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Contact Address:
Prof. Dr. Aytekin İŞMAN
TOJET, Editor in Chief
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Message from the Editor-in-Chief

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TOJET welcomes you. TOJET would like to thank you for your online journal interest. The online journal system has been diffused very fast for last eighteen years. We are delighted that more than 600,000 educators, teachers, parents, and students from around the world have visited for the eighteen years. It means that TOJET has continued to diffuse new trends in educational technology to all over the world since October, 2002. We hope that the volume 19, issue 1 will also successfully accomplish our global educational technology goal.

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TOJET thanks and appreciate the editorial board who have acted as reviewers for one or more submissions of this issue for their valuable contributions.

TOJET, AECT-Association for Educational Communication and Technology, Sakarya University, İstanbul University - Cerrahpaşa and Governor State University will organize IETC-2020 Eighteenth International Educational Technology Conference (www.iet-c.net) September 2 - 3, 2020 at Cyprus International University. This conference is now a well-known educational technology event. It promotes the development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities. Its focus is to create and disseminate knowledge about the use of instructional technology for learning and teaching in education. IETC-2019 conference book has been published at **http://www.iet-c.net/pubs**

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January 01, 2020
Prof. Dr. Aytekin ISMAN
Sakarya University

Editorial Board

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Examining Media Literacy Levels and Personality Traits of Physical Education and Sports Students According to Certain Demographic Variables

Metin YAMAN
Gazi University
metinyaman@gazi.edu.tr

ABSTRACT
The present study aims to examine the media literacy and personality traits of physical education and sports students according to certain demographic variables. 197 volunteering students of 80 females and 117 males who studied at Sakarya University Faculty of Sports Sciences and Bartın University Physical Education and Sports College in 2016-2017 academic years participated in the study. In order to define the students' personality traits "Ten-item Personality Scale" (TPS) was used. In order to define media literacy, "Media Literacy Level Identification Scale" was used. Statistical analysis of the data was carried out through Kruskal Wallis H Test, Mann Whitney U Test and Spearman Correlation Test in the SPSS 22.0 program. The analyses showed a significance level of $p<0,05$. The results of the study showed that media literacy levels of the students was average and media literacy levels did not differ significantly according to their gender and age group variables ($p>0.05$). When the students' personality traits were examined, personality trait of openness to experiences was average and the other personality traits were above average. When gender variable was taken into consideration, male students had significantly more openness to experience in their personality traits than female students ($p<0.05$); while according to the age group variable, 20 year-old students had more responsible personality than 19 year-old students ($p<0.05$). Additionally, there was a positively significant relationship between the students' personality traits and their media literacy ($p<0.05$). As a result, gender and age variables were not important determiners; whereas age and gender variables influenced the personality traits. The findings revealed that university students' age and gender influenced their personality traits; while they did not influence the students' media literacy. Additionally, there was a statistically significant relationship between the students' personality traits and their media literacy. For future studies, suggestions could include a number of different variables that influence personality traits and media literacy of university students such as various age groups, school types, locations and parent attitudes; comparing electronics they have, digital media tools, etc to demographic variables.

Keywords: Physical Education and Sports, university students, personality traits, media literacy.

INTRODUCTION
Today, the information accessed by people does not only inform them; but also influence their standard of judgement, beliefs and attitudes in different perspectives and even reshape people's thoughts on many areas. In such an atmosphere, notions of media and literacy are integrated (Önal, 2007: 337). Media literacy is defined as the ability to access written and visual messages which have great variety (TV; cinema, video, the Internet, advertisements, etc.) and evaluate, analyze and transfer those messages (Solmaz and Yılmaz, 2012: 55). Another definition reads, media literacy "are the knowledge and skills that are needed in order to analyze, inquire, interpret and evaluate media messages" (Deveci and Cengelci, 2008: 26). Media literacy allows individuals to read media more consciously, express themselves more easily and be more active in social life (Solmaz and Yılmaz; 2012: 55). Additionally, media literacy helps people to create their own media messages (Kartal and Kıncal, 2012: 169).

First thing that makes media literacy is the fact that the messages create control over individuals in the target audience. Therefore, the more the children and individuals from every part of community is well-informed on the subject of media literacy the better they can distinguish the line between real media and real world. Furthermore, individuals with high media literacy can protect themselves from harms of the media (Solmaz and Yılmaz; 2012: 55). In fact, one of the factors that caused media literacy to emerge is the aim to protect oneself from the harms of the media (Gündüz-Kalan, 2010: 59). This situation has revealed the necessity to raise knowledgeable and conscious media literates on the effects of media on societies through various tools or ways (Kurt and Kürüm, 2010: 20; Korkmaz and Yeşil, 2011: 110). In accordance with this necessity, media literacy has entered the curriculum today (Solmaz and Yılmaz, 2012: 55).

Humans' defining and distinguishing patterns of emotion, thought and behaviors which define their individual and social way of interaction is described as "personality" (İnci, 2011: 267). Another definition says personality is "the person's autogenous, consistent patterns of behavior" (Burger, 2006: 23). As personality is shaped according to hereditary and environmental factors, individuals' personality traits may change over time. In this context, personality is assessed as a phenomenon which distinguishes people from others, idiosyncratic and different in each individual. People's personalities do not differ all the time according their environment. An individual who has a calm personality in daily life is also maintains her/his calm personality at school or something they come across (Aytaç, 2001: 1).

It is known that university students spend a lot of their time on mass media tools and results of the studies in the literature also support this view (Karaman, 2010: 60). This situation reveals that university students' media literacy is a subject which needs attention. On the other hand, studies and publishing done on media literacy in Turkey are quite limited (Ünlü, 2017: 67). People generally use media tools according to their personality traits and what they follow is shaped according to their personality (Kim et al., 2013: 498). Studies in the literature support the view that personality traits and media literacy have a significant relationship (Karabay, 2015: 1173; Austin et al., 2016: 600). However, related studies were scarce in Turkey. At this point, the question of "Is there a relationship between university students' personality traits and their media literacy?" had to be answered. In this context, this study aimed to examine the sports sciences students' media literacy levels and their personality traits according to certain demographic variables.

While the relationship between the students' personality traits and their media literacy were examined, their personality traits and media literacy levels were also examined according to gender and age variables, because studies in the literature claimed that there was a significant relationship between gender and age group and personality traits Chapman et al., 2007: 1594; Costa et al., 2001: 322; Paris, 2004: 71; McCrae et al., 2004: 144; Soto et al., 2011: 330). In addition, they discovered significant relationship between age and gender and media literacy (Skaar, 2009: 39). However, the scarcity of data on university students in the literature led the researcher to study with university students. The study included 197 volunteering (80 female, 117 male) at Sakarya University, Faculty of Sports Sciences and Bartın University Sports College in 2017-2018 academic year.

MATERIALS AND METHOD

Research Model

Survey model from narrative research techniques which is quite frequently used in the field of sports sciences was used in this study. As is known, studies which are carried out with survey model are known as narrative research method used to define the focus group's features (age, marital status, gender, etc.) (Can, 2014: 8).

Study Group

197 volunteering students of 80 females and 117 males who studied at Sakarya University Faculty of Sports Sciences and Bartın University Physical Education and Sports College in 2016-2017 academic years were involved in this study. Demographic features of the students in the study group are presented in Table 1.

Table 1. Distribution of frequency and percentage regarding the participants' demographic information

Variables	Sub-variables	F	%
Age groups	18	46	23,4
	19	76	38,6
	20	43	21,8
	20+	32	16,2
Gender	Female	80	40,6
	Male	117	59,4

The table shows that 23,4% of the participants are in the age group of 18; 38,6% of them in the age groups of 19; 21,8% of them in the age group of 20; and 16,2% of them in the age group of 20+.

Data Collection Tools

To define the participants' personality traits, "Ten-item Personality Scale (TPS)" was used. TPS was developed by Gosling et al. (2003: 504); and adapted into Turkish by Atak (2013: 312). The scale which was developed according to the five-factor personality traits measures the five important personality traits of openness to experience, Conscientiousness, extroversion, Agreeableness and emotional stability. The scale included 7-Likert type items with two items for each personality trait. In the process of adapting the scale into Turkish, the

Cronbach-Alpha index was 0.89 in the sub-dimension of openness to experience; 0.87 in Conscientiousness; and 0.88 in extroversion (Atak, 2013: 312).

In order to determine the participants' media literacy, "Media Literacy Level Identification Scale" developed by Karaman and Karataş (2009: 802) was used. The development of the scale was applied on the prospective teachers and it was comprised of three sub-dimensions and 17 items. The sub-dimensions of the scale were being informed, ability to analyze and react, ability to judge and recognize organized messages. The scale was a 5-point Likert type and the answers included never (1), rarely (2), sometimes (3), usually (4) and always (5). Cronbach-Alpha indexes were .721 on being informed; .705 on ability to analyze and react; and .680 on ability to judge and recognize organized messages.

Statistical Analyses

SPSS 22.0 program was used to analyze the data that were gathered. Neither of the sub-dimensions of the scales showed normal distribution; therefore non-parametric analysis methods were used. In order to compare and contrast between the scale scores of the participants according to their age group, Kruskal Wallis H Test was run; while Mann Whitney Test was run in order to compare and contrast between them according to their gender. In order to examine the relationship between the scores of both scales, Spearman Correlation analysis was carried out. The analyses showed p<0,05 level of significance.

FINDINGS

Table 2. Defining Statistics regarding the Participants' Media Literacy and Personality Traits

Scales	Sub-dimensions	X	Sd
Media Literacy	Being informed	4,05	,742
	Ability to analyze and react	3,64	,744
	Ability to judge and recognize organized messages	3,79	,813
	Media literacy total	3,85	,690
Personality	Extroversion	4,42	1,133
	Emotional Stability	4,41	1,396
	Openness to Experience	3,89	1,299
	Conscientiousness	4,22	1,192
	Agreeableness	4,58	1,235

The table shows that the participants' levels of being informed, ability to analyze and react, and ability to judge and recognize organized messages are average. The participants' personality trait of openness to experience was average while the other personality traits were above average.

Table 3. Comparison of the participants' media literacy levels according to their gender

Sub-dimensions	Gender	n	X	Sd	Mean	Total	U	p
Being informed	Female	80	4,13	,626	102,56	8205,0	4395,0	,467
	Male	117	4,00	,810	96,56	11298,0		
Ability to analyze and react	Female	80	3,71	,718	103,39	8271,0	4329,0	,370
	Male	117	3,59	,761	96,00	11232,0		
Ability to judge and recognize organized messages	Female	80	3,81	,728	98,38	7870,0	4630,0	,898
	Male	117	3,78	,869	99,43	11633,0		
Media literacy total score	Female	80	3,91	,602	101,22	8097,5	4502,5	,651
	Male	117	3,80	,745	97,48	11405,5		

The table reveals that being informed, ability to analyze and react, ability to judge and recognize organized messages do not display statistically significant difference (p>0,05).

Table 4. Comparison of the participants' media literacy levels according to their age group

Sub-dimensions	Age groups	n	X	Sd	Mean	x^2	p
Being informed	18	46	4,23	,591	110,37	2,586	,460
	19	76	4,03	,714	96,33		
	20	43	3,94	,853	92,50		

Ability to analyze and react	20+	32	4,00	,830	97,73	,367	,947
	18	46	3,67	,541	98,09		
	19	76	3,68	,783	100,52		
	20	43	3,58	,819	95,03		
	20+	32	3,59	,820	102,03		
Ability to judge and recognize organized messages	18	46	3,89	,779	106,29	1,159	,763
	19	76	3,78	,742	95,54		
	20	43	3,76	,872	96,34		
	20+	32	3,75	,957	100,31		
Media literacy total socre	18	46	3,95	,536	105,33	,953	,813
	19	76	3,84	,658	96,47		
	20	43	3,77	,801	95,17		
	20+	32	3,79	,806	101,06		

The table shows that being informed, ability to analyze and react, ability to judge and recognize organized messages and total media literacy levels do not statistically and significantly differ according to the age groups (p>0,05).

Table 5. Comparison of the participants' personality traits according to their gender

Sub-dimensions	Gender	n	X	Sd	Mean	Total	U	p
Extroversion	Female	80	4,40	1,080	95,83	7666,5	4426,5	,510
	Male	117	4,44	1,172	101,17	11836,5		
Emotional Stability	Female	80	4,33	1,499	97,68	7814,0	4574,0	,786
	Male	117	4,46	1,325	99,91	11689,0		
Openness to experiences	Female	80	3,64	1,343	88,79	7103,0	3863,0	,036
	Male	117	4,07	1,244	105,98	12400,0		
Conscientiousness	Female	80	4,09	1,147	92,57	7405,5	4165,5	,186
	Male	117	4,30	1,219	103,40	12097,5		
Agreeableness	Female	80	4,64	1,086	100,54	8043,0	4557,0	,752
	Male	117	4,54	1,330	97,95	11460,0		

The table shows that personality traits of extroversion, emotional stability, Conscientiousness and Agreeableness do not display statistically significant difference according to gender; whereas personality trait of openness to experiences was significantly more present in male participants (p<0,05).

Table 6. Comparison of the participants' personality traits according to their age group

Sub-dimensions	Age groups	n	X	Sd	Mean	x^2	p
Extroversion	18	46	4,62	1,252	108,22	1,875	,599
	19	76	4,31	1,163	95,00		
	20	43	4,45	,800	99,70		
	20+	32	4,36	1,265	94,31		
Emotional stability	18	46	4,58	1,374	105,29	3,830	,280
	19	76	4,18	1,348	89,13		
	20	43	4,53	1,369	106,45		
	20+	32	4,53	1,560	103,39		
Openness to experiences	18	46	3,95	1,262	101,61	,573	,903
	19	76	3,84	1,320	97,32		
	20	43	3,84	1,266	95,50		
	20+	32	4,03	1,391	103,94		
Conscientiousness	18	46	4,17	1,326	98,13	9,091	,028
	19	76	3,99	1,149	87,36		
	20	43	4,62	1,169	119,79		
	20+	32	4,28	1,016	99,95		
Agreeableness	18	46	4,59	1,335	96,43	,484	,922
	19	76	4,61	1,091	100,95		
	20	43	4,62	1,224	101,66		
	20+	32	4,47	1,459	94,48		

According to the table, the participants' personality traits of extroversion, emotional stability, openness to experience and Agreeableness do not statistically and significantly differ according to their age group (p>0,05); while personality trait of Conscientiousness differed significantly (p<0,05). The difference in the personality trait of Conscientiousness is between the age groups of 19 and 20.

