Table 7: T-test results obtained from subdimensions of the scales WACL, SCC, and PL for paired samples

Scale	Subdimensions	Test	N	X	S	Sd	t	ρ
WACL	INT-CLA	Pre-test	58	21.25	1.95	57	-4.923	0.000***
		Post-test	58	23.68	3.04			
	INT-USE	Pre-test	58	31.96	4.12		-3.627	0.001**
		Post-test	58	34.74	4.44			
	ITM	Pre-test	58	19.48	1.78		-10.174	0.000***
		Post-test	58	24.17	3.06			
	COL	Pre-test	58	48.39	3.98		-14.383	0.000***
		Post-test	58	60.62	5.59			
SCC	LOY	Pre-test	58	21.89	2.38	57	-2.811	0.007**
		Post-test	58	23.0	2.16			
	LER	Pre-test	58	20.94	1.80		13.705	0.000***
		Post-test	58	16.72	2.24			
PL	COG	Pre-test	58	15.46	2.80	57	4.698	0.000***
		Post-test	58	13.48	1.80			
	AF	Pre-test	58	15.24	3.13		-1.513	0.136
		Post-test	58	16.10	2.88			
	PSY	Pre-test	58	16.13	2.67		5.063	0.000***
		Post-test	58	13.79	1.91			

***ρ<0.001, **ρ<0.01, *ρ<0.05, WACL: Web-assisted COL, SCC: Sense of community of classroom, PL: Perceived learning, INT-CLA: Internet and classroom together, INT-USE: Using the internet, ITM: Instructional technologies and material design, COL: Collaborative learning, LOY: Loyalty, COG: Cognitive, AF: Affective, PSY: Psychomotor

Table 8: T-test results obtained from subdimensions of the scales WACL, SCC, and PL for independent samples when gender is considered

Scale	Sub-dimensions	Test	Gender	N	M	S	Sd	t	ρ
PL	AF	Pre-test	Female	45	14.75	3.07	56	−2.274	0.027*
			Male	13	16.92	2.84			

***ρ<0.001, **ρ<0.01, *ρ<0.05, AF: Affective, PL: Perceived learning, WACL: Web-assisted COL, SCC: Sense of community of classroom

an important effect in increasing the views of participants in relation to WACL, SCC, and PL.

In Table 7, the pre- and post-test results obtained from the responses of the pre-service teachers to the sub-dimensions of the tools WCAL, SCC, and PL clearly show that there were significant differences between pre-test and post-test findings (INT-CLA: $t(57) = -4.923$, $\rho < 0.001$; INT-USE: $t(57) = 3.627$, $\rho < 0.01$; ITM: $t(57) = -10.174$, $\rho < 0.001$; COL: $t(57) = -10.174$, $\rho < 0.001$; LOY: $t(57) = -2.811$, $\rho < 0.01$; LER: $t(57) = 13.705$, $\rho < 0.001$; AF: $t(57) = 4.698$, $\rho < 0.001$; and PSY: $t(57) = 5.063$, $\rho < 0.001$) with the exception of the AF subdimension ($t(57) = -1.513$, $\rho > 0.05$). Among the pre-test average of the scales' subdimensions, INT-CLA changed from M = 21.25 in the pre-test to M = 23.68 for the post-test. Similarly, for INT-USE the change was from M = 31.96 to M = 34.74; for ITM it raised from M = 19.48 to M = 24.17, and for LOY the increase was from M = 21.89 to M = 23.0. The highest change was seen on the COL subdimension; it changed from M = 48.39 to M = 60.62. Besides this, COG, LER, and PSY subdimensions average scores dropped from M = 15.4655, M = 20.94, and M = 6.13 to M = 13.48, M = 16.72, and M = 13.79, respectively. Although this may look interesting, it is thought that the drop in average scores is due to reverse items of scales.

In Table 8, it is clearly seen that considering pre- and post-test results; there is a significant difference between male and female responses for the subdimension AF through the views of pre-service teachers on pre-test results ($t(56) = -2.274$, $\rho < 0.05$). According to the findings it is possible to say that male scores (M=16.92) were higher than female scores (M=14.75) for the AF sub-dimension.

Table 9 presents a significant difference between participants having and not having prior experiences of WACLA when the subdimension AF was considered ($t(56) = 2.028$, $\rho < 0.05$). According to the findings, the participants having prior experiences of WACLA scored higher (M = 17.42) than those who lacked such experiences (M = 15.19).

According to Table 10, the pre-test results obtained for the tools WACL, SCC, and PL clearly showed that there were significant differences between having prior experience of WAC and lack of it when AF and INT-USE were considered (AF: $t(56) = -2.261$, $\rho < 0.05$ and INT-USE: $t(56) = -2.992$, $\rho < 0.01$). For AF and INT-USE, the comparative scores of having and not having prior experience of WAC were higher (M = 15.07) and (M = 20.00) than the others (M=31.67) and (M=40.00) indicating higher scores for those with prior experience of WAC for subdimensions.

