

**PSYCHOMETRIC PROPERTIES OF DIFFERENT POSTGRADUATES OF
TEERTHANKER MAHAVEER UNIVERSITY– AN ANALYSIS**

**Dr.Rangoli Srivastava¹, Dr.Pradeep Tangade², Dr.Vikas Singh³, Dr.Surbhi
Priyadarshi⁴, Dr.Meenakshi⁵, Dr.Harshita Pandey⁶**

^{1,6}Post graduate student, Department of Public Health Dentistry, Teerthanker Mahaveer
Dental College & Research Centre, Moradabad,

²Professor & Head, Department of Public Health Dentistry, Teerthanker Mahaveer Dental
College & Research Centre, Moradabad

³Reader, Department of Public Health Dentistry, Teerthanker Mahaveer Dental College &
Research Centre, Moradabad,

⁴Senior Lecturer, Department of Public Health Dentistry, Faculty of Dental Sciences, SGT
University, Gurugram, India

⁵Reader, Department of Public Health Dentistry, Faculty of Dental Sciences, SGT University,
Gurugram, India

ABSTRACT

Introduction – With the upcoming technological advancements it is necessary for every domain to be technologically advanced and to go hand in hand with the upcoming challenges. Medical related domains are the ones who take utmost care of the health of the individual in today's times. **Objectives** –The main rationale of doing this study is to assess the attitudes of the postgraduates towards computer and internet usage. **Materials and methods**-Nearly 1167 postgraduates were taken belonging from 6 different colleges and they were asked to fill a Google doc form and further values were noted regarding their attitude. **Results** – There was no significant association of the gender and the branch to which a postgraduate belonged on the attitude which he/she carried. Age showed a significant correlation with the attitudes. **Conclusion** –Studies like these can help the higher authorities in formulating technology related advancements in the curriculum of the postgraduates and this will help in improving their methodology of practicing in their fields

Keywords – Computer attitude scale, internet attitude scale, medical, para-medical

Abbreviations – CAS-Computer attitude scale, IAS-Internet attitude scale

INTRODUCTION-

Attitude can be designated as one's own outlook be it a positive or a negative perspective regarding any particular topic. We can also say that attitude are over the time learnt and they can also be molded and this change can also be inculcated by the society or the institution to which an individual belong. As per new and updated research an attitude can be summarized as assessment of any opinion and which is explained taking both the external and internal perspectives in various arenas describing it as a good or bad, likeable or not likeable, harmful or beneficial etc. As per Ajzen(1988) attitude is tendency to act either in favor or otherwise to any place, person, object or occasion etc. As already hinted as per this definition attitude already has behavior, emotional related performance as components in it. Attitude towards usage of technology can be defined as an individual's normal assessment or feeling towards

technology and computer use. If we talk about learning attitude it will constitute learning elements. Thus we can say that attitude purposely has got many dimensions. As per theory of planned behavior we can say that as much positive attitude a person carries towards performing, the more effective and positive outcome seem to appear regarding the same.¹

Computer attitude scales and Internet attitude scales are two tools which can help us in assessing one’s particular attitude towards computer and internet utilization. Computer attitude scale consists of 21 statements and there are very basic three subscale division of those statements first one being affective subscale in which particularly what they feel is assessed, secondly perceived usefulness in which their usage parameters are assessed, thirdly perceived control in which their difficulty level is assessed irt technology, fourthly behavioral intention in which their actions are considered. Internet attitude scale is another such tool in which we take the help of 22 statements to assess usage and perspectives that one carry towards internet. It consists of three subscales particularly, firstly perceived usefulness in which the usage of one’s web related characters are assessed, secondly emotional response in which domain of one’s emotions towards/while using internet are assessed and thirdly perceived control in which their difficulty level is assessed irt internet usage.²

Postgraduates have more burden of every aspect as compared to undergraduates in any field. In our study we took all the medical and para medical postgraduates. We wanted to assess how much their curriculum or the treatment domains involves usage of technology particularly.