Table 7. Examining the relationship between the participants' personality traits and media literacy

		Extraversion	Emotional Stability	Openness to Experiences	Conscientiousness	Agreeableness
Being informed	r	,163*	,072	-,045	,001	,370**
	p	,022	,317	,533	,984	,000
Ability to analyze and react	r	,129	,073	,025	,020	,318**
	p	,072	,310	,727	,776	,000
Ability to judge and recognize organized messages	r	,223**	,123	,022	-,008	,323**
	p	,002	,086	,761	,907	,000
Total media literacy	r	,190**	,108	-,006	,017	,380**
	p	,007	,130	,938	,814	,000

According to the table, while there is a positive, low level of significant relationship between the participants' extroversion and being informed, ability to judge and recognize organized messages and total media literacy (p<0,05); there was not a significant relationship between their personality trait of extroversion and ability to analyze and react (p>0,05). There is not a significant relationship between emotional stability, openness to experience and media literacy sub-dimensions and total media literacy (p>0,05). There is a positively average and significant relationship between Agreeableness and being informed, ability to analyze and react, ability to judge and recognize organized messages and total media literacy levels (p<0,05).

DISCUSSION AND CONCLUSION

The present study found that being informed, ability to analyze and react, ability to judge and recognize organized messages and total media literacy of the students was average level. Media literacy levels of university students were also examined by various studies in the literature (Hobbs and Tuzel, 2017). A similar study conducted by Som and Kurt (2012: 104) found that the university students' media literacy level was average level; while a study by Tuncer (2013: 79) found that education faculty students' media literacy was above average. Another study by Som and Kurt aimed at examining the media literacy levels of students at different faculties and included 1563 university students. At the end of the study, it was reported that the students were "partly" aware of media literacy and that the majority of the students did not have enough information on the subject of media literacy. A study conducted by Karaman and Karataş (2009: 799) reported that the education faculty students had high levels of media literacy. The results of the studies in the literature were partly parallels with the present study. The reason for this may be because the participants were from different departments and had different levels of interest in media. Also, other studies in the literature (Yılmaz and Özkan, 2013: 178; Som and Kurt, 2012: 112; İnan, 2010: 49) reported that media literacy differed according to the university students' universities and departments.

Considering the gender variable, there was not a significant difference in the media literacy level according to it. The basis for this may be the fact that frequency and reason for male and female students to use the media are similar. Similar studies in the literature examined university students' media literacy levels according to gender variable (Aybek, 2016: 261; Chen et al., 2015: 583). Some studies in the literature also support the result that media literacy of the university students did not differ significantly according to the gender variable (Som and Kurt, 2012: 111; Karataş, 2008: 49). This result is parallel with the present study.

Considering the age variable, media literacy of the students in the study did not differ significantly according to the age variable. The basis of this may be due to the fact that although the students were in different age groups, they were in similar development period and the fact that their interests and demand in the media were similar in the age groups. Studies in the literature also examined media literacy of university students at differeny ages (Kammerl and Pannarale, 2007: 3067; Buckingham, 2007: 43). A similar study carried out by Tuncer (2013: 81) also reported that media literacy of education faculty students was not significantly different according to the age group variable. The result of this study supports the present study.

When the students' personality traits are taken into account, the students had average level of extroversion and above average levels of other personality traits. According to the data, physical education and sports students had versatile personality traits; meaning that students had all the personality traits. The reason for this result may be

because sports support personality development and the features of sports activities (team and individual sports, competitive sports) in which people participate shapes the personality in different ways. In fact, similar studies support the view that engaging in sports supports social skills and personality development (Küçük and Koç, 2015: 5) and that sports branch (team/individual) shapes the psychological structure differently (Salar et al., 2012: 125). Results of these studies also support the present study.

According the gender variable, openness to experience was more highly present in male students and other personality traits did not display difference according to the gender variable. The reason for this may be because female and male students have different styles of upbringing. In fact, similar studies (Özdemir et al., 2012: 569; Lodi-Smith and Roberts, 2007: 68) support the view that upbringing is an important determiner on personality development. Additionally, studies show that parents' attitudes in raising children are also important determiners on personality development (İnanç et al 2017: 1731).

There was a significant difference in having responsible personality according to the age groups. The data showed that compared to 19 year-old students, 20 year-old one had a higher level of responsible personality. There was not a significant difference in the students' personality traits according to their age groups. The basis for this result may be the fact that students have become more responsible as they get older. Findings of similar studies in the literature also support this view. A study by Stephan et al. (2015: 142) claimed that age variable is an important determiner on personality development.

Considering the relationship between the students' personality traits and their media literacy, there was a near-average positive and significant relationship between Agreeableness and being informed, ability to analyze and react, ability to judge and recognize organized messages and total media literacy. The data shows that personality traits are important determiners on media literacy. The reason for this may be because of the fact that the students' media literacy differed according to their personality and their ways of thinking are different. Therefore the students with different thinking structures perceive and interpret the media in a different way. Similar studies in the literature also support the view that media literacy is closely related to thinking skills and cognitive structure (Karabay, 2015: 1173). These results support the present study.

As a result, findings of the present study revealed that there was a statistically significant difference among personality traits of physical education and sports students according to age and gender variables. On the other hand, there was not a statistically significant difference among the students' media literacy levels according to age and gender variables. Additionally, there was a statistically significant relationship between the students' personality traits and their media literacy.

The following are suggestions based on these conclusions:
Children and teenagers can be educated in media literacy that will guide them to do more sports and get physical education and sports,
Similar studies can be conducted on team and individual sports players in various age groups to compare and contrast,
Another similar study can be carried out on physical education and sports teachers, trainer and sports administrators to compare and contrast.
Additional studies examining the relationship between university students' personality traits and media literacy levels can be conducted.
As personality traits and media literacy are influenced by a number of socio-demographic variables, more studies where students' personality traits and media literacy are examined according to different variables (location, parent attitude, grade, department and school type) can be conducted.

REFERENCES

Atak, H. (2013). Adaptation of ten-item personality scale into Turkish culture. *Neuropsychiatry Archive*. 50, 312-319.

Austin, E. W., Muldrow, A. & Austin, B. W. (2016). Examining how media literacy and personality factors predict skepticism toward alcohol advertising. *Journal of Health Communication*, 21(5), 600-609.

Aybek, B. (2016). The relationship between prospective teachers' media and television literacy and their critical thinking dispositions. *Eurasian Journal of Educational Research*, 16(63), 261-278.

Aytaç, S. (2001). Importance of personality in the view of organizational behavior. *Journal of Work and Industry Relationships and Human Resources*, 3 (1).

Buckingham, D. (2007). Digital media literacies: Rethinking media education in the age of the ınternet. *Research in Comparative And İnternational Education*, 2(1), 43-55.

Burger, J. M. (2006). *Personality* (İ. D. E. Sarıoğlu, Translation). İstanbul: Kanküs Publishing.

Can, A. (2014). *Quantitative data analysis via SPSS in the process of scientific research*. Ankara: Pegem Academy.
Chapman, B. P., Duberstein, P. R., Sörensen, S., & Lyness, J. M. (2007). Gender differences in five factor model personality traits in an elderly cohort. *Personality And İndividual Differences,* 43(6), 1594-1603.
Chen, X., Sin, S. C. J., Theng, Y. L. & Lee, C. S. (2015). Why students share misinformation on social media: Motivation, gender, and study-level differences. *The Journal of Academic Librarianship,* 41(5), 583-592.
Costa, P. T., Terracciano, A. & McCrae, R. R. (2001). Gender differences in personality traits across cultures: robust and surprising findings. *Journal of Personality and Social Psychology*, 81(2), 322.
Deveci, H. & Çengelci, T. (2008). A look on prospective social sciences teachers' media literacy. Yüzüncü Yıl University, *Journal of Education Faculty*, 5(2), 25-43.
Gosling, S. D., Rentfrow, P. J. & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, 37(6), 504-528.
Gündüz-Kalan, Ö. (2010). Media literacy and preschool child: a study on parents' media literacy awareness. *İstanbul University, Faculty of Communication Journal*, 1, 59-73.
Hobbs, R. & Tuzel, S. (2017). Teacher motivations for digital and media literacy: An examination of turkish educators. *British Journal of Educational Technology*, 48(1), 7-22.
İnan, T. (2010). *Prospective teachers' media literacy levels and their views on media literacy.* Master's Thesis Dumlupınar University, Institute of Social Sciences. Kütahya.
İnanç, L., Altıntaş, M. & Barış, T. (2015). Relationship between parental attitudes in raising children and personality types. *International Journal of Social Sciences and Education Research*, 3(5), 1731-1745.
İnci, E. (2011). *Kişilik gelişimi*. M. Engin Deniz (Ed.). Development in Early Childhood (p. 123-156). Ankara: Ertem Basım.
Kammerl, R. & Pannarale, S. (2007). *Students in higher education and teacher training programs in germany: their ınternet use, media literacy, and attitude towards elearning*. In Society for Information Technology & Teacher Education International Conference (pp. 3067-3072).
Karabay, A. (2015). Effect of Critical Reading Education on Metacognitive Reading Strategies and Media Literacy. Theory and Implication in Education, 11(4), 1167-1184.
Karaman, M.K. (2010). Evaluating prospective teachers' purpose and expectations of tv and ınternet technology usage in the context of media literacy. *Uşak University Journal of Social Sciences,* 3(2), 51-62.
Karaman, M.K. & Karataş, A. (2009). Media literacy levels of prospective teachers. *Elementary Education Online*, 8(3), 798-808.
Karataş, A. (2008). *Media literacy levels of prospective teachers*. Master's Thesis. Afyon Kocatepe University, Institute of Social Sciences. Afyon.
Kartal, O.Y. & Kıncal, R.Y. (2012). Factors that ınfluence active citizenship levels of psychological counseling and guidance department students who received media literacy. *M.U. Atatürk Faculty of Education, Journal of Educational Sciences*, 36, 169-191.
Kim, Y., Hsu, S. H., & de Zuniga, H. G. (2013). Influence of social media use on discussion network heterogeneity and civic engagement: The moderating role of personality traits. *Journal of Communication*, *63*(3), 498-516.
Korkmaz, Ö. & Yeşil, R. (2011). Study on validity and reliability of media and television literacy levels scale. *International Journal of Human Sciences*, 8(2), 110-126.
Kurt, A.A. & Kürüm, D. (2010). Relationship between media literacy anf critical thinking: A conceptional look. Mehmet Akif Ersoy University. *Journal of Social Sciences Institute*, 2(2), 20-34.
Küçük, V. & Koç, H. (2015). Human and sports relationship in the process of psycho-social development. *Dumlupınar University Journal of Social Sciences*, 10, 1-11.
Lodi-Smith, J. & Roberts, B. W. (2007). Social ınvestment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and Social Psychology Review*, 11(1), 68-86.
McCrae, R. R., Costa Jr, P. T., Hřebíčková, M., Urbánek, T., Martin, T. A., Oryol, V. E., Rukavishnikov, A. A. & Senin, I. G. (2004). Age differences in personality traits across cultures: self-report and observer perspectives. *European Journal of Personality*, 18(2), 143-157.
Önal, H.İ. (2007). Medya okuryazarlığı: Kütüphanelerde yeni çalışma alanı. *Türk Kütüphaneciliği,* 21(3), 335-359.
Özdemir, O., Özdemir, P. G., Kadak, M. T. & Nasıroğlu, S. (2012). Kişilik gelişimi. *Psikiyatride Güncel Yaklaşımlar*, 4(4), 566-589.
Paris, J. (2004). Gender differences in personality traits and disorders. *Current Psychiatry Reports*, 6(1), 71-74.
Salar, B., Hekim, M. & Tokgöz, M. (2012). Comparing emotional states of ındividuals aged 15-18 doing team or ındividual sports. *Mehmet Akif Ersoy University Journal of Social Sciences Institute*, 4(6), 123-135.
Skaar, H. (2009). In defence of writing: A social semiotic perspective on digital media, literacy and learning. *Literacy*, 43(1), 36-42.

Solmaz, B. & Yılmaz, R.A. (2012). Media literacy research and an ımplication at Selçuk University. *Selçuk University Faculty of Communication Academic Journal*, 7(3), 55-61.

Som, S. & Kurt, A.A. (2012). Media literacy levels of computer and ınstructional technologies department students. *Anadolu Journal of Educational Sciences International*, 2(1), 104-119.

Soto, C. J., John, O. P., Gosling, S. D. & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big five domains and facets in a large cross-sectional sample. Journal of Personality and Social Psychology, 100(2), 330-348.

Stephan, Y., Sutin, A. R. & Terracciano, A. (2015). Subjective age and personality development: A 10-year study. *Journal of Personality*, 83(2), 142-154.

Tuncer, A. (2013). *Media literacy levels of education faculty students (Sample of İzmir).* Master's Thesis, Ege University Institute of Social Sciences. İzmir.

Ünlü, Y. (2017). *Examining the relationship between physical education and sports teachers' media literacy levels and critical literacy levels*. Master's Thesis. Bartın University Institute of Educational Sciences. Bartın.

Yılmaz, Ö. & Özkan, B. (2013). Comparing media literacy levels of prospective computer and ınstructional technologies teachers and preschool teachers. *Electronic Journal of Vocational Colleges*, 178-183.

Online Teaching Skills and Competencies

Fatimah A Albrahim, PhD
Ministry of Education, Saudi Arabia
fa961211@ohio.edu

ABSTRACT
This paper sheds light on the skills and competencies required for teaching online courses in higher education. The paper started with an overview of the issues related to online learning and teaching. Reviewing and analyzing literature in this topic were performed to confine skills and competencies that instructors need to effectively teach in online learning environments. These skills and competencies are classified into six categories: (a) pedagogical skills, (b) content skills, (c) design skills, (d) technological skills, (e) management and institutional skills, and (f) social and communication skills.

INTRODUCTION

Being a university professor is a dream for graduate students who desire to embark on a career in academia. Despite the relatively low average salary (US $74,000 per year) (The United States [US] Bureau of Labor Statistics [BLS], 2014), teaching remains one of the most prestigious jobs in the US (Pollack, 2014). Moreover, CareerCast (2014) ranks the tenured university professor career as the second-best job in 2014, as it is more stable and less stressful than most of the other careers on that list.

The CareerCast list was created by analyzing data from the BLS and other government agencies based on the environmental, income, outlook, and stress aspects of each career (CareerCast, 2014). According to the BLS (2014), teaching in postsecondary institutions has a low unemployment rate and a projected growth-in-employment rate of 19% from 2012 to 2022. Although the stability of a job makes it less stressful, the nature and responsibilities of teaching may be stressful and could put pressure on those who choose to pursue a career in this field.

The landscape of higher education has changed dramatically in the last twenty years (Staley & Trinkle, 2011). The rapid growth in higher education enrollment and employment has been steady. In the fall of 2013, about 1.5 million individuals were responsible for teaching almost 21 million students at more than 7,000 postsecondary institutions in the US (Ginder, Kelly-Reid, & Mann, 2014a, 2014b). This growth is also associated with changes in the intellectual, institutional, and technological aspects of higher education (Scobey, 2012).

The characteristics of higher education institutions, employment, and students have altered over the last decade. Today, there is more variety in the tiers and types of programs and degrees offered by different levels and types of institutions (i.e., public, private for profit, private nonprofit, four-year and higher, two-year, and less-than-two-year) (Ginder et al., 2014b). The number of full-time instructional faculty members is now almost equal to the number of those who teach part-time (Kena et al., 2014), and the typical image of traditional undergraduate students has changed to include those who were previously known as nontraditional. Global, social, political, economic, cultural, technological, and educational factors have spurred these changes (Palloff & Pratt, 2013; Siemens & Matheos, 2010).