Table 9: T-test results obtained from subdimensions of the scales WACL, SCC, and PL for independent samples when prior experiences of WACLA considered

Scale	Subdimensions	Test	WACLA	N	M	S	Sd	t	ρ
PL	AF	Pre-test	Yes	7	17.42	2.50	56	2.028	0.047*
			No	51	15.19	2.75			

***ρ<0.001, **ρ<0.01, *ρ<0.05, AF: Affective, PL: Perceived learning, WACL: Web-assisted COL, SCC: Sense of community of classroom

Table 10: T-test results obtained from subdimensions of the scales WACL, SCC, and PL for independent samples when prior experiences of WAC considered

Scale	Sub-dimensions	Test	WAC	N	M	S	Sd	t	ρ
PL	AF	Pre-test	Yes	56	15.07	3.05	56	−2.261	0.028*
			No	2	20.00	1.41			
WACL	INT-USE	Pre-test	Yes	56	31.67	3.89	56	-2.992	0.004**
			No	2	40.00	0.00			

***ρ<0.001, **ρ<0.01, *ρ<0.05, AF: Affective, PL: Perceived learning, WACL: Web-assisted COL, SCC: Sense of community of classroom, WAC: Web-assisted course, INT-USE: Using the internet

DISCUSSION AND CONCLUSION

To enhance the traditional educational methods in higher education, web-assisted technologies can provide alternative ways and professional developments on innovative pedagogical strategies such as COL environments. This study explored pre-service teachers' views toward PL and community of the classroom through using web-assisted technologies and discussed the findings. The study highlighted the effect of web-assisted COL environments on the SCC and PL. Experiments were set up conducting pre-tests and post-tests on pre-service teachers introduced to the use of the technologies in question. A social learning network, Edmodo was used as a platform in this context. The sample was chosen from a population of pre-service teachers from Sakarya University who were expected to be introduced to web-assisted technologies and work on technological projects as part of their studies. Results were then analyzed to show the effectiveness of the experimental process on the SCC, and PL. Huang et al. (2010) studied similar concepts using social networking sites as a supplementary tool instead, reporting positive feedback from the majority of participants. The findings of our study correlate with this. Pre-test and post-test results clearly showed that the participants' views on WACL, SCC, and PL significantly changed following the experiment.

The results obtained from pre- and post-tests showed the effectiveness of the experimental process on changing participants' views on WACL and PL. In comparison to the relevant literature, the findings are consistent with the studies which show the effectiveness of web-based technologies in collaborative environments (McDonald, 2002; Rafaeli et al., 2004). It is believed that web-based technologies support sharing knowledge and can enhance better teaching and learning. Moreover, various opportunities are offered by the systems for both instructors and learners such as assessing peers' work and exchanging information in their studies.

In addition, pre- and post-test results for the subdimensions of the instruments such as INT-CLA, INT-USE, ITM, and COL of WACL; AF, COG, and PSY of PL; and LOY and LER of SCC were analyzed. The findings showed that the subdimensions of instruments were significantly different ($\rho < 0.001$; $\rho < 0.01$) with the exception of AF of PL. Actually this finding can stem from attitudes of students toward the computer, internet and other technologies relevant to AF learning. This outcome supports findings previously published (Triandis, 1971), where it is suggested that attitudes consist of AF, cognitive, and behavioral components. Moreover, Liaw (2002) indicated in his studies that computer-related experiences bring a more positive perception to computer and web technologies. According to Thompson et al. (1991) anxiety, confidence, and liking represent the AF part of the attitude. It is possible to suggest through the participants' views that the subjects of the study are digital natives born into technology and have confidence in using technology due to having more experience with computer and web technologies. The insignificant findings of pre- and post-test results on AF may be due to the familiarity of these technologies to the participants.

Demographic characteristics of the subjects such as gender, having/or not having prior experiences on WACA, and having/or not having prior experiences on WAC were analyzed through the subdimensions of the instruments used. The findings showed that gender made a significant difference in AF. Furthermore, it was seen that males' AF learning scores were higher than those of their female counterparts. These findings are in conformance with the studies of Liaw (2002), Chen (1986), Fetler (1985), and Temple and Lips (1989) indicating that males have a more positive perception, as well as the study of Meier and Lambert (1991) showing less anxiety for males. Furthermore, Durndell and Thomson (1997), Durndell and Hagg (2002), and Whitely (1997) showed that males were more experienced in using computers than females. Finally, Tsai (2008) revealed that males tend to prefer internet-based environments more than females do which was confirmed by the findings of this study. Various studies reported the effect of teacher immediacy on AF learning (Gorham, 1988; Kearney

Tsai, C.C. (2008). The preferences toward constructivist internet-based learning environments among university students in Taiwan. *Computers in Human Behavior,* 24(1), 16-31.

Volet, S., Summers, M., & Thurman, J. (2009). High-level co-regulation in collaborative learning: How does it emerge and how is it sustained? *Learning and Instruction,* 19(2), 128-143.

Ward, M., & Newlands, D. (1998). Use of the web in undergraduate teaching. *Computers and Education,* 31(2), 171-184.

Warschauer, M. (2004). The rhetoric and reality of aid: Promoting educational technology in Egypt. *Globalisation, Societies and Education,* 2(3). Available from: http://www.gse.uci.edu/faculty/markw/rhetoric.pdf. [Last retrieved on 2016 Sep 28].

Weber, A. (2012). Considerations for social network site (sns) use in education. *International Journal of Digital Information and Wireless Communications,* 2(4), 37-52.

Wegerif, R. (1998). The social dimension of asynchronous learning networks. *Journal of Asynchronous Learning Networks,* 2(1), 34-49.

Whitely, B.E.J. (1997). Gender differences in computer related attitudes and behavior: A meta analysis. *Computers in Human Behavior,* 13(1), 1-22.

Wu, Y.T., & Tsai, C.C. (2006). University students' internet attitudes and internet self efficacy: A study at three universities in Taiwan. *Cyber Psychology and Behavior,* 9, 441-450.

Yaghi, H.M., & Abu-Saba, M. (1998). Teacher's computer anxiety: An international perspective. *Computers in Human Behavior,* 14(2), 331-336.

Yang, F.Y., & Tsai, C.C. (2008). Investigating university student preferences and beliefs about learning in the web-based context. *Computers and Education,* 50, 1284-1303.

Zhu, E., & Baylen, D.M. (2005). From learning community to community learning: Pedagogy, technology and interactivity. *Educational Media International,* 42(3), 251-268.