AIM AND OBJECTIVES –

To assess postgraduates’ attitude towards usage of computers and internet with the help of two tools(CAS, IAS) of medical and para medical branches of Teerthanker Mahaveer University.

MATERIAL AND METHODS –

Before progression of the study all postgraduates were informed regarding the rationale of this research. Postgraduates from 6 different colleges were taken i.e. from dental, medical, para-medical, pharmacy, nursing, physiotherapy. Some demographic details were asked followed by CAS and IAS scale’s statements being asked. All the postgraduates were asked to fill the google doc forms. The respondents were asked to mark their opinion as per likert scale values ranging from 1 to 5 in which 1 depicts strongly disagree and 5 depicts strongly agree opinion.(2= disagree, 3=neutral, 4=strongly agree) For the assessment, main representative was present throughout. The questionnaire was administered via social networking apps. We can describe this study as a quantitative one and it has a multivariate design. SPSS 20.0 version was used for analysis. For assessing reliability of both the scales (CAS & IAS) exploratory and confirmatory analysis of factors were done. Multivariate and univariate analysis was done to assess for effect on various dependent and independent variables. Nearly 1167 postgraduates completed the questionnaires and their inputs were assessed. Out of them nearly 44.3%(n=517) were males and 55.7%(n=650) were females. Postgraduates ranged into a varied age group from 21 to greater than 30 years. Mean age of participants was 25.40, S.D. = 5.22 years. Following table shows distribution of postgraduates by their gender, branch and age. (Table-1)

TABLE 1 – DISTRIBUTION OF POSTGRADUATES AS PER GENDER, AGE, BRANCH		
	NUMBER	PERCENTAGE

PSYCHOMETRIC PROPERTIES OF DIFFERENT POSTGRADUATES OF TEERTHANKER MAHAVEER
UNIVERSITY– AN ANALYSIS

GENDER	MALE	517	44.3
	FEMALE	650	55.7
AGE	<25 YEARS	657	56.2
	25-30 YEARS	349	29.9
	>30 YEARS	161	13.8
BRANCH	DENTAL	122	10.5
	MEDICAL	489	41.9
	NURSING	112	9.6
	PARA-MEDICAL	327	28
	PHARMACY	41	3.5
	PHYSIOTHERAPY	76	6.5

Validation process used for both the scales involved Barlett's test of sphericity and factor analysis. After doing EFA and component analysis four domains were identified in CAS(given by Selwyn,1997) namely affective, perceived usefulness, perceived control, behavior intention. In analysis all components which had load more than 0.4 were kept and rest was not taken. Our 21 scale statements were converted 19 scale statements. Factor loading on affective subscale ranged from 0.52-0.84, on perceived usefulness subscale it was from 0.47-0.63, on perceived control it was 0.49-0.55, on behavioral intention it was 0.42-0.79. The croanbach's alpha coefficient for each subscale was 0.76, 0.77, 0.75,0.76 and on the entire scale it came out be 0.79. After doing EFA and component analysis three domains were identified in IAS(given by Tsai, Lin,2001) namely perceived usefulness, emotional response and perceived control. In analysis all components which had load more than 0.4 were kept and rest was not taken. Our 22 scale statements were converted 21 scale statements. Factor loading on perceived usefulness subscale ranged from 0.62-0.74, on emotional response subscale it was from 0.45-0.68, on perceived control it was 0.45-0.65. The croanbach's alpha coefficient for each subscale was 0.75, 0.76, 0.77 and on the entire scale it came out be 0.8. All subscale showed a significant correlation at p-value<0.05 level hence we can use independent subscale for estimation of computer and internet related attitude.

RESULTS –

Complete assessments of postgraduates' belonging from six different colleges were taken and their perspective towards computer and internet usage was measured in terms of domains or the subscales. Mean value and standard deviation value was taken as landmark values to describe profile of their attitudes. Range of agreement that was calculated came out to 0.99. So a value between 1-1.99 showed low level of agreement, a value between 2-3.99 showed medium level of agreement while 4-5.99, 6-7.99 showed high and very high level of agreement.