The ubiquity of information technology and communication has significantly reshaped the structure of learning in higher education. Classroom boundaries have exceeded the realms of time, location, and physical presence (Barber, Donnelly, Rizvi, & Summers, 2013). It is the era of anytime and anywhere learning (Paulson, 2002). New teaching pedagogies, learning skills, and assessment methods have emerged to adapt to these changes (Barber et al., 2013). In addition, new formats of learning have thrived. A large number of courses, certificates, and degrees have been earned through attending open universities, online education, or massive open online courses (MOOCs) (Allen & Seaman, 2014; Siemens & Matheos, 2010).

These changes represent challenges that may burden instructional staff in higher education who have to keep pace with the innovative paradigms of higher education, new approaches to research and accreditation, and new methods of teaching and learning (Siemens & Matheos, 2010). This includes being aware of who the students are, what they need to learn, how to teach them, as well as the skills that they, as instructors, need to master in order to effectively execute their role (Palloff & Pratt, 2013; Scobey, 2012). The purpose of this paper is to

provide an overview of the skills and competencies that can help instructional staff and educators to cope with the contemporary paradigms of learning in higher education.

THE TRANSFORMATION OF LEARNING IN HIGHER EDUCATION

Much has been written about how the goals and policies of higher education have transformed over the decades. This shift is legitimate. As with any other phenomenon in life, education is impacted by surrounding factors and influences (Siemens & Matheos, 2010).

Education outcomes are shifting from focusing solely on cognitive development toward personal, social, and economic development (Eckel & King, 2004; Hanson, 2014; Trapp, 2012). Financial issues, which include the cost of attendance, tuition, and fees, have various themes and patterns (Ginder et al., 2014b). Consequently, the concepts of teaching, learning, and being a teacher or learner have been remodeled (Trapp, 2012). Different models of teaching impact the relationship between the teacher and the learner and describe the teaching and learning processes (Groccia, 2012). However, the following question may arise: What is the most effective model of teaching?

Interestingly, in the educational literature, the examination of the effectiveness of a model or method of teaching is always introduced as a comparison with traditional learning or teaching. In a large body of literature, traditional learning has been considered an antonym of new types of learning, such as e-learning, as well as virtual, cyber, hybrid, and online learning (Gaytan & Pasaro, 2009; Moazami, Bahrampour, Azar, Jahedi, & Moattari, 2014; Muniasamy, Ejalani, & Anandhavalli, 2014). Other researchers have used the term traditional learning to draw a conclusion regarding the employment of a specific method of teaching, such as cooperative learning (Basak & Yildiz, 2014; Khan & Ahmad, 2014), problem-based learning (Deo, 2014; Mughal, et al., 2014; Pourshanazari, Roohbakhsh, Khazaei, & Tajadini, 2013; Stefanou, Stolk, Prince, Chen, & Lord, 2013), project-based learning (Bell, 2010; Çibik & Yalçin, 2013; Isik & Gucum, 2013), and game-based learning (Liao, 2011; Ronimus, Kujala, Tolvanen, & Lyytinen, 2014). This leads one to wonder what traditional learning is.

There is no consistency in the literature regarding the precise definition of traditional learning (sometimes conventional). McInnerney and Roberts (2004) refer to the idea of the sage on the stage as a common description of traditional learning. In such a model, the instructor is the active party who transfers information to the learners through lectures and printed materials via a kind of interaction between the learners and both the instructor and the content. Lee and Tsai (2011) define traditional learning as "delivering learning material face-to-face with no use of the Internet for teaching and learning" (p. 908). Targamadzė and Petrauskienė (2010) consider traditional learning as "a process of learning that takes place under the supervision of a teacher in a physical learning environment when using physical tools of learning and direct synchronous communication" (p. 171). Allen and Seaman (2014) label as traditional only those courses that lack any online technology. These definitions imply that traditional learning is a process of learning, a method of teaching, and a medium of delivering instruction. The instructor and learner synchronously interact and communicate, as they are physically and simultaneously present in the same room without the facilitation of the Internet and online technology.

However, the actual situation surrounding higher education classes differs from this image. The latest report by the Babson Survey Research Group states that only a very small number of institutions in the US have no online offerings (Allen & Seaman, 2014). Moreover, almost all public institutions fall outside of this small number (Allen & Seaman, 2014). Students come to the classroom holding in their hands their own devices that are connected to the Internet through cellular data plans or the Wi-Fi offered by the institution (Palloff & Pratt, 2013; Parker, Lenhart, & Moore, 2011). E-books, wikis, YouTube videos, and social media are available as learning and teaching materials and resources (Fulton, 2012; Ravid, Kalman, & Rafaeli, 2008; Reuben, 2008; Siemens & Matheos, 2010). Instructors use learning management systems (LMSs) to upload the syllabus and as a testing and grading portal (Georgouli, Skalkidis, & Guerreiro, 2008; Palloff & Pratt, 2013). Both the instructor and the students need to have access to the Internet in what is known as the traditional classroom.

In addition to traditional courses, Allen and Seaman (2014) provide a classification for courses according to how Internet technology contributes to their delivery. Web-facilitated courses are face-to-face courses that use the Internet to deliver less than 30% of the content by posting the learning materials and assignments to an LMS. When less than 80% of the course content and activities are presented through the Internet, the course is called hybrid or blended. Online courses are completely delivered and taught online. Thus, it may be the right time to argue in favor of switching to a new paradigm for traditional learning. Indeed, it may be useful to consider web-facilitated or blended learning as the new traditional learning (Palloff & Pratt, 2013).

ONLINE LEARNING AT A GLANCE

Definitions of Online Learning: Since the flourishing of online learning, a large number of terminologies and definitions have been used to describe it. Examples of the terms that are commonly used to describe online learning include e-learning, virtual learning, cyber learning, Internet learning, distributed learning, web-facilitated learning, web-based learning, distance learning, computer-based learning, resource-based learning, and technology-based learning (Ally, 2008; Anohina, 2005; Moore, Dickson-Deane, & Galyen, 2011; Moore & Kearsley, 2011; Rudestam & Schoenholtz- Read, 2010). The term online learning will be used throughout this paper. The wide variety of terms results in different definitions of online learning as well.

Authors, researchers, theorists, and educators have defined online learning in a variety of ways and from the angles of various perspectives and disciplines. Means, Toyama, Murphy, and Baki (2013) define online learning as learning that occurs entirely (purely online learning) or partially (blended learning) through the Internet. In another publication, Bakia, Shear, Toyama, and Lasseter (2012) view online learning as "instructional environments supported by the Internet" (p. 2). Ally (2008) describes online learning as a learning experience that allows for growing, acquiring knowledge, and constructing personal meaning by providing access to learning materials through the Internet; interacting with the content, instructor, and other learners; and obtaining support during the learning process.

Moreover, new formats of online learning, such as mobile learning and MOOCs, have emerged. Mobile learning is "learning that takes place in learning environments and spaces that take account of the mobility of technology, mobility of learners and mobility of learning" (El- Hussein & Cronje, 2010, p. 20). MOOCs are a combination of online learning and open educational resources (Bali, 2014). MOOCs are free of charge, open, and non-credit courses that are offered by some higher education institutions over the Internet (Allen & Seaman, 2014).

BENEFITS OF ONLINE LEARNING

The debate regarding the effectiveness of online learning has been raging for decades. Both technological optimists and skeptics have argued over whether moving toward online learning would yield better learning outcomes than face-to-face learning (Palloff & Pratt, 2013). Yet, it is apparent that online learning has been popularized as a substantial component at the majority of higher education institutions (Allen & Seaman, 2014). Furthermore, almost three- quarters of academic leaders believe that the learning outcomes of online learning are similar to or better than those of face-to-face education (Allen & Seaman, 2014; Bell & Federman, 2013).

Remarkably, the trends in online learning research have now moved toward investigating how different elements and features of online learning influence its effectiveness (Bell & Federman, 2013).

Some reported benefits of online learning for the learners include offering more flexible learning experiences, opening channels for synchronous and asynchronous communication and interaction, allowing for more collaboration and interaction with peers, providing access to learning resources in various formats, and promoting authentic and situated learning (Ally, 2008; Davies, 2014; Fuller & Yu, 2014). Bell and Federman (2013) argue that online learning has the potential to afford and support access to higher education for those who have socioeconomic, academic, and health issues that prevent them from attending on-site classes. Keengwe, Schnellert, and Kungu (2014) add to the noted benefits the potential of online learning to offer cross-cultural experiences in which learners can learn about and communicate with people from other cultures. They also cautiously mention feeling anonymous as another benefit of online learning. Although anonymity may have some disadvantages, it can give the learners more freedom to participate in the learning activities.

Online instructors can also benefit from online learning. The advantages that they may gain include more flexibility in regard to teaching location and hours; being able to reuse and immediately update the learning materials; increasing the number of ways to individually communicate, supervise, and direct learners; and enhancing their ability to determine learners' educational needs and design personalized learning experiences accordingly (Ally, 2008).

Alman and Tomer (2012) note that teaching online may provide opportunities for online instructors to learn about the principles of instructional design and technology, online pedagogies, and emergent technologies. Online teaching, therefore, would help faculty members to expand their professional community, exchange best practices and feedback, and enhance their teaching and career portfolios (Alman & Tomer, 2012).

CONCERNS ABOUT ONLINE LEARNING

Along with amassing evidence in favor of the usefulness of online learning, concerns about the problems that might emerge in online environments have grown. First, it is important to note that online learning is not a replacement for face-to-face education (Palloff & Pratt, 2013). Moreover, educators should be aware that there is

no sole online learning format that is suitable for all faculty and students (Palloff & Pratt, 2013). Cheating and plagiarism are among the most pressing concerns about online learning (Fuller & Yu, 2014) and acts as a threat to students' academic integrity (Bell & Federman, 2013).

Institutions have made efforts to minimize concerns about cheating in online courses. For instance, exams can be taken on campus or at testing centers, types of assessment other than exams can be employed, questions can be randomized or pooled from question banks, and adherence to the policies of academic integrity and dishonesty should be declared (Bell & Federman, 2013; Fuller & Yu, 2014). Another concern relates to learners' retention in online learning environments. Dropout rates are higher in online courses than face-to-face ones. This is primarily due to technical and access problems (Bell & Federman, 2013). More to the point, faculty, students, and administrators must be educated about the pedagogical, administrative, technological, and technical aspects of online learning to face and solve any problems and concerns they may encounter (Palloff & Pratt, 2013).

TEACHING IN ONLINE LEARNING ENVIRONMENTS

Instructors in higher education face challenges due to the previously mentioned changes and circumstances. They may experience feelings of discomfort when dealing with technology-enriched classrooms and related issues (Palloff & Pratt, 2013). Some of the issues that might deter faculty members from teaching online include wondering if they are qualified to teach online, how to maintain their own identities and attributes as instructors, what the learners' demographic might be, how to meet discipline-related demands, what kind of training they would need, how to be successful online instructors, how to assess and evaluate learning outcomes, and how to deal with stress and feelings of frustration while making the transition to online learning environments (Alman & Tomer, 2012; Palloff & Pratt, 2013).

Generally speaking, faculty members receive very little training and preparation for teaching in higher education (Palloff & Pratt, 2013). Having said that, the impact of this lack of preparation is magnified in online learning environments. Teaching online and technology- enriched courses requires adapting pedagogical practices that are more compatible with the integration of technology at the postsecondary level (Bailey & Card, 2009). The principles of feedback, andragogy, constructivism, and transformative learning seem to be more appropriate to proclaiming the learner-centered approach, which is one of the online learning foundations (Bailey & Card, 2009). Online instructors must pay attention to what they need to create, develop, and manage their online courses and how to effectively communicate with the learners in the absence of physical presence and interaction. For both instructors and learners, it is crucial to consider time management issues. It is also important to note that the sense and control of time have different patterns in online courses (Alman & Tomer, 2012).

The roles, characteristics, competencies, and skills that one requires to be a competent and successful online instructor should be identified and highlighted by educational institutions, online learning organizations and authorities, and online learning theorists. Online faculty members need a framework and guideline that support them, improve their skills, and help to design adequate training programs (Munoz-Carril, Gonzalez-Sanmamed, & Hernandez-Selles, 2013). Furthermore, Bawane and Spector (2009) develop a general framework to help design and create professional development programs for teachers. According to this framework, determining the goals and inputs of training programs correlates with understanding the instructor's roles and tasks and then identifying the required skills and competencies (Bawane & Spector, 2009). In addition, online instructional staff might better understand their role as online faculty if they are introduced to examples of exemplary online instructors and consider them role models (Baran, Correia, & Thompson, 2013).

CHARACTERISTICS OF THE EXCELLENT ONLINE INSTRUCTOR

The excellent online instructor should understand the nature of both face-to-face and online learning and the differences between them and should employ this understanding in implementing and facilitating online classes (Palloff & Pratt, 2011). Teaching online necessitates a commitment to the principles of online learning in order to be able to create and maintain a teaching, social, and cognitive presence. Successful online instructors promote and facilitate students' active communication, interaction, collaboration, and engagement throughout the online course (Palloff & Pratt, 2011). These instructors should possess personal traits such as being highly motivated, supportive, visible, organized, analytical, respectful, approachable, active, responsive, flexible, open, honest, compassionate, and able to lead by example (Keengwe et al., 2014; Savery, 2005).

THE ROLES OF ONLINE INSTRUCTORS

Faculty members who decide to teach online courses are apt to carry out roles and responsibilities other than merely providing instruction. The International Society for Technology in Education (ISTE) has developed five sets of standards "for learning, teaching and leading in the digital age" (ISTE, 2014, para. 2). One group of

standards is the ISTE standards for teachers, which depicts the exemplar teaching with technology. These standards affirm that instructors should (a) facilitate and inspire student learning and creativity, (b) design and develop digital-age learning experiences and assessments, (c) model digital-age work and learning, (d) promote and model digital citizenship and responsibility, and (e) engage in professional growth and leadership (ISTE, 2008).

Goodyear, Salmon, Spector, Steeples, and Tickner (2001) identify eight roles for an instructor in online teaching: researcher, content facilitator, technologist, designer, manager or administrator, process facilitator, advisor or counselor, and assessor. Similarly, Bawane and Spector (2009) and Munoz Carril et al. (2013) classify the roles of online instructors into eight categories: (a) pedagogical, (b) social, (c) evaluative, (d) administrative, (e) technological, (f) personal, (g) advisory, and (h) researchering. They view being an instructional designer, course developer, content expert, tutor, organizer, facilitator, and professional as secondary roles within the pedagogical role.

