found to be a statistically significant factor that influences attitude toward computers (see Nash & Moroz, 1997). However, at King Fahd University of Petroleum & Minerals there is a policy in which all faculty of the University are entitled to a personal computer in their offices that is upgraded or changed after every two years. Similarly, Internet access and e-mail facilities are free. Furthermore, the Information Technology Center (ITC) of the University provides most of the needed software and services free of charge. In view of this,

computer ownership was isolated in this study since all mathematics professors have personal computers in their offices. This information should help in interpreting the level of computer use by the faculty. It is our belief that this policy may have contributed to the positive attitude of the faculty towards computers.

4.1 Summary

1. Mathematics professors at KFUPM have very positive attitudes toward computers and towards the use of computers in their academic activities.
2. Although mathematics professors at KFUPM use computers intensively in many of their academic activities, the rate at which computers are used in the classroom is low compared to the faculty computer usage in research and other purposes. This sharply coincides with Kadijevich's (2002) conclusion that "It seems that, even when computers are available, mathematics teachers rarely use them in their educational practice".
3. The number of years of working experience with computers by the mathematics professors at KFUPM was found to be high.
4. Mathematics professors, despite their differences in age and position do not differ significantly (in statistical sense) in their attitudes, experience, knowledge, and use of computers.
5. Mathematics professors at KFUPM are familiar with most of the software needed in their professional development; however, they seem to be most knowledgeable in the area of word-processing software. The area in which they seem most deficient is in Internet design software. Although this might sound irrelevant to their professional development, 61% registered their willingness to undergo more training in the area. Contrast this with 54% who indicated interest in training in computer algebra system.
6. It appears that the KFUPM policy of "a computer for all faculty" is an excellent initiative that might have some positive impact in computer attitude, usage, and consequently computer experience of the faculty members.

4.2 Recommendations

1. It has been realized that computer attitudes influence not only the acceptance of computers, but also their use as professional tools or as teaching/learning aids. To have computers widely used in mathematics classrooms, we should help teachers develop positive attitudes toward computers (Kadijevich, 2002).
2. Computer ownership is important for the enhancement of faculty access to computers. It is this access that will develop their confidence and make them feel at home with computer and the associated technology.
3. Similarly, free access to the Internet and e-mail should be enhanced. This will increase communication between faculty and their international counterpart, and increase access to many research and pedagogical material that will definitely enhance their teaching and research.
4. Support services should be increased and personalized, to address individual needs in various institutions.
5. Some easy-to-read manuals or instruction sheets should be developed by computer specialist for easy reference.
6. As noted earlier, the result of this study coincides with the Kadijevich's (2002) observation that "even when computers are available, mathematics teachers rarely use them in their educational practice". The reason for this lukewarm attitude according to Kadijevich is "because they do not have (enough) knowledge and skills related to what and how can be achieved by using these tools (Manoucherhri, 1999)". Therefore, to change the present practice, we need to innovate, promptly yet thoughtfully, both pre-service and in-service professional development for mathematics teachers (Kadijevich, 2002).
7. It should be very clear that computer ownership, free access to Internet facilities are not enough to trigger changes in our mathematics classroom practices, in Hiebert's (1999) words "It is difficult to change the way we teach". Therefore, a concerted effort to enlighten and develop the confidence of the mathematics faculty on the use and potential of computers in the mathematics classroom is necessary. This can be achieved by organizing periodic training or workshops for faculty on two fronts: (a) on recent development on various software items especially the ones relevant to their professional development, for instance,

various CAS programs, word processing, spreadsheets, and possibly Internet authoring software, etc. and (b) on instructional technology, whereby the pedagogical usefulness of the various information technologies will be unveiled.

8. Mathematics faculty who are either interested or have experience in the use of technology in teaching should be encouraged. For instance, a research grant could be given to experienced faculty to develop good projects that will guide teachers on the use of technology. However, this must be guided with clarity and vision to avoid falling into the pitfalls of using technology as an end rather than a means to end. For instance, Kadijevich (2002) cited a project that aimed to promote the *NCTM Professional Standards for Teaching Mathematics* (**http://www.nctm.org/standards/**), including but not focusing on technology. The project reported the following benefit to teachers: "consistent opportunities for reflection and sharing; a shortened cycle for training, implementation and evaluation; and teacher empowerment through direct access to information" (Shotsberger, 1999:49).
9. Professional organizations of mathematicians and mathematics teachers (like Saudi Association for Mathematical Sciences (SAMS)), should organize more of these conferences and workshops, and should develop and maintain some appropriate websites focusing on technology-based mathematics education. The content of the site "should, among others, critically inform their visitors of some programs, their usage and suitable classroom activities utilizing them. The usage of each program should be explained in form of a tutorial (see those placed at http://www.bcschools.net/staff/home.html or http://www.fgcu.edu/support/office2000/), which, within a few hours, enables a productive and successful practical work" (Kadijevich, 2002).
10. All these suggestions will increase the experience and develop the confidence of the mathematics faculty on computer usage in education. It is noteworthy that many studies have demonstrated that computer experience has a positive effect on computer attitude, and attitude is the determining factor in successful computer use in our educational practices.

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