PSYCHOMETRIC PROPERTIES OF DIFFERENT POSTGRADUATES OF TEERTHANKER MAHAVEER
UNIVERSITY– AN ANALYSIS

If we assess then we can see that amongst computer usage third subscale i.e. perceived control showed maximum value followed by fourth subscale i.e. behavioral intention followed by perceived usefulness and affective domain. If we assess in the internet usage we can see that emotional response showed highest value followed by perceived control and perceived usefulness. Thus we can say that postgraduates have high level of control when it comes to computer usage and their emotional response is high when it comes to internet usage. (Table-2)

TABLE 2 – SUBSCALES OF CAS AND IAS SCALES AND THEIR DESCRIPTIVE STATISTICS

		CAS SUBSCALES				IAS SUBSCALES		
		Subscale number 1	Subscale number 2	Subscale number 3	Subscale number 4	Subscale number 1	Subscale number 2	Subscale number 3
GENDER	MALE	2.34±5	2.82±2 .21	4.06±1 .99	3.37±1 .37	4.21±4 .18	4.41±2 .33	4.46±5 .14
	FEMALE	2.24±4.68	2.86±2 .23	4.04±1 .97	3.4±1.37	4.11±4 .17	4.38±2 .24	4.34±5 .01
AGE	<25 YEARS	2.84±4.31	2.77±2 .02	4.12±1 .48	3.3±1.55	4.68±3 .02	4.55±2 .27	5.10±4 .42
	25-30 YEARS	1.51±2.333	2.29±2 .39	3.94±2 .43	3.49±0 .92	3.58±3 .49	4.18±1 .87	3.66±1 .25
	>30 YEARS	1.58±2.32	2.99±2 .39	4.01±2 .38	3.52±0 .92	3.68±3 .45	4.24±1 .88	3.57±1 .21
BRANCH	DENTAL	3.61±5.44	3.06±1 .75	4.23±1 .34	3.55±0 .42	4.08±2 .13	4.22±1 .24	3.99±1 .25
	MEDICAL	4.55±2.22	2.89±2 .52	3.89±2 .52	3.53±1 .22	3.49±3 .45	4.22±2 .11	3.55±0 .25
	NURSING	2.22±1.14	3.01±1 .12	3.87±1 .28	3.92±0 .77	4.82±1 .87	4.11±1 .46	4.62±1 .13
	PARA-MEDICAL	3.45±2.49	2.51±0 .64	4.28±0 .55	3.00±0 .29	5.01±1 .01	4.89±0 .51	5.92±0 .74
	PHARMACY	3.45±2.68	3.28±2 .25	3.86±0 .69	3.64±1 .11	4.62±1 .01	4.81±2 .17	4.72±2 .31

PSYCHOMETRIC PROPERTIES OF DIFFERENT POSTGRADUATES OF TEERTHANKER MAHAVEER
UNIVERSITY– AN ANALYSIS

	PHYSIOTHE RAPY	2.51±0. 51	3.02±2 .49	4.11±0 .52	3.21±0 .99	4.56±0 .99	4.13±1 .99	4.63±0 .99
TOTAL		2.26±4. 82	2.84±2 .22	4.05±1 .97	3.38±1 .37	4.21±4 .17	4.44±5 .06	4.42±2 .28

MANOVA analysis was done to study the impact of gender, age and branch particularly on usage level of postgraduates. Wilks lambda statistic was used to assess this. There was no statistically significant effect of all three parameters on the attitude assessed. ($p > 0.05$). The values noted to assess the significance are shown in the following table. (Table-3)