ONLINE TEACHING COMPETENCIES

Competencies for online instruction have been categorized at different levels in the literature, and several approaches have been adopted to classify them. Salmon (2003) describes and groups the qualities or competencies of e-moderators into five categories: (a) understanding the online process, (b) technical skills, (c) online communication skills, (d) content expertise, and (e) personal characteristics. ISTE's (2001) standards for technology facilitation compile competencies that aid technology facilitators to execute their duties. These competency groups include (a) technology operations and concepts; (b) planning and designing learning environments and experiences; (c) teaching, learning, and developing the curriculum; (d) assessment and evaluation; (e) productivity and professional practice; (f) social, ethical, legal, and human issues; (g) procedures, policies, planning, and budgeting for technology environments; and (h) leadership and vision. These standards have been extensively employed in myriad online projects and studies.

Some researchers briefly list online competencies as personal, social, pedagogical, and technological in addition to a set of competencies related to the content, design, communication, and management (Baran & Correia, 2014; Guasch, Alvarez, & Espasa, 2010; Palloff & Pratt, 2011; Smith, 2008). Dubins and Graham (2009) examine 17 online learning programs to formulate eight competency categories: (a) content management system (CMS) skills, (b) other technical skills, (c) instructional design, (d) social processes and presence, (e) managing assessment, (f) orienting students, (g) institutional knowledge, and (h) pedagogy and andragogy.

Other researchers go further by developing a framework that classifies and summarizes a cluster of competencies. The framework developed by Abdous (2011) in Figure 1 illustrates three stages. The first stage contains before-teaching practices that included preparing, planning, and designing. During the teaching stage, there is facilitating, interacting, and providing and seeking feedback competencies. Finally, online instructors have to demonstrate the competencies of reflecting and drawing on lessons learned. Bigatel, Ragan, Kennan, May, and Redmond (2012) specify the competencies based on successful online teaching tasks into seven categories:
(a) active learning, (b) administration and leadership, (c) active teaching and responsiveness, (d) multimedia technology, (e) classroom decorum, (f) technological competence, and (g) policy enforcement.

In 2008, Maryland Online (MOL) constructed a professional development project titled Certificate for Online Adjunct Teaching [COAT] for online faculty. COAT develops competencies for online teaching, including (a) orienting students to online learning, (b) technology skills, (c) LMS skills, (d) basic instructional design principles, (e) pedagogy and andragogy, (f) social process and presence, (g) Internet safety for k-12; (h) managing assessment, and (i) legal and institution-specific policy and procedure (MOL, 2014). A number of institutions other than Maryland have adopted this program to prepare their instructional staff for online teaching.

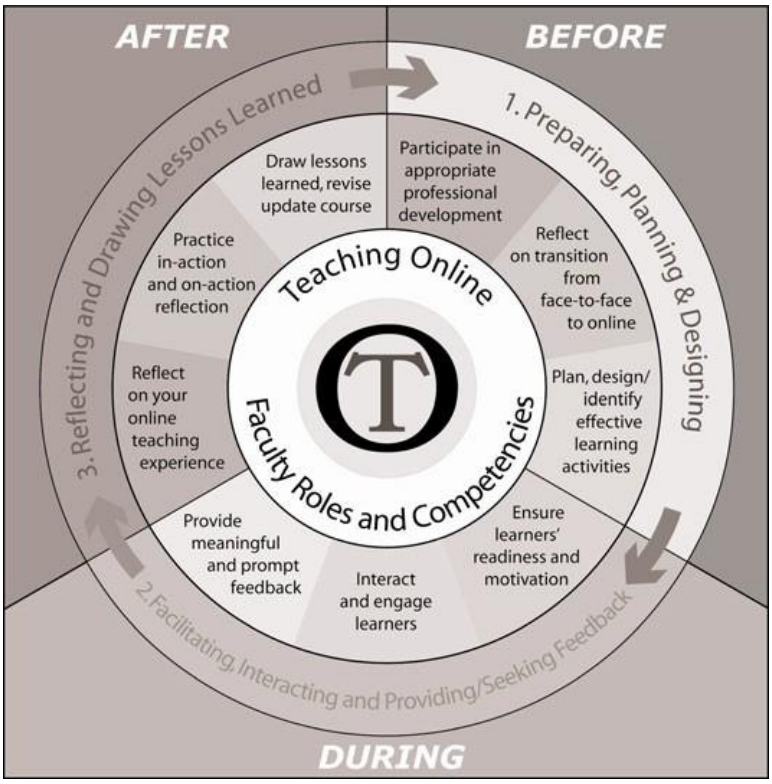

Figure 1. A framework for acquiring online teaching competencies. Adapted from M. H. Abdous (2011), "A Process-Oriented Framework for Acquiring Online Teaching Competencies," *Journal of Computing in Higher Education, 23*(1), p. 65.

To some extent, the above-mentioned categories illustrate the high expectations among online instructors to possess varied competencies and perform different roles and tasks. Although this issue seems rational, practically, it is difficult for online instructors to focus equally on all the identified roles. Simplifying this somewhat, the competencies of online teaching have to be labeled and prioritized according to the roles the instructors will actually execute (Bawane & Spector, 2009). Institutions might offer technical support for using LMSs and other technologies, and this might reduce the online instructors' load. However, it is important to acquire sufficient knowledge of how to troubleshoot and handle technical problems (Alman & Tomer, 2012).

Table 1. *Categorization of Online Teaching Competencies*

Researcher(s)	Communication	Pedagogy	Technology	Design	Management	Instructional	Social	Assessment	Orienting students	Institutional	CM S/LMS	Personal	Content	Professional
ISTE (2001)		X	X	X	X		X			X			X	X
Salmon (2003)	X	X	X									X	X	
Simth (2008)	X	X	X	X	X									
Dubins and Graham (2009)		X	X	X		X	X	X	X	X	X			
Guasch et al. (2010)		X	X	X	X		X							
Abdous (2011)	X	X	X	X	X									

Palloff and Pratt (2011)			X	X									X	X		
Bigatel et al. (2012)			X	X		X					X					
Baran and Correia (2014)			X	X										X		
COAT (2014)	X	X	X	X		X	X	X	X		X	X				X

Competencies from previous studies are organized in Table 1 to allow for the inspection of which categories are more frequently displayed in the literature. Pedagogy, technology, design, content, management, institutional, communication, and social have received more focus in a larger number of studies. It also seems that communication and institutional competencies are used interchangeably with social and management respectively to imply a similarity in competencies. This result is compatible with Technological Pedagogical Content Knowledge (TPACK), which was developed by Koehler and colleagues. TPACK is an enhanced version of the pedagogical content knowledge built by Lee Shulman. According to TPACK, effective teaching with technology occurs when teachers have a body of knowledge that resulted from a complex interaction among the knowledge of content, pedagogy, and technology (Koehler, Mishra, & Cain, 2013).

In this paper, online teaching skills are, therefore, itemized as task or performance statements belonging to one of these six categories (i.e., pedagogy, technology, design, content, management and institutional, and social and communication).

SKILLS FOR ONLINE TEACHING

Pedagogical Skills: Effective online instructors should understand the fundamentals of online teaching and pedagogy. They must demonstrate this understanding through applying a large number of principles and strategies. These principles and strategies include:

- Learning theories, such as learning styles, the adult learning theory, the learner-centered approach, and collaborative learning;
- Designing and implementing appropriate instructional strategies, as well as classroom assessment and student engagement techniques;
- Organizing and facilitating students' participation and providing guidance and support as needed;
- Using criterion-based assessment to evaluate individual and group performance;
- Motivating students and showing enthusiasm and interest;
- Encouraging knowledge construction based upon learners' prior knowledge and life experience;
- Fostering learners' self-assessment and reflection; and
- Promoting group interaction, collaboration, and teamwork.

(Abdous, 2011; Bailey & Card, 2009; Bailie, 2011; Bawane & Spector, 2009; Craddock & Gunzelman, 2013; Munoz Carril et al., 2013)

Content Skills: Online instructors must be able to do the following:

- Expressing and mastering extensive knowledge of the content;
- Stating learning goals and objectives that coincide with learners' levels and characteristics;
- Drafting and developing learning and assessment activities that align with learning goals and objectives;
- Developing a course outline that includes all course components and elements;
- Designing a teaching proposal at the general level and identify each of its phases or elements;
- Developing and selecting appropriate and varied learning resources that accommodate different learning styles and preferences;
- Linking the subject and content with scientific, social, cultural, and any other relevant phenomena; and
- Developing an inventory of existing content and resources and any additional content and resources that will be needed.

(Abdous, 2011; Bailie, 2011; Bailey & Card, 2009; Bawane & Spector, 2009; Munoz Carril et al., 2013)

Design Skills: Designing and developing online courses is a demanding task. It requires having a design and production team, which consists of an instructional designer, instructional technologist, graphic and media designers and production team, and librarians (Abdous, 2011). These individuals work collaboratively to produce high-quality online courses (Haughton, Sandt, & Slantcheva-Durst, 2014). However, online instructors must be able to do the following:

- Understanding and applying instructional design principles, models, and theories;

- Organizing and presenting the learning materials in different formats;
- Cooperating with the production team to design learning activities and select appropriate tools and techniques to present these activities; and
- Using students' previous feedback to develop and design new courses and assess the course design quality by using quality assurance tools and instruments, such as the Quality Matters Rubric.

(Abdous, 2011; Bawane & Spector, 2009; Munoz Carril et al., 2013; Newby, Eagleson, & Pfander, 2014)

Technological Skills: Although online learning relies heavily on technology, there is no imperative need for online instructors to be technologically advanced. Online instructors have to possess adequate technological literacy skills to be able to do the following:

- Accessing various technological resources and tools, such as email, Internet browsers, LMSs, text and video chat applications, and productivity software and applications;
- Understanding the learning and teaching capabilities and limitations of these tools;
- Being aware of the technical potential of, and procedures used to create, e-content, such as e- books and instructional videos; and
- Being alert to the latest updates and renovations of educational technology and software. (Abdous, 2011; Alman & Tomer, 2012; Bailie, 2011; Bailey & Card, 2009; Bawane &

Spector, 2009; Munoz-Carril et al., 2013)

Management and Institutional Skills: As classroom management is an important aspect of face-to-face education, managing courses and learning is essential in online learning environments. An awareness of institutional policies and norms is also an important aspect of being a successful online instructor. Skills and tasks related to these two aspects include the following:

- Being able to clarify the roles and expectations of the instructor and the learners;
- Managing the course time and applying time-saving techniques;
- Demonstrating leadership, management, mentoring, and coaching skills, as well as knowledge of administrative qualities and procedures;
- Tracking course and students' progress on a regular basis;
- Establishing and declaring rules and regulations for participation, submission of assignments, timeliness, sending and seeking feedback, and communication protocols;
- Conducting research on classroom teaching then interpreting and integrating research findings and results;
- Understanding and demonstrating commitment to institutional policies;
- Maintaining contact and networking with online teaching and administrative teams; and
- Complying with legal, ethical, and copyright issues and standards.

(Bailie, 2011; Bawane & Spector, 2009; Craddock & Gunzelman, 2013; Munoz Carril et al., 2013).

Social and Communication Skills: Active communication and social presence are vital to engaging online learners. Using different communication tools (e.g., email, video chat, text messages, etc.), online instructors have to efficiently communicate and promote interactivity among the learners. Some activities to achieve this include the following:

- Facilitating and maintaining interactive discussion and information exchange;
- Using sufficient and commonly understandable language;
- Respecting and considering cultural differences;
- Clearly requesting information and asking questions;
- Clarifying the purpose and meaning of messages and feedback;

- Emphasizing the important points using font colors and effects;
- Ensuring the quality and accuracy of written messages and feedback and detecting typographical and grammatical errors;
- Personalizing messages and feedback and making them more lively by adding the appropriate sense of humor when possible;
- Using different communication methods to ensure accessibility among the instructor and learners, and the learners with their peers;
- Maintaining a warm, friendly, and inviting collegial atmosphere;
- Creating and developing respectful relationships and a sense of community among the learners;
- Showing sensitivity and empathy when communicating online;
- Resolving conflicts and misunderstandings amicably; and
- Offering advice and suggestions and clarifying doubts and suspicions.

(Abdous, 2011; Bailie, 2011; Bawane & Spector, 2009; Craddock & Gunzelman, 2013; Fuller & Yu, 2014;

Munoz Carril et al., 2013)

All these skills, tasks, and competencies can help in designing and creating professional development opportunities for online educators. Needs assessment analysis tools and instruments may be built based on these qualities to determine professional development goals and procedures (Baran & Correia, 2014). Online instructors can also use these to self-evaluate their competencies and then recognize their own learning and training needs as adult, self-regulated, and self-determined learners (Baran et al., 2013). Finally, competencies can serve as a protocol to ensure instructors' readiness and qualification to teach in online learning environments.

CONCLUSION

Online teaching is demanding. Faculty members might feel uncomfortable teaching online courses due to the multiple roles and responsibilities of teaching online. Online teaching skills and competencies have to be determined in order to help design professional development programs for online instructors. These skills and competencies are classified into six categories:

(a) pedagogical skills, (b) content skills, (c) design skills, (d) technological skills, (e) management and institutional skills, and (f) social and communication skills. Online faculty can use these sets of skills to self-evaluate their abilities to teach online and identify their training needs.

REFERENCES

Abdous, M. H. (2011). A process-oriented framework for acquiring online teaching competencies. *Journal of Computing in Higher Education, 23*(1), 60-77.

Allen, I. E., & Seaman, J. (2011). *Going the distance: Online education in the United States, 2011*. Babson Survey Research Group and Quahog Research Group.

Allen, I. E., & Seaman, J. (2014). *Grade change: Tracking online education in the United States*. Babson Survey Research Group and Quahog Research Group.

Ally, M. (2008). Foundations of educational theory for online learning. In Anderson, T. (Ed.), *Theory and practice of online learning* (pp. 15-44). Edmonton : AU Press.

Alman, S. W., & Tomer, C. (2012). Designing online learning: A primer for librarians. ABC- CLIO.

Anohina, A. (2005). Analysis of the terminology used in the field of virtual learning. *Educational technology & society*, *8*(3), 91-102.

Bailey, C. J., & Card, K. A. (2009). Effective pedagogical practices for online teaching: Perception of experienced instructors. *The Internet and Higher Education, 12*(3), 152- 155.

Bailie, J. L. (2011). Effective online instructional competencies as perceived by online university faculty and students: A sequel study. *Journal of Online Learning and Teaching, 7*(1), 82- 89.

Bakia, M., Shear, L., Toyama, Y., & Lasseter, A. (2012). Understanding the Implications of Online Learning for Educational Productivity. *Office of Educational Technology, US Department of Education*.

Bali, M. (2014). MOOC pedagogy: Gleaning good practice from existing MOOCs. *Journal of Online Teaching and Learning (JOLT), 10*(1), 44-56.

Baran, E., & Correia, A. P. (2014). A professional development framework for online teaching. *TechTrends, 58*(5), 95-101.

Baran, E., Correia, A. P., & Thompson, A. (2011). Transforming online teaching practice: critical analysis of the literature on the roles and competencies of online teachers. *Distance Education, 32*(3), 421-439.

Baran, E., Correia, A. P., & Thompson, A. (2013). Tracing successful online teaching in higher education: Voices of exemplary online teachers. *Teachers College Record, 115*(3), 1-41.

Barber, M., Donnelly, K., Rizvi, S., & Summers, L. (2013). *An avalanche is coming: Higher education and the revolution ahead*. Institute for Public Policy Research, London, UK. Retrieved from: http://www. ippr. org/publication/55/10432/an-avalanche-iscoming- higher-education-and-the-revolution-ahead

Basak, T., & Yildiz, D. (2014). Comparison of the effects of cooperative learning and traditional learning methods on the improvement of drug-dose calculation skills of nursing students undergoing internships. *Health Education Journal*, *73*(3), 341-350.

Bawane, J., & Spector, J. M. (2009). Prioritization of online instructor roles: Implications for competency-based teacher education programs. *Distance Education, 30*(3), 383-397.

Bell, B. S., & Federman, J. E. (2013). E-learning in Postsecondary Education. *The Future of Children*, *23*(1), 165-185.

Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House, 83*(2), 39-43.

Bigatel, P. M., Ragan, L. C., Kennan, S., May, J., & Redmond, B. F. (2012). The identification of competencies for online teaching success. *Journal of Asynchronous Learning Networks*, *16*(1), 59-77.

CareerCast. (2014). The best jobs of 2014. Retrieved from http://www.careercast.com/jobs- rated/best-jobs-2014

Çibik, A. S., & Yalçin, N. (2013). The effect of project based learning supported with analogies method on success and understanding level for electric current concept. *Journal of Turkish Science Education (TUSED), 10*(3), 123-136.

Craddock, J., & Gunzelman, R. (2013). Creating WOW: Characteristics of successful online instruction and facilitation. *The Journal of the Virtual Classroom*, 26.

Davies, A. (2014). Integrating e-learning to improve learning outcomes: a proven way for teachers to engage students and improve learning outcomes is through the appropriate use of e-learning and Web 2.0 tools in teaching. *Planning for Higher Education Journal, 42*(4), 23-29.

Deo, S. K. (2014). Human Resources and Logistic Requirements in Problem Based Learning Compared to Traditional Learning. *Nepal Orthopaedic Association Journal, 3*(2), 46-47.

Dubins, B. H., & Graham, M. B. (2009, August). *Training instructors to teach online: Research on competencies/best practices*. Paper presented at the 25th Annual Conference on Distance Teaching and Learning, Madison, WI. Retrieved from http://www.uwex.edu/disted/conference/Resource_library/proceedings/09_20433.pdf

Eckel, P. D., & King, J. E. (2004). An overview of higher education in the United States: Diversity, access, and the role of the marketplace. American Council on Education.

El-Hussein, M. O. M., & Cronje, J. C. (2010). Defining mobile learning in the higher education landscape. *Educational Technology & Society, 13*(3), 12-21.

Fuller, P., & Yu, G. (2014). Lessons learned: online teaching adventures and misadventures. *Journal of Social Sciences, 10*(1), 33-38.

Fulton, K. (2012). Upside down and inside out: Flip your classroom to improve student learning. Learning & Leading with Technology, 39(8), 12-17.

Gaytan, S., & Pasaro, R. (2009, October). *The combined use of E-learning and traditional learning systems for students of biology and biochemistry*. Paper presented at the Eighth European Conference on E-Learning, University of Bari, Italy.

Georgouli, K., Skalkidis, I., & Guerreiro, P. (2008). A Framework for Adopting LMS to Introduce e-Learning in a Traditional Course. *Educational Technology & Society, 11*(2), 227-240.

Ginder, S.A., Kelly-Reid, J.E., & Mann, F. B. (2014a). Enrollment in postsecondary institutions, fall 2013; financial statistics, fiscal year 2013; and employees in postsecondary institutions, fall 2013. First Look (Provisional Data) (NCES 2015-012). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubsearch.

Ginder, S.A., Kelly-Reid, J.E., & Mann, F. B. (2014b). Postsecondary institutions and cost of attendance in 2013-14; degrees and other awards conferred, 2012-13; and 12-month enrollment, 2012-13: First look (Provisional data) (NCES 2014-066rev). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved from http://nces.ed.gov/pubsearch.

Goodyear, P., Salmon, G., Spector, J. M., Steeples, C., & Tickner, S. (2001). Competences for online teaching: A special report. *Educational Technology Research and Development, 49*(1), 65-72.

Groccia, J. E. (Ed.). (2012). *Handbook of college and university teaching: A global perspective*. Sage Publications.

Guasch, T., Alvarez, I., & Espasa, A. (2010). University teacher competencies in a virtual teaching/learning environment: Analysis of a teacher training experience. *Teaching and Teacher Education, 26*(2), 199-206.

Hanson, C. (2014). Changing how we think about the goals of higher education. *New Directions for Higher Education, 2014*(166), 7-13. doi: 10.1002/he.20090

Haughton, N., Sandt, D., & Slantcheva-Durst, S. (2014, June). Effective online teaching and learning environments captured through course syllabi: an exploratory quantitative content analysis. Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications, Tampere, Finland.

International Society for Technology in Education [ISTE]. (2001). *Technology Facilitation Standards*. Retrieved from https://www.iste.org/docs/pdfs/2001-technology-facilitation-standards-doc.pdf?sfvrsn=2

International Society for Technology in Education [ISTE]. (2008). *National educational technology standards for teachers*. Retrieved from http://www.iste.org/docs/pdfs/20-14_ISTE_Standards-T_PDF.pdf

Motivation Toward Science and Technology Course. *University Journal of Education, 28*(3), 206-218.

Keengwe, J., Schnellert, G. L., & Kungu, K. (Eds.). (2014). *Cross-cultural Online Learning in Higher Education and Corporate Training*. IGI Global.

Kena, G., Aud, S., Johnson, F., Wang, X., Zhang, J., Rathbun, A., ... & Kristapovich, P. (2014).

The condition of education 2014 (NCES 2014-083). US Department of Education. *National Center for Education Statistics*. Washington, DC. Retrieved from *http://nces. ed. gov/pubsearch*.

Khan, S. A., & Ahmad, R. N. (2014). Evaluation of the effectiveness of cooperative learning method versus traditional learning method on the reading comprehension of the students. *Journal Of Research &*

Reflections In Education (JRRE), 8(1), 55-64.
Koehler, M. J., Mishra, P., & Cain, W. (2013). What Is Technological Pedagogical Content Knowledge (TPACK)?. *Journal of Education, 193*(3), 13-19.
Lee, S. W. Y., & Tsai, C. C. (2011). Students' perceptions of collaboration, self-regulated learning, and information seeking in the context of Internet-based learning and traditional learning. *Computers in human behavior, 27*(2), 905-914.
Liao, Y. K. C. (2011). Game-based learning verse traditional instruction on student affective outcomes in Taiwan: A meta-analysis. *Journal of Information Technology and Applications, 5*(1).
Maryland Online [MOL]. (2014). *Certificate for Online Adjunct Teaching (COAT): Course Competencies.* Retrieved from http://marylandonline.org/coat/documents/COAT_Course_Competencies.pdf
McInnerney, J. M., & Roberts, T. S. (2004). Collaborative or cooperative learning. in Roberts, T. S. (Ed.), *Online collaborative learning: Theory and practice*, (pp. 203-214). Hershey PA: Information Science Pub.
Means, B., Toyama, Y., Murphy, R. & Baki, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record, 115*(3), 1- 47.
Moazami, F., Bahrampour, E., Azar, M. R., Jahedi, F., & Moattari, M. (2014). Comparing two methods of education (virtual versus traditional) on learning of Iranian dental students: a post-test only design study. *BMC Medical Education, 14*(45). doi:10.1186/1472-6920-14- 45
Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). E-Learning, online learning, and distance learning environments: Are they the same?. *The Internet and Higher Education, 14*(2), 129-135.
Moore, M. G., & Kearsley, G. (2011). *Distance education: A systems view of online learning*. Cengage Learning.
Mughal, F., Parsloe, A., Stores, R., Clark, J., Ryan, A., Lee, H., & Barton, C. (2014). From traditional to modern: easing students transition to problem-based learning. *Medical education online*, 19. doi: http://dx.doi.org/10.3402/meo.v19.25438
Muniasamy, V., Ejalani, I. M., & Anandhavalli. (2014). Moving towards virtual learning clouds from traditional learning: higher educational systems in India. I*nternational Journal of Emerging Technologies in Learning (iJET), 9*(9).
Munoz Carril, P. C., Gonzalez Sanmamed, M., & Hernandez Selles, N. (2013). Pedagogical roles and competencies of university teachers practicing in the elearning environment. *The International Review of Research in Open and Distance Learning, 14*(3), 462-487.
Newby, J., Eagleson, L., & Pfander, J. (2014). Quality Matters: New Roles for Librarians Using Standards for Online Course Design, Journal of Library & Information Services in
Distance Learning, 8:1-2, 32-44, DOI: 10.1080/1533290X.2014.916245
Palloff, R. M., & Pratt, K. (2011). *The excellent online instructor: Strategies for professional development.* San Franscisco: Jossy Bass.
Palloff, R. M., & Pratt, K. (2013). *Lessons from the virtual classroom: the realities of online teaching*. Oxford: John Wiley & Sons.
Parker, K., Lenhart, A., & Moore, K. (2011). *The Digital Revolution and Higher Education: College Presidents, Public Differ on Value of Online Learning*. Pew Internet & American Life Project. Retrieved from http://files.eric.ed.gov/fulltext/ED524306.pdf
Paulson, K. (2002). FIPSE: Thirty Years of Learning Anytime and Anywhere. *Change, 34*(5), pp. 36-41. doi: 10.1080/00091383.2002.10544034
Pourshanazari, A. A., Roohbakhsh, A., Khazaei, M., & Tajadini, H. (2013). Comparing the long- term retention of a physiology course for medical students with the traditional and problem-based learning. *Advances in Health Sciences Education: Theory and Practice, 18*(1), 91-97. doi:10.1007/s10459-012-9357-0
Reuben, R. (2008). *The use of social media in higher education for marketing and communications: A guide for professionals in higher education*. Retrieved from California State University, Fullerton, Technology Services for Students Affairs website: http://www.fullerton.edu/technologyservices/_resources/pdfs/social-media-in-higher-education.pdf
Ronimus, M., Kujala, J., Tolvanen, A., & Lyytinen, H. (2014). Children's engagement during digital game-based learning of reading: The effects of time, rewards, and challenge. *Computers & Education*, 71, 237-246.
Rudestam, K. E., & Schoenholtz-Read, J. (2010). *Handbook of online learning*. Thousand Oaks, Calif. : SAGE Publications, 2010.
Salmon, G. (2003). *E-moderating: The key to teaching and learning online*. Psychology Press. Savery, J. R. (2005). BE VOCAL: Characteristics of successful online instructors. *Journal of*
Interactive Online Learning, 4(2), 141-152.
Scobey, D. (2012). A Copernican Moment: On the Revolutions in Higher Education. In D. W. Harward (Eds.), *Transforming Undergraduate Education: Theory at Compels and Practices That Succeed* (pp. 37-50). Lanham: Row man.
Siemens, G., & Matheos, K. (2012). Systemic changes in higher education. *In education, 16*(1), 3-18.

Smith, R. (2008). *Virtual voices: Online teachers' perceptions of online teaching standards and competencies* (Doctoral dissertation). Retrieved from Proquest Dissertations and Theses. (3313841)

Staley, D. J., & Trinkle, D. A. (2011). The changing landscape of higher education. *Educause Review*, *46*(1), 16-33. Retrieved from https://net.educause.edu/ir/library/pdf/ERM1110.pdf

Stefanou, C., Stolk, J. D., Prince, M., Chen, J. C., & Lord, S. M. (2013). Self-regulation and autonomy in problem-and project-based learning environments. *Active Learning in Higher Education, 14*(2), 109-122. doi:10.1177/1469787413481132

Targamadzė, A., & Petrauskienė, R. (2010). Impact of information technologies on modern learning. *Information Technology and Control*, *39*(3), 169-175.

Trapp, A. (2012). The context of learning in UK Higher Education. In Groccia, J. E. (Eds.), *Handbook of college and university teaching: A global perspective*. Sage Publications.

Teaching Critical Thinking Skills: Literature Review

Nada J. Alsaleh
Assistant Professor at the Instructional Technology Department, School of Education - King Saud University, Riyadh, Saudi Arabia
nsaleh@ksu.edu.sa, nsaleh@ict_nada

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ABSTRACT
Critical Thinking (CT) has been recognized as one of the most important thinking skills and one of the most important indicators of student learning quality. In order to develop successful critical thinkers, CT must be incorporated into the curriculum content and teaching approaches and sequenced at all grade levels. This research provides a systematic review of the extant literature on teaching CT skills. The comprehensive review led to the building of a conceptual framework that discusses the four main debates among the researchers engaged in the field of teaching CT. One of these debates; can technology promote students CT skills? Overall, the study of actual practices indicates that teaching approaches tend to focus on subject content rather than CT development. The results indicate a gap in teaching CT skills in terms of innovative methods and particularly in the use of new technologies. They also highlight the need for further research that investigates new approaches for teaching CT skills.

KEYWORDS: Critical thinking skills, teaching critical thinking, assisting critical thinking, technology to promote critical thinking.

INTRODUCTION

Although the importance of Critical Thinking (CT) skills in the learning process is agreed upon, there is less agreement about how CT is defined (Alfadhli 2008). The first serious discussions and analyses of CT were conducted by John Dewey (1916, cited in Kuhn 1999), who discussed the concept of CT skills in education. Dewey perceived CT as a process that begins with a problem and ends with a solution and self-interpretation. Bean (2011, p. 3) elaborates on this point by stating that such a problem should 'evoke students' natural curiosity and stimulate both learning and critical thought'.

Many researchers agree with Dewey's point of view that CT begins with students' engagement with a problem. For example, Kurfiss (1988, p. 2) defined CT as 'an investigation whose purpose is to explore a situation, phenomenon, question, or problem to arrive at a hypothesis or conclusion about it that integrates all available information and that can therefore be convincingly justified'. Moreover, Pithers and Soden (2000, p. 238) state that 'Critical thinking involves being able to identify questions worth pursuing, being able to pursue one's questions through self-directed search and interrogation of knowledge, a sense that knowledge is contestable and being able to present evidence to support one's arguments'. This suggests that CT can be defined as an individual thought process that begins with the intent to solve a problem or to answer a question, by examining different options and choosing the most suitable and logical one.

From a cognitive psychologist's view, Halpren (1997, p. 4) emphasises that CT is the 'use of those cognitive skills or strategies that increase the probability of a desirable outcome. It is used to describe thinking that is purposeful, reasoned and goal directed'. Halpren (1997, p. 4) states, 'Critical thinking is purposeful, reasoned, and goal-directed. It is the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions. Critical thinkers use these skills appropriately, without prompting, and usually with conscious intent, in a variety of settings'. In other words, when people think critically, they evaluate the outcomes of their thought processes, calculate how good a decision is, or identify how effectively a problem has been solved.