Table 3 – Multivariate significance(MANOVA Analysis) of CAS scale for gender, age, branch					
Effect	Wilks lambda	F	Hypothesis df	Error df	p value
Gender	0.035	333.27	20.0	3788	0.000
Age	0.975	7.446	4.0	1142	0.000
Branch	0.918	12.498	8.0	2284	0.000

To find out which particular variable was affected by participants belonging from different age groups, branches and gender, MANOVA analysis among groups was done. Males and females showed almost same perspectives. All the branches showed nearly similar attitudes but as per age all age groups didn't had similar outlooks in their attitudes. (Table-4)

Table 4 – Multivariate analysis regarding differences among the means of attitude towards usage related to computers in terms of gender, age and branch						
Source	Dependent variable	Type III sum squares	df	Mean square	F-value	p-value
BRANCH	Affective	8633	5	1726	353	0.000
	Perceived usefulness	1134	5	226		0.000
	Perceived control	684	5	136	44.509	0.000
	Behavioral intention	871	5	174	288.4	0.000
GENDER	Affective	1.673	1	1.673	0.342	0.559

PSYCHOMETRIC PROPERTIES OF DIFFERENT POSTGRADUATES OF TEERTHANKER MAHAVEER
UNIVERSITY– AN ANALYSIS

	Perceived usefulness	3.371	1	3.371	0.896	0.334
	Perceived control	1.318	1	1.318	0.428	0.513
	Behavioral intention	1.171	1	1.171	1.937	0.164
AGE	Affective	35.713	2	17.85	3.654	0.026
	Perceived usefulness	8.118	2	4.05	1.079	0.344
	Perceived control	19.782	2	9.89	3.214	0.041
	Behavioral intention	10.904	2	5.45	9.021	0.000

MANOVA analysis was done to study the impact of gender, age and branch particularly on internet usage level of postgraduates. Wilks lambda statistic was used to assess this. There was no statistically significant effect of all three parameters on the internet related attitude assessed. ($p > 0.05$) The values noted to assess the significance are shown in the following table. (Table-5)

Table 5 – Multivariate significance(MANOVA Analysis) of IAS scale for gender, age, branch					
Effect	Wilks lambda	F	Hypothesis df	Error df	p value
Gender	0.027	571.5	15.0	3155	0.000
Age	0.994	2.334	3.0	1143	0.073
Branch	0.960	7.942	6.0	2286	0.000

To find out which particular variable was affected by participants belonging from different age groups, branches and gender, MANOVA analysis among groups was done. Males and females showed almost same perspectives in internet usage. All the branches showed nearly similar attitudes but as per age all age groups didn't had similar outlooks in their attitudes. (Table-6)

Table 6 – Multivariate analysis regarding differences among the means of attitude towards usage related to internet in terms of gender, age and branch					
--	--	--	--	--	--

PSYCHOMETRIC PROPERTIES OF DIFFERENT POSTGRADUATES OF TEERTHANKER MAHAVEER
UNIVERSITY– AN ANALYSIS

Source	Dependent variable	Type III sum squares	df	Mean square	F-value	p-value
BRANCH	Perceived usefulness	3757	5	751	118.778	0.000
	Emotional response	1955	5	391	153.8	0.000
	Perceived control	11828	5	2365	3163.6	0.000
GENDER	Perceived usefulness	0.151	1	0.15	0.025	0.872
	Emotional response	0.483	1	0.483	0.190	0.663
	Perceived control	2.910	1	2.91	3.89	0.049
AGE	Perceived usefulness	58.82	2	29.413	4.64	0.010
	Emotional response	5.45	2	2.72	1.079	0.343
	Perceived control	23.61	2	11.8	15.78	0.000

Also univariate analysis was done to more precisely analyze the effect of age on the postgraduates' attitude towards both the computer and internet usage. As observed in Table-7 different age people differ in their perspectives towards usage ($F=113.32, p<0.05$) in computer usage and ($F=581.723, p<0.05$) in internet usage. (Table-7)

Table 7 – Univariate analysis for differences between means of participants attitude measured through CAS and IAS in terms of age						
Variable	Source	Type III sum squares	df	Mean Square	F	Sig.
Computer	Age group	9349.763	2	4674.881	113.327	0.000
	Error	48016.342	1164	41.251	101.28	0.000
	Total	4171779.000	1167	77.89	55.78	0.000

PSYCHOMETRIC PROPERTIES OF DIFFERENT POSTGRADUATES OF TEERTHANKER MAHAVEER
UNIVERSITY– AN ANALYSIS

	Corrected total	57366.105	1166	86.56	87.33	0.000
Internet	Age group	61793.117	200	30896.558	581.723	0.000
	Error	61825.024	1164	53.114	18.32	0.000
	Total	5106852.000	1167	67.88	3.77	0.000
	Corrected total	123618.141	1166	34.42	1.54	0.000

Post hoc analysis was also done which demonstrated that mean scores obtained were significantly associated with age, students aged 25-30 age group scored more than students aged less than 25 years thus we can say that as the age was increasing the attitudes and perspectives of postgraduates changed as the age was increasing. (Table-8)

Table 8 – Post hoc results for mean difference of participants attitude with respect to age(computer)

Group of age by years	Less than 25	From 25 to 30	More than 30
Less than 25	-	61.84	-
From 25 to 30	55.7994	-	-
More than 30	57.04	-	-

Table 9 – Post hoc results for mean difference of participants attitude with respect to age(internet)

Less than 25	-	71.754	-
From 25 to 30	56.8854	-	-
More than 30	57.5342	-	-

DISCUSSION –

Postgraduate students depicted a positive attitude towards computer and internet usage. We can give the credibility of having such a positive attitude in both the parameters to technologically fulfilled infrastructure in TMU. Also now days computers are an integral part right from school life of an individual. Hence there’s no wonder how and why computers and technology are taking a lead role even in undergraduates and postgraduate’s life too.

Also there were no differences which were gender based among attitude, these findings are consistent with the findings of study done by Teo , 2008. Also as per a study conducted by North and Noyes, 2007 it was felt that this particular domain has helped in clearing the gender differences that were present. There were some studies done by many other authors like Adebowale et al, 2010, Shashani ,1993 which showed proper gender predilection in usage levels in the study. All postgraduates belonged from the same university. They seem to had knowledge in usage parameters, also all facilities were equally distributed among both males and females hence no predilection was seen.

In terms of branches also there was no significant difference among different branches taken. This is quite normal as all those who have participated are postgraduates and their searches would have been a part of almost everyone’s curriculum/educational purpose.

In terms of age there was a significant difference which showed age is somehow a factor which increased the usage value of both computers and internet among all the postgraduates. This finding was not in line with the study done by Teo, 2008 in which there was no effect of age on computer and internet related attitude of those participants.

CONCLUSION –

Benefit of this research is that we can compare and assess different branches altogether belonging from different age groups. Findings obtained from this research can be beneficial for the University of the Higher Authorities. Also this research demonstrates two different scale in an environment in which variety of postgraduates was present. Variables analyzed were gender, branch and age group of that particular postgraduate.

This research gives an insight into particular variables which impacts computer and internet usage. Thus this research can help the authorities to particularly focus on that domain which is having comparatively less usage attitudes. Also this study might help in technology adoption by particular branches and lead to promotion of e-learning in the university. All postgraduates might somewhere join academics hence it is very necessary for them to promote these usage attitudes so that they can also further guide the upcoming postgraduates/undergraduates to have an upper hand linked to computer and internet usage.

As the future health of all individuals is in the hands of these postgraduates, this study thus will help us in giving a proper insight as to how much use and what are the significant attitudes they carry towards technology as with the upcoming modern generation they also need to go hand in hand with the technology so that there is a mutual benefit for both the needy and the provider.