Furthermore, Paul (1992, p. 1) states that CT is 'the intellectually disciplined process of actively and skilfully conceptualizing, applying, analysing, synthesising, and/or evaluating information gathered from, or generated by observation, experience, reflection, reasoning, or communication as a rubric to belief and action'. Paul and Elder (2006, p. 4) expand on this point of view by defining CT as 'the art of analysing and evaluating thinking with a

view to improve it'. These definitions indicate that CT is the ability to apply cognitive skills, such as analysing, applying, and evaluating when thinking.

Based on the above review of CT definitions, it is important to note that no single definition of CT is applicable to every discipline at every level. Although researchers generally agree that CT is a high-level thinking skill, teachers' experiences and goals, as well as students' needs, determine the specific skills to be developed (Condon & Kelly-Riley 2004).

This study provides a systematic review of the literature on teaching CT skills focusing on published articles in academic journals as well as dissertations in this field. The rest of the article is organised as follows: First, the method used to identify and select studies for inclusion in this review is described. The article then presents the conceptual framework of the study and discusses the literature considering the four main debates among researchers in the field of teaching CT. Finally, the limitations of existing studies on teaching CT skills are listed and the suggestions for further studies.

METHOD

A systematic literature review was conducted, which focused on describing and discussing the topic from theoretical and conceptual viewpoints. This study followed the British Educational Research Association's guidelines for conducting a systematic review (Cohen, Manion, & Morrison 2011). First, an initial search for appropriate sources was conducted using Google Scholar and electronic databases from several academic fields such as education and psychology to identify CT-related articles. A variety of search terms were used including different variations and combinations of the following terms: 'critical thinking skills', 'teaching critical thinking skills', 'high-level thinking skills', 'innovative way to teach critical thinking skills', and 'critical thinking cross curriculum'. Second, the abstracts were read to screen the initial list of articles for the five main topics (teaching CT skills, assessing CT skills, strategies to teach CT skills, CT skills taxonomy, and using technology to teach CT skills). Later, these five topics were used to form the base of the conceptual framework of the present study. Third, a conceptual framework was designed, which summarised the main arguments among the researchers in this field, as will explained later. A systematic search focusing primarily on peer-reviewed theoretical and empirical studies on teaching students CT skills was conducted via different databases, including Education Full Text, Education Resources Information Center (ERIC), JISTR, and the Web of Science. The review included articles or reports from well-established research organizations. It also included dissertations that studied and examined this topic. Finally, a comprehensive review was conducted in terms of the conceptual framework of the research.

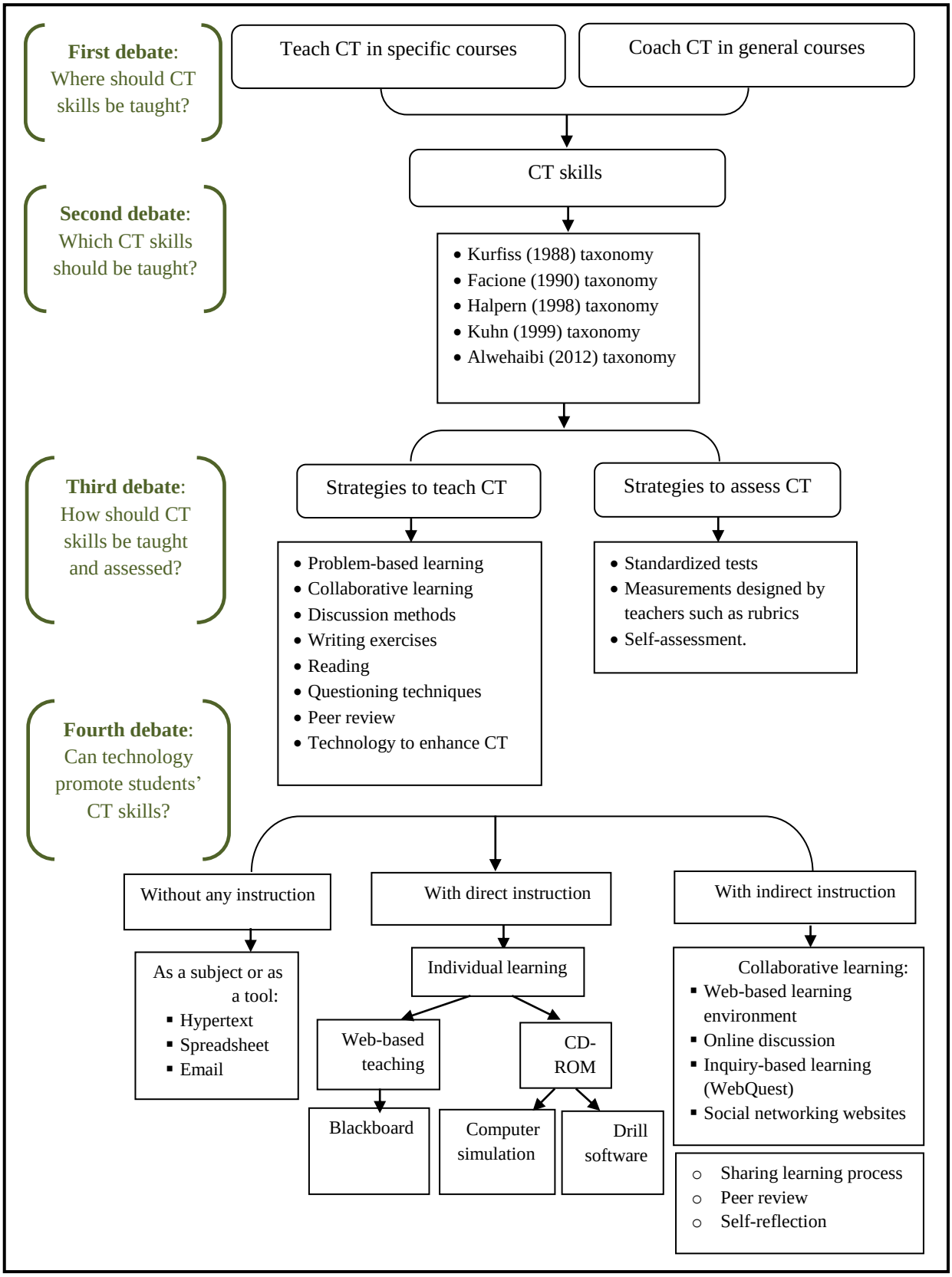
RESULT AND DISCUSSION

The review indicated that most researchers agreed that CT refers to the use of cognitive skills or strategies, and that through teaching and coaching, students can master CT (Fisher 1998; Halpern 1999; Pithers & Soden 2000). Gelder (2005) explained that CT skills can be taught in the same way that other cognitive skills are taught. He claimed that knowing the theory of CT and its related concepts, practising these skills in real situations, and then transferring these CT skills to different situations made students critical thinkers. Researchers appeared to be in agreement (Facione 1990; Halpren 1999; Kuhn 1999; Pithers & Soden 2000; Fuiks & Clark 2002) about the ability to teach and learn CT skills; however, some of them disagreed about several issues related to teaching and learning CT skills:

1. Where should CT skills be taught?
2. What CT skills should be taught?
3. How should CT skills be taught and assessed?
4. Can technology promote students' CT skills?

In order to organise the ideas and achieve the research purposes, a conceptual framework that included the main four debates in the area of teaching CT was used. According to Miles, Huberman, and Salana (2014), a conceptual framework is an analytical tool with several variations and contexts. It is used to create conceptual distinctions and organise ideas. Figure 1 presents the conceptual framework of the research and shows the four main debates among researchers in the field of teaching CT.

Figure 1: The Conceptual Framework of the Study



First Debate: Where Should CT Skills be Taught?

Researches disagreed about where CT skills should be taught: whether CT should be taught in specific courses on CT skills (CT as an isolated set of skills), or in general courses (as part of other subjects) (Perkins & Salomon 1989). This section elaborates upon this debate.

Teach CT in specific courses

CT skills can be taught in a specific course that focuses on CT theories, skills, and practices. Supporters of teaching CT as a specific set of skills suggest that it should be taught as a dedicated programme that aims to impart to students the CT theoretical framework, concepts, and skills. For example, Gelder (2005) claimed that promoting students' CT begins by teaching them the basic elements. Students must understand the theory of CT, the related vocabulary, and specific skills. Williams and Worth (2001) investigated the difference in the effectiveness of teaching CT skills in specific courses compared with incorporating CT skills into general courses that were not related directly to teach CT skills. They found that whereas the former offered some promise in promoting CT, the latter produced only marginal improvements in CT.

The results of several studies support the idea that the best method to enhance CT is to teach its theoretical background. For example, Alwehaibi (2012) investigated the effects of a dedicated CT programme during a five-week intervention with 40 female undergraduate students in the English Department at Princess Noura Bint Abdulrahman University in Saudi Arabia. She found that the CT programme had a significantly positive effect on the students' CT skills. This result was consistent with the findings of Bensley, Crowe, Bernhardt, Buckner, and Allman (2010) pertaining to 47 psychology students who were tested at a small, mid-Atlantic public university. In their study, they compared the CT skills of the 47 students after dividing them into two groups. The first group received instruction in CT skills during their course (they studied a methodological course on statistics that was supplemented with a CT textbook). The second group received instruction on learning statistics, research design and methodology, as well as on how to write an American Psychological Association (APA)-style research report, but they did not receive explicit instructions in CT skills. The group that received instruction in CT skills demonstrated a significantly greater increase in their argument analysis skills compared with the other group. These results support the researchers' views that CT skills should be taught similar to any other cognitive skill, explicitly rather than as a separate course.

Kuek (2010) also supported teaching CT skills through dedicated courses. He experimented with a 12-week intervention for two groups of university students in Sudan. The first group was taught reasoning and CT skills to enhance their argumentative writing abilities. The other group studied the same course (reasoning), but without the dedicated CT theory and skills component. He found significant differences between both groups. In the first group, students' CT, reasoning, and argumentative writing skills improved radically after the intervention. Moreover, students' attitudes towards thinking skills improved.

Although existing studies provide evidence indicating the effectiveness of formally teaching CT, this strategy might not be appropriate for all educational systems. For instance, in Saudi Arabia, all university programmes do not offer CT components, because of which some students graduate without being provided an opportunity to study CT; such students may lack CT skills as a consequence. Dedicated courses also rely heavily on the teachers themselves and their experiences (Alwehaibi 2012), which affects the final output and the extent to which the aims of individual courses are achieved.

Coach CT in general courses

Unlike the previous approach, Hatcher (2006) claimed that CT skills must be a main part of any course and that students should practise these skills in depth. In his study, he argued that an integrated approach to teaching CT would achieve significantly better outcomes than teaching CT as a stand-alone course. Moreover, he stated that one of the beneficial consequences of this approach is that it becomes possible for teachers from a variety of disciplines to provide the needed instruction in CT skills as part of their normally taught courses, instead of relying on select teachers to teach the skills in stand-alone courses.

Supporters of including coaching CT skills as part of each course believe that it is a mistake to concentrate on theory instead of practice. Perkins and Salomon (1989) claimed that the mistakes teachers usually make stem from their belief that skills follow naturally as a consequence of knowing the theory. Gelder (2005) argued that learning about CT is not adequate; it is not adequate to teach students a course on CT theory and assume that such students will turn out to be better critical thinkers. Students need to practise these skills in different contexts.

Halpern (1999) noted that after 25 years of work on CT theory and pedagogy, teaching students a set of thinking skills did not appear to be sufficient for them to master CT skills. Students should have the opportunity to practise CT skills in different contexts and in different situations in order to gain a more comprehensive understanding of the theory and application. Kuhn (1999) argued that if teachers want their students to master these skills, they should help them learn how to apply the knowledge and theories in different situations. This suggests that CT skills should be a goal for each course.

Hager, Sleet, Logan, and Hooper (2003) provided an example of how to coach undergraduate students CT skills through science courses. They designed and evaluated tasks related to applications of chemistry and physics in everyday life with the goal of fostering CT skills in first-year students at an Australian university. Students were required to complete tasks in co-operative groups and to interact in these groups in ways that would fostering some CT skills such as analysing arguments, asking and answering questions for clarification, defining terms, and judging the credibility of a source. Evidence obtained from students' discussion platforms, questionnaires, and teachers' observations indicated that many students considered that their thinking skills, and particularly some CT skills, were enhanced by the experience of attempting the tasks in small co-operative groups.

MacKnight (2000) argued that teachers could engage their students in a wide range of activities in order to contribute to intellectual growth generally, and CT specifically. He confirmed that CT affected all forms of communication – speaking, listening, reading, and writing – and could therefore be practised daily in every interaction. It should not be considered a separate activity from problem solving, creativity, inquiry, or collaborative learning.

Paul and Elder (2006) argued that all courses should be designed to help students think within a discipline, and that the only way to learn any discipline is to learn to think critically within that discipline. They indicated that students need to see that there is an ordered and predictable set of relationships for all subjects and disciplines. Every subject generates purposes, raises questions, uses information and concepts, makes inferences and assumptions, generates implications, and embodies a point of view.

Duron, Limbach, and Waugh (2006) claimed that all disciplines need to design and manage courses in a manner that ensures that students effectively move toward CT. They suggested a five-step framework based on existing theory and best practices in cognitive development, effective learning environments, and outcomes-based assessments. They argued that this model could be implemented in any course and will encourage students to engage in CT. This model consists of the following steps: 1. determine learning objectives; 2. teach through questioning; 3. practise before you assess; 4. review, refine, and improve; and 5. provide feedback and assess learning. Thus, implementing CT through this framework clearly requires a commitment to active, student-centred learning. Furthermore, teachers should provide thoughtful consideration to current instructional methods and the personal beliefs that drive them prior to contemplating this particular approach to teaching.

Halpern (1997) suggested a model consisting of four components to guide teaching and learning for CT: 1. a dispositional component to prepare learners for effortful cognitive work; 2. instruction in CT skills; 3. training in the structural aspects of problems and arguments to promote trans-contextual transfers of CT skills; and 4. a metacognitive component that includes checking for accuracy and monitoring progress towards the goal. Previous models indicated that teachers from any context could modulate their context on these models in order to enhance students' CT.

Summarising, the methods used to teach CT skills aimed to teach specific courses about CT theory and skills, or alternatively, to coach students on CT skills as part of any course by providing students with different learning activities or teaching strategies aimed at promoting students' CT skills. Every approach has its own strengths and weaknesses. For example, the first option focuses on the importance of learning the theory before practice but is limited to some courses and subjects. On the other hand, coaching students on CT skills in every course they study ensures that students graduate with at least a minimum amount of CT skills. However, this approach requires special skills from teachers and a stimulating environment.

Second Debate: Which CT Skills Should be Taught?

Although there is consensus that CT is a human cognitive process that enables one to use a specific set of cognitive skills, significant controversy surrounds the skills that should be taught to develop such thinking (Alwehaibi 2012). Because of the multiple definitions of CT, researchers/teachers disagree about the skills that make a person a critical thinker. This section presents some taxonomies on CT skills.

Many authors have attempted to determine and classify the most important CT skills. Taylor (2002, p.12), for example, described CT skills as 'the ability to clearly communicate one's reasons for one's judgments'. Furthermore, he posited that critical thinkers usually commit to their own position and simultaneously have the ability to change their position if they face convincing evidence otherwise.

Giancarlo and Facione (2001) stated that CT has conceptual connections with reflective judgement, problem framing, higher-order thinking, logical thinking, decision making, problem solving, and use of the scientific method. Moreover, Swartz and Parks (1994) listed thinking capably and carefully about causal explanations, predictions, generalizations, reasoning, and the reliability of sources as major CT skills.

Paul and Elder (2006) assumed that CT is the ability to read, write, speak, and listen effectively. It enables people to impart meaning to events and patterns of events, as well as to assess the reasoning of others. They state that if students want be critical thinkers, they should be able to master systems, become more self-insightful, analyse and assess ideas more effectively, and achieve more control over their learning, their values, and their lives. In other words, CT is a broad set of skills and characteristics that sustain and define lifelong learning.

Teaching CT skills and coaching them requires a careful review of the underlying theory and related taxonomies. The literature on CT provides several taxonomies of CT skills. For example, Kuhn (1999) categorised CT skills as metacognitive, meta-strategic, and epistemological. Metacognitive skills refer to people in control of their own beliefs in the sense of exercising conscious control over their evolution in the face of external influences. They know what they think and can justify why. Their skills in the conscious coordination of theory and evidence also places them in a position to evaluate the assertions of others.

As Kuhn (1999) stated, people who have developed strong meta-strategic skills apply consistent standards of evaluation across time and situations. They do not succumb to a view of a favoured assertion as more probable than its alternatives because of its favoured status, and therefore, subject it to different standards of evaluation. They also resist the offer of local interpretation.

Finally, according to Kuhn (1999), epistemological understanding is the most fundamental underpinning of CT, as it helps people see the point of thinking in order to engage in it. If knowledge is entirely objective, unconnected to the human minds that do this knowing, or alternatively, if knowledge is entirely subjective to the tastes and wishes of the knower, then critical thinking and judgement are superfluous.

Another taxonomy is Dick's taxonomy (1991). Dick reviewed research in the area of CT for the last 40 years and indicated that CT consisted of identifying and analysing arguments, of considering external influences on arguing, of scientific analytic reasoning, and of logical reasoning. Dick (1991) suggested the following taxonomy for CT:

1- Identify arguments: This includes themes, conclusion, reasons, and organization.
2- Analyse arguments: This includes assumptions, vagueness, and omissions.
3- Consider external influences: This includes value, authority, and emotional language.
4- Scientific analytic reasoning: This includes causality and statistical reasoning.
5- Reasoning and logic: this includes analogy, deduction, and induction.

In addition, Halpern (1997) proposed a taxonomy of CT skills as a guide for instruction, which consists of the five main skills listed below:

> (a) Verbal reasoning skills: This category includes those skills needed to comprehend and defend against the persuasive techniques that are embedded in everyday language.
> (b) Argument analysis skills: An argument is a set of statements with at least one conclusion and one reason that supports the conclusion.
> (c) Skills in thinking as hypothesis testing: The rationale for this category is that people function similar to intuitive scientists who explain, predict, and control events.
> (d) Likelihood and uncertainty: Because very few events in life can be known with certainty, the correct use of cumulative, exclusive, and contingent probabilities should play a critical role in almost every decision.
> (e) Decision-making and problem-solving skills: In some sense, all CT skills are used to make decisions and solve problems, but the ones that are included here involve generating and selecting alternatives and judging among them. Creative thinking is subsumed under this category because of its importance in generating alternatives and restating problems and goals (p. 452).

Alwehaibi (2012) focused on the development of five particular skills: causal explanations, determining the reliability of sources, arguments, predictions, and determining part-whole relationships. She asserted that this selection is based on their suitability in terms of the academic level of the students she studied and the importance of CT skills for students' learning and daily lives.

The consensus reached by the researchers and teachers, who participated in the American Philosophical Association's Delphi project on the definition of CT, is that the characteristics of a critical thinker include traits such as being inquisitive, fair-minded, flexible, diligent, and focused on enquiry (Facione 1990). In Facione's taxonomy (1990, p.12), CT is composed of six main skills, each containing sub-skills, as indicated below:

1. Interpretation

- Categorisation
- Decoding significance
- Clarifying meaning

2. Analysis
    - Examining ideas
    - Identifying arguments
    - Analysing arguments
3. Evaluation
    - Assessing claims
    - Assessing arguments
4. Inference
    - Querying evidence.
    - Conjecturing alternatives
    - Drawing conclusions
5. Explanation
    - Stating results
    - Justifying procedures
    - Presenting arguments
6. Self-regulation
    - Self-examination
    - Self-correction

Facione (1990) asserts that CT is focused self-judgement that results in interpretation, analysis, evaluation, and inference, as well as an explanation of the evidential, conceptual, methodological, or contextual thoughts upon which such judgement is based.

Third Debate: How Should CT skills be Taught and Assessed?
The review of literature indicates general agreement that CT includes a range of mental processes and skills such as interpretation, analysis, evaluation, inference, explanation, and self-regulation. Nevertheless, it is important for the teacher to decide how to teach and assess these skills. In fact, using strategies to teach and measure the improvement of CT skills is extremely complex and diverse.

Strategies to teach CT skills
Given the different taxonomies of CT skills, the appropriate strategies for teaching CT skills remain to be identified. Different studies have discussed the effectiveness of using specific strategies to enhance CT skills, such as class discussions, problem-based learning, collaborative learning, discussion methods, questioning techniques, and evidence-based projects (Kuhn 1999).

In order to teach CT skills and enable students to master them, teachers should choose a strategy that encourages students to understand and apply such skills. Lawrence et al. (2008) examined teachers and students' views to determine activities from which CT skills best emerged. They found that both teachers and students thought that critiquing journal articles, engaging in debates, writing research papers, evaluating case studies, and discussing questions helped them practise CT skills. This can be accomplished by teachers asking students to critique a journal article in a way that teaches them CT skills, such as asking them to look at multiple perspectives, question those perspectives, observe if they have sufficient evidence/research to back up their claims, and/or assess if the author of the journal is biased (e.g. is the article written in a way that favours only one side).

Questioning techniques, in addition, play an important role in inducing students' higher-level thinking skills, such as self-reflection, revision, and social debate, all of which are essential for CT. Socratic questioning is one of the most popular and powerful teaching approaches that can be used to guide students in generating thoughtful questions, thereby fostering their CT skills (Yang, Newby, & Bill 2005). Yang et al. (2005) investigated the effects of using Socratic questioning to enhance students' CT skills in an asynchronous discussion. They conducted the experiment for 2 consecutive 16-week semesters with 16 veterinary undergraduate students at a Midwestern university in the United States.

The results of their study indicated that, with appropriate course design and instructional interventions, CT skills can be refined and maintained using Socratic questioning techniques (Yang et al., 2005). This may be because this questioning technique provides students the time needed for thoughtful analysis, composition, negotiation,

and reflection, as their discussion of an issue evolves and allows instructors to model, foster, and evaluate the CT skills exhibited during the discussion.

Pithers and Soden (2000) supported the questioning technique as a strategy to enhance CT and indicated other approaches that, according to their review of literature, brought about changes in students' thinking. The most important of these involves students consciously reflecting on their main ideas and being encouraged to analyse these ideas. Students, for example, can be assisted in analysing their ideas by the teacher asking about similarities, assumptions, and alternatives; by questioning prior assumptions; by using classifications; and by deciding what data or information supports the idea.

Furthermore, Hansen and Salemi (2012, p.98) made a strong case for using class discussions to develop higher-order cognitive skills. They noted that 'in the course of discussion, students aim at producing their own answers and interpretations and at understanding and evaluating the interpretations and opinions of their colleague'. The dynamics and continued nature of an effective discussion allow for a flow of ideas and development of the thinking of all participants. They suggested five steps to design a successful class discussion: '1. Defining the goals of the course; 2. Choosing materials; 3. Preparing sets of questions to guide the discussion itself; 4. Planning the mechanics of the discussion itself; and 5. Defining the responsibilities and evaluating the performance of discussion leaders' (Hansen & Salemi 2012, p.41).

Taylor (2002) also believed that classroom discussions played a role in fostering CT skills, as a classroom discussion about course content could teach students what to do with the content and provide them an opportunity to practise forming their own judgements in an environment that was safe, supportive, and instructive. Taylor (2002) elaborated by stating that teachers' roles are very important in the classroom as they can lead discussions to help students think critically. The role of the teacher is to arrange conversations by: 1. Deciding what kind of conversation to begin the class with; 2. Being aware of the type of conversation that is occurring at any given point; and 3. Asking the right kinds of questions to initiate the type of conversation the teachers wishes for.

There is another, more specific, idea that teachers can adopt that is likely to enhance CT: a reading strategy, specifically reading between the lines, and attempting to understand hidden messages and arguments. To illustrate this, Pithers and Soden (2000) state that students might be asked to read a brief article that makes certain claims and then be tasked with suggesting ways of investigating the validity of these claims, implementing their suggestions, and finally reaching a conclusion about the validity of the article.

Moreover, writing activities have been used as a strategy in the field of enhancing CT for a long time. Condon and Kelly-Riley (2004, p.66) assert that 'writing acts as a vehicle for critical thinking, but writing is not itself critical thinking'. Cohen and Spencer (1993) provide an explicit model for using writing to teach CT. They note that the writing process provides an essential structure via which students can generate ideas and clarify their thinking about the relationship between those ideas. They further assert that writing can be an effective tool for teaching students a key element in CT: how to develop persuasive arguments supported by logic and evidence.
In a review of literature that sought to clarify the relationships between writing and CT, Bean (2011) provided guidelines on writing activities to promote CT skills. He emphasised writing assignments as one of the most flexible and effective ways to integrate CT activities into a course because the writing process itself involves complex CT skills. He claim that writing activities that aim to promote CT should shift their focus from topic-centred assignments to problem-centred assignments that are primarily argumentative or analytical.

Similarly, Quitadamo and Kurtz (2007) studied the efficiency of a writing strategy on students' CT. The participants included 310 non-major undergraduates who were taking biology to fulfil their general education science requirement at a state-funded university in the Pacific Northwest. In the study, they compared the CT performance of students who had undertaken a laboratory writing exercise with those who had undertaken a traditional quiz-based laboratory exercise in a general education biology course. The effect of writing on CT performance was investigated using the California Critical Thinking Skills Test (CCTST). The results of their study indicated significant differences between the writing and non-writing groups. Though modest, the strength of the relationship between the writing/non-writing groups and their CT performance was significant, accounting for more than 6% of the variance in CT performance. Specifically, analysis and inference skills increased significantly in the writing group but not in the non-writing group. Writing students also exhibited greater gains in evaluation skills; however, these were not significant. In brief, previous reviews have indicated that writing is a useful strategy that can be used to enhance CT skills.

Pithers and Soden (2000) suggested problem-based learning (PBL) as another promising strategy for developing CT. Well-designed problem-based courses are likely to encourage students to think critically about content since the courses begin with problems rather than with the content of the lectures and tutorials aimed at teaching students a body of knowledge. For example, students are required to understand and analyse the main issues within the problems, suggest a plan that might help resolve the problem, evaluate the proposed resolution, and decide on the final solution.

Questioning techniques, reading, writing and PBL approaches are very similar to general academic study skills. Some researchers have argued that there is an overlap between CT skills and other study skills, such as detecting fallacies, becoming familiar with one's audience, critical reading strategies, and writing skills (Stapleton 2001; Bean 2011). They have asserted the importance of recognising the differences between these skills. Where CT is a thinking process, study skills are strategies to practise and reflect CT skills (Bean 2011). To illustrate this, Bean (2011, p.4) provided the example that 'writing is the process of doing critical thinking and a product that communicates the results of critical thinking'.

A review of CT teaching strategies reveals that various methods and activities that can be used to enhance students CT skills. Therefore, the present study summarises some suggestions that might assist teachers in choosing and applying the most suitable strategy. First, Moseley et al. (2005) suggested a framework encompassing understanding, thinking, and learning. According to Moseley et al. (2005), CT skills can be promoted through the use of several simultaneous strategies, such as using reading and writing approaches. They proposed that engaging students in focused writing activities, which begin with different reading strategies and follow the argumentative and persuasive writing style, would improve their CT skills.

Second, Karns (2005) asserted the importance of providing strategies and activities that fit the students' preferences and perceptions. To provide evidence, he conducted a study to investigate students' perceptions of learning activities using survey responses from 227 students at 8 universities in the United States. He examined students' preferences and the effectiveness of some learning activities and found that according to students, internships, class discussion, and case analyses were the learning activities that contributed the most to their learning. Therefore, he claimed that responding to students' preferences through the use of these strategies helps promote student learning.

Finally, Edman (2002) argued that given the various teaching CT strategies, the strategy should be well designed regardless of which strategy is used. The design process needs to be based on a set of models, theories, and a revision of the course aims and components of CT that the designers want to enhance. It should also be designed based on students' contexts and backgrounds.

Strategies to assess CT

An initial overview seems to indicate overlap and confusion between CT teaching strategies and assessment strategies, as many people find them to be the same; however, there are differences between them. For example, if students are asked to write essays to promote their CT skills and are encouraged to use higher-level thinking skills, such as analysis and evaluation, the submission of these essays does not mean that the students have mastered CT skills. Teachers need an instrument to assess these essays and make decisions about them. This holds true for classroom discussions as well; even if students participate in classroom discussions, their participation does not necessarily indicate the presence of CT skills.

The effective assessment of students' CT skills is a major issue for higher education. The issue here is whether teachers, during the process of a CT assessment, can reliably assess the level of a student's CT (Quitadamo & Kurtz 2007). In fact, assessment remains a major concern in developing instructional activities to enhance students' CT skills (ibid).

Different approaches are used to assess CT skills (Ennis 1993; Andrade 2000; Paul & Elder 2006), and it is important for teachers who seek to enhance these skills to determine at an earlier stage the type of approach they will use and the reason for doing so. As Alfadhli (2008) stated, the following three main approaches can be used to assess CT, and teachers can use any of them based on their goals: 1. commercially available, general knowledge standardised tests; 2. researcher or teacher-designed assessments that attempt to capture aspects of CT more directly related to the purposes of the research project or subject of instruction, such as rubrics; and 3. teaching students to assess their own thinking. This allows the teacher to build his/her own assessments to fit within the course goals, students' needs, and the teacher's aims. The choice between these approaches will depend on the course's goal and aims, students' needs and abilities, and the ability and availability of the teacher.

CT standardised tests are one of the most popular tools used to assess CT, and they have been examined and explained in several studies (Ennis 1993). For example, CCTST is a famous instrument in this field that measures cognitive and meta-cognitive skills associated with CT. It is based on an agreed definition of CT and has been evaluated for validity and reliability for measuring CT at the college level for four years (Facione 1990). The CCTST measures the cognitive skills indicated by a Delphi panel of experts on the component skills of critical thinking (analysis, inference, evaluation, induction, and deduction) (Quitadamo & Kurtz 2007).