LIMITATIONS –

This study also has some limitations as it might involve information bias present as all the postgraduates have a busy schedule involving many tasks and thus in a hurry to fill the form they might not have given as much time in filling the same with proper markings. As it was conducted in a technologically fulfilled university, therefore the attitudes might come out to be positive while if the same study will be conducted in another university with not as many facilities then there might be a probability that the attitudes might come out to be different.

REFERENCES-

[1] Adebowale, O. F., Adewale, I. A., & Oyeniram, F. M. (2010). Computer interest, approval and confidence of secondary school students in three selected local governments of Lagos State (Nigeria): Implications for global computerization. *International Journal of Education and*

- Development using Information & Communication Technology (IJEDICT), 6(1).
- [2] Ajzen, I. & Fishbein, M. (1980). Understanding attitudes and predicting social behavior. Englewood Cliff, NJ: Prentice Hall.
- [3] Ajzen, I. (1988). Attitudes, personality, and behavior. Bristol, UK: Open University Press
- [4] Akbaba, S., & Kurubacak, G. (1999). Teachers' attitudes towards technology. *Computers in the Social Studies*, 7(2), 833–836
- [5] Albion, P. R. (2003). PBL + IMM = PBL2: Problem-based learning and interactive multimedia development. *Journal of Technology and Teacher Education*, Vol. 11(2), 243-257
- [6] Al-Jabri, I. M. (1996). Gender differences in computer attitudes among secondary school students in Saudi Arabia. *Journal of Computer Information Systems*, 37, 70-75.
- [7] Arbuckle, J.L. 2006, AMOS (version 7.0), [Computer software], SmallWaters, Chicago.
- Avraham, L. (2005). Differences in the way males and females perceive computers, retrieved from <http://eserver.org/course/spring97/76100o/contributions/avraham/>
- [8] Azjen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.), *Action control: From cognition to behavior* (pp. 11–39). New York: Springer Verlag. Bandalos,
- [9] D. & Benson, J. (1990). Testing the factor structure invariance of a computer attitude scale over two grouping conditions. *Educational and Psychological Measurement*, 50(1), 49-60.
- [10] Bentler, P. M. (1990). Comparative fit indices in structural models. *Psychological Bulletin*, 107, 238–246.
- [11] Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588–606.
- [12] Binder, M., & Niederle, U. (2007). Institutions as determinants of preference change- A one way relation? Retrieved from <https://papers.econ.mpg.de/evo/discussionpapers/2006-07.pdf>
- [13] Birisci, S., Metin, M., & Karakas, M. (2009). Prospective elementary teachers' attitudes toward computer and Internet use: A sample from Turkey. *World Applied Science Journal*, 6(10), pp. 1433-1440.
- [14] Blackmore, M., Stanley, N., Coles, D., Hodgkinson, K., Taylor, C., & Vaughan, G. (1992). A preliminary view of students' information technology experience across UK initial teacher training institutions. *Journal of Information Technology in Teacher Education*, 1(2), 241–254.
- [15] Brennan, R., McFadden, M., & Law, E. (2001). Review of research. All that glitters is not gold: Online delivery of education and training. Leabrook: National Centre for Vocational Education Research.
- [16] Brosnan, M., & Lee, W. (1998) A cross-cultural comparison of sex differences in computer attitudes and anxieties: The United Kingdom and Hong Kong. *Computers in Human Behavior*, 14(4), 559-577.
- [17] Brown, F. (1983). Principles of educational and psychological testing 3rd ed. New York, NY: Holt, Rinehart & Winston. Bryman, A., & Cramer, D. (1997). Quantitative data analysis with SPSS for Windows: A guide for social scientists. London, UK: Routledge.
- [18] Bullock, D. (2004). Moving from theory to practice: an examination of the factors that preservice teachers encounter as they attempt to gain experience teaching with technology during field placement experiences. *Journal of Technology and Teacher Education*, 12(2), 211-

237.

- [19] Cavas, B., Cavas, P., Karaoglan, B. & Kislak, T. (2010). A study on science teachers' attitude toward information and communication technologies in education. *The Turkish Online Journal of Educational Technology*, 8(2), 20-32.
- [20] Chai, C. S., Hong, H. Y., & Teo, T. (2009). Singaporean and Taiwanese pre-service teachers' beliefs and their attitude towards ICT: A comparative study. *The Asia-Pacific Education Researcher*, 18(1), 117–128.
- [21] Clark, K. D. (2001). Urban middle school teachers' use of instructional technology. *Journal of Research on Computing in Education*, 33(2), 178–195.
- [22] Czaja, S., Charness, N., Fisk, A., Hertzog, C., Nair, S., Rogers, W. (2006). Factors predicting the use of technology: Findings from the Center for Research and Education on Aging and Technology Enhancement. *Psychology and Aging*, 21(2), 333-352.
- [23] Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technologies, *MIS Quarterly*, 13(3), 319–340.
- [24] Delcourt, M. A. B., & Kinzie, M. B. (1993). Computer technologies in teacher education: The measurement of attitudes and self-efficacy. *Journal of Research and Development in Education*, 27(1), 35-41.
- [25] Duggan, A., B. Hess, D. Morgan, S. Kim, & Wilson, K. (2001). Measuring students' attitudes toward educational use of the Internet. *Journal of Educational Computing Research*, 25(3), 267-281.
- [26] Dyck, J. L., & Smither, J. A. A. (1994). Age differences in computer anxiety: The role of computer experience, gender and education. *Journal of Educational Computing Research*, 10(3), 239-248.
- [27] Field, P. (2000). *Discovering statistics using SPSS for Windows: Advanced techniques for the beginner*. London, UK: Sage.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley. Retrieved 9 June, 2011 from <http://people.umass.edu/ajzen/f&a1975.html>
- [28] Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York: Psychology Press (Taylor & Francis).
- [29] Fisher, M. (2000). Computer skills of initial teacher education students. *Journal of Information Technology for Teacher Education*, 9(1), 109–123.
- [30] Foong-Mae, C. (October, 2002). *ICT in Malaysian schools policy: Policy and Strategies*. Seminar/Workshop on the Promotion of ICT Education to Narrow the Digital Divide, Tokyo, Japan. Retrieved from <http://unpan1.un.org/intradoc/groups/public/documents/gaid/unpan033365.pdf>.
- [31] Francis, L., Katz, Y., & Jones, S. (2000). The reliability and validity of the Hebrew version of the Computer Attitude Scale. *Computers & Education*, 35(2), 149-59.
- [32] Garland, K. J., & Noyes, J. M. (2005) Attitudes and confidence towards computers and books as learning tools: A cross-sectional study of student cohorts. *British Journal of Educational Technology*, 36, 85-91.
- [33] Graff, M. (2003). Cognitive style and attitudes towards using online learning and assessment methods. *Electronic Journal of e-Learning Methods*, 1(1), 21-28.
- [34] Harrison, J., Seeman, J., & Behm, R. (1991). Development of a distance education

- assessment instrument. *Educational Technology Research and Development*, 39(4), 65-77.
- [35] Huang, H. M., & Liaw, S. S. (2005). Exploring user's attitudes and intentions toward the web as a survey tool. *Computers in Human Behavior*, 21(5), 729-743.
- [36] Isman, A., & Dabaj, F. (2004). Attitudes of students towards Internet. *Turkish Online Journal of Distance Education - TOJDE*, 5(4). Retrieved from <http://tojde.anadolu.edu.tr/tojde16/articles/dabaj.htm>
- [37] Kersaint, G., Horton, B., Stohl, H., & Garofalo, J. (2003). Technology beliefs and practices of mathematics education. *Journal of Technology and Teacher Education*, 11(4), 549-577.
- [38] Khine, M. S. (2001). Attitudes toward computer among teacher education students in Brunei Darussalam. *International Media*, 28(2), 147-153.