Another well-known measurement is the WSU Guide to Rating CT, which was developed by Washington State University (WSU). The earlier version of this instrument was first developed in 1997 and was used to evaluate students' CT based on their writing abilities. Later, this instrument was improved to be adapted by teachers to suit their instructional and evaluative methodologies, and to be employed across the curriculum to evaluate students' CT outcomes (Condon & Kelly-Riley 2004).

The rating procedures that are used in the WSU guide ensure that faculty provide ratings in a thoughtful and consistent. Using a six-point scale for each dimension, teachers select one of the following levels indicated in Table 1.

Table 1: *WSU Guide Rating Scale*

Scale	1	2	3	4	5	6
Description, etc.: • identification of a problem or issue. • establishment of a clear perspective on the issue.	Not evident; can't find it anywhere in the paper	Discernible, but not developed	Better than 2, but not yet 4. Could be confused, inconsistent	Important to the paper	Better than 4, but not yet 6. May be substantially developed in places, but not throughout the paper	Substantially developed; considered in full complexity; nuanced and sophisticated

Another guide for assessing CT was designed by Condon and Kelly-Riley (2004), and was derived from scholarly work, including that of Facione (1990) and Paul (1992), and local practices and expertise, to develop a process for improvement and a means for measuring students' CT skills throughout their college period. The guide can be adapted instructionally and can be used as an evaluative tool. It includes seven key areas of CT skills:

1. Identification of a problem or issue;
2. Establishment of a clear perspective on the issue;
3. Recognition of alternative perspectives;
4. Location of the issue within an appropriate context(s);
5. Identification and evaluation of evidence;
6. Recognition of fundamental assumptions, implicit or stated by the representation of an issue;
7. Assessment of implications and potential conclusions (Condon & Kelly-Riley 2004).

According to Condon and Kelly-Riley (2004), teachers are encouraged to use as many of the above seven points within their classrooms, their teaching styles, the makeup of the students in their course, and so on. Moreover, teachers are encouraged to distribute these criteria to students before assignments so that students can develop a clear understanding of expectations.

In terms of collecting and analysing CT tests, Bers (2005) reviewed the most popular CT tests and listed them as follows:

- **Academic Profile:** This examines college-level reading and CT skills in the context of the humanities, social sciences, and natural sciences.
- **College BASE**: This is designed to be administered after students complete a college-level core curriculum. It tests knowledge and skills in English, mathematics, science, and social studies, and provides performance rankings in higher-order thinking skills, such as interpretive, strategic, and adaptive reasoning abilities.
- **Collegiate Learning Assessment Project (CAL)**. In this assessment, the students are assigned open-ended tasks and asked to write essays in response. These are then assessed for students' ability to identify the strengths and limitations of an argument; present a coherent argument in support of a proposition; or interpret, analyse, and synthesise information.

- **Tasks in Critical Thinking:** This test is performance-based and generates group rather than individual scores. Students are asked to solve a dilemma or task in an area of humanities, social sciences, or natural sciences. Teachers use rubrics to evaluate responses, targeting the skills areas of inquiry, analysis, and communication.
- **Test of Everyday Reasoning:** This thirty-five-item multiple-choice test is designed to assess an individual's or group's basic reasoning skills.
- **Watson-Glaser Critical Thinking Appraisal**: This test was developed in the 1960s, and in addition to a total score, it features five sub-scores in inference, recognition of assumption, deduction, interpretation, and evaluation of an argument. This test, similar to all the standardised tests presented thus far, is intended to test students' ability to think critically.

Although some of the previous tests are very common and have been cited numerous times in different research such as CCTST, they might not be appropriate for use in any study in any context. Teachers should have a defensible elaborated definition of CT when selecting a test. Teachers must also have a clear idea of the purpose for which the test is to be used. Moreover, there are some limitations surrounding the use of standardised tests that were indicated by Ennis (1993). Examples are as follows: 1. These tests should be examined twice, as a pre-test and post-test, in order to determine if there is any improvement in CT skills; however, this implementation poses a potential problem of informing the students of the test questions. 2. Most of the CT tests are multiple-choice tests, which are not comprehensive; they lack information that is important in CT. 3. The differences in background, views, and assumptions between teachers and students can sometimes result in different answers to test questions. 4. Results might be expected too quickly; learning to think critically takes a long time.

Other researchers, such as Ennis (1993), Quitadamo and Kurtz (2007), and AlFadhli (2008), suggested different methods to assess students' CT skills and to circumvent the limitations of standardised tests; teachers can design their own scale to measure CT skills, which fit within the research aims and goals. Rubrics are one of the most common tools used to assess students' CT. A considerable number of example rubrics are now available as guides (Ennis 1993; Facione & Facione 1994; Andrade 2000; Mansilla, Duraisingh, Wolfe, & Haynes 2009). In order to design and use a rubric, Peach et al. (2010) asserted that teachers must develop one that captures their learning outcomes in a way they find meaningful. The key is to 'get it down, then get it right' (Peach et al. 2010, p.316). Moreover, teachers must learn that in developing rubrics, they are not likely to be accurate the first time. If teachers understand that assessment is a journey, they will not expect perfection on the first attempt; instead, they will develop a usable rubric understanding that it can be improved over time (ibid).

Facione and Facione (1994) developed a four-level scoring rubric for considering the subject matter or context in which CT skills are applied, called 'Holistic Critical Thinking Scoring Rubric'. It does not enable an institution to compare students' results with national norms, but is based on extensive research on assessing CT. The scoring is on a four-point scale (4: *Strong*; 3: *Acceptable*; 2: *Unacceptable*; 1: *Weak*) and is used to assess the following skills:

- Interprets evidence, statements, graphics, questions, etc.
- Identifies the salient arguments' (reasons and claims) pro and con.
- Analyses and evaluates major alternative points of view.
- Draws warranted, judicious, and non-fallacious conclusions.
- Justifies key results and procedures and explains assumptions and reasons.
- Fair-mindedly follows evidence and reason.

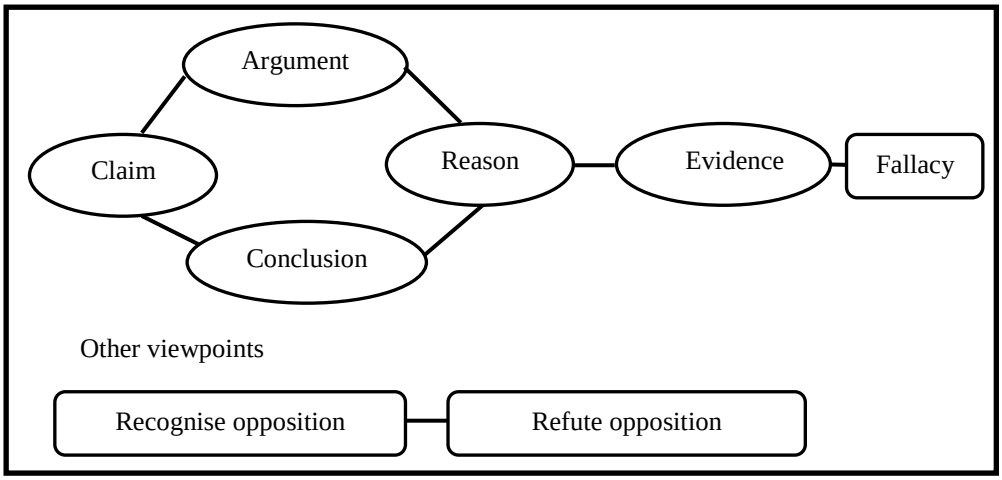
Writing has long been perceived as a tool to assess CT skills (Ennis 1993; Halpren 2001; Hersh 2007; Quitadamo & Kurtz 2007). Condon and Kelly-Riley (2004) stated theirn opinion about using writing as a tool to assess CT:

> 'The best way to learn to think is to read a lot of good writing and write a lot about what you have read. Writing and the communication of ideas are central to all disciplines whether one is in college or the workplace. One of the most important skills in the digital age is, in fact, one of the oldest – writing'. (p.56)

Ennis (1993) suggested that teachers can ask students to write an argumentative essay and then analyse those essays using a CT scale or rubric designed by the teachers based on their requirement. Cottrell (2005) defined argumentative writing as a writing style where the writer persuades readers to accept certain positions or points of view, by supporting the opinions with appropriate reasons and evidence.

Stapleton (2001) proposed a model to assess CT skills that are reflected in argumentative texts. His model was based on a review of the literature, a pilot study, and well-established models for analysing argumentative writing (Toulmin 1958, cited in Crammond 1998). Stapleton (2001, p.44) claimed, "Identification of arguments is based on semantic structures and linguistic elements that typically signal the presence of reasons'. In addition, he said that to investigate the extent and nature of CT skills in writing, the following basic elements should be observed: arguments, claims, reasons, evidence, fallacy, conclusions, recognition of opposite viewpoints, and refuting opposition (Figure 2).

Figure 2: Structure of Argumentative Writing (Stapleton, 2001, p.128)



According to Stapleton (2001), the argumentative structure consists of a statement of belief (claim) supported by reasons that justify the claims made, and those that raise and address counter arguments. Moreover, argumentative writing might contain intermediate conclusions, which can also serve as reasons before the final conclusion is drawn.

In addition, Stapleton's model (2001) includes an assessment scale to assess CT elements, and not just an evaluation of the argumentative writing structure, by identifying and counting the key elements of CT displayed in students' writing, such as the following: (a) the number of arguments; (b) the extent of evidence provided; (c) the recognition of opposing arguments; (d) corresponding refutations; and (e) the number of fallacies. Stapleton's model (2001) offers an educated tool to assess students' argumentative writing and test their CT skills.

Fourth Debate: Can Technology Promote Students' CT skills?

Many researchers have attempted to investigate the role of integrating technology for learning purposes, as well as the use of technology to enhance CT skills. Astleitner (2002) provided a narrative literature review on the effects of collaborative computer-supported environments, computer simulations, and logic software on CT. His findings have been cross-referenced with the literature and are described in the next section.

Using technology without any instruction.

In this approach, the technology itself acts as a tool for solving given tasks without providing any instructional functions about CT concepts and skills (Astleitner 2002). Examples include a teacher's use of a PowerPoint presentation to illustrate the lecture, a student's use of Word software to complete their homework, or the use of e-mail to contact a teacher or other students. In this approach, technology does not offer any instruction or information about CT skills or how to apply them; it merely acts as a tool to facilitate the teaching and learning process.

Scarce (1997) tested this approach by examining the efficiency of using e-mail to exchange assignments and communicate with other students to promote their CT skills. He conducted his study during his 10-week sociology class. Students were asked to read and react to a book selected exclusively for this assignment. He found that using e-mail as a communication tool without any further instructional function did not improve CT when compared with traditional classroom instruction. Moreover, Santos and de Oliveira (1999) found similar non-significant results when using the Internet for content presentation. These findings are consistent with other research findings pertaining to this type of approach (Wilkinson, Bennett, & Oliver 1997; Scarce 1997;

Duffelmeyer 2000). Using technology, such as computer software and Internet websites, without providing any CT skills as a way to enhance CT skills is ineffective and does not improve CT skills.

In contrast, Jonassen, Carr, and Yueh (1998) argued that technology can be used as content (for teaching about technology) and as a tool (for problem solving) to stimulate and support CT. Expanding on this point of view, Hopson et al. (214) noted positive effects from the use of computer tools such as spreadsheets, databases and word processing software in promoting undergraduate students' high-level thinking skills and CT, when they were used to take notes, create assignments, and construct projects. Furthermore, Mandernach (2006) described how using simulation technology provided undergraduates with an opportunity for decision-making, team building, and CT. These differences in research findings may be due to the rapidly changing nature of technology and calls for further research in this area.

Summarising, there is no clear no consensus about the role of technology without any instructional functions on promoting students' CT. However, being critical of Internet websites and having tools such as e-mail does not guarantee CT.

Using technology with direct instruction

In this approach, technology is used to deliver direct instructional functions in different subjects (Astleitner 2002). Examples include the use of a learning management system such as Blackboard to deliver distance learning or logic software, Internet websites, or computer simulations to deliver some teaching functions.

According to Yeh and Strang (1997), computer simulations provide an alternative setting for teachers-in-training to become capable cultivators of critical thinkers. A program called Computer Simulation for Teaching CT was developed to assist teachers and functions on the principle that teachers, through reflective teaching, will improve their professional knowledge and thus develop effective strategies for teaching CT. They found that young teachers were better skilled at teaching CT after using computer simulation modelling daily for classroom problems.

Another study by Gokhale (1996) examined the effectiveness of integrating guided discovery computer simulation into traditional lecture-lab activities to enhance students' higher order thinking skills such as problem solving. The sample included 32 students divided into two sections (control and experimental), enrolled in an electronics course offered in an industrial technology department at a state university in the Midwest (in the United States). The treatment was a computer-based simulation software that enabled students to experiment interactively with the fundamental theories and applications of electronic devices. It provided instant and reliable feedback. Based on the study's results, it was concluded that the computer simulation software was effective in motivating students into self-discovery and in developing their reasoning skills.

Moreover, Salleh, Tasir, and Shukor (2012) developed several web-based simulations for learning Communication and Networking in Education and delivered it through an interactive web-based learning environment. The aim was to enhance students' CT based on interactive simulation features, social constructivist theory, and CT skills. To evaluate the effectiveness of the framework and the approach, a case study involving 21 university students was conducted to investigate the impact of the simulations on the students' CT skills. The results indicated that the implemented web-based simulation learning framework had a positive impact on students' CT skills.

In addition, drill and practice programs offer positive findings in this area of research. For example, Ellis (2001) examined the effectiveness of multimedia in developing the CT capabilities necessary for applying facts learned in solving problems. In his study, a computer-based tutorial and a drill-and-practice program were augmented with multimedia features and administered to 38 male and female students enrolled in Introduction to Computers classes and Medical Office Procedures in the Division of Continuing Education campus in the Nova Southeastern University in the United States. The findings revealed that multimedia-enhanced educational products are potentially effective in developing CT skills.

Jonassen et al. (1998) investigated a different type of computer software called 'Mindtools software' to promote CT. They described this software as a computer application that, when used by students to represent what they know, engaged them in reflective CT about the ideas they are studying, and helped them scaffold different forms of reasoning about content. Therefore, they argued that using this type of software helps in promoting students' higher level thinking skills such as CT. However, they emphasised the importance of conducting more research on this type of software.

Moreover, some learning management systems, such as Blackboard, offer some features that support student-centred learning approaches. This approach aims to develop learner autonomy and independence by shifting the responsibility for the learning path to the students (Garrison 1992). Researchers (Pedersen & Liu 2003; Jones 2007; Hannafin & Hannafin 2010) have agreed that that this style of learning (students-centred learning) treats students seriously as active participants in their own learning and fosters transferable skills such as problem-solving, reflective thinking, and CT.

Astleitner (2002) reviewed studies in the area of using technology with direct instructions to enhance CT (e.g. Stenning, Cox, & Oberlander 1995; Gokhale 1996). He stated that using technology, such as Internet websites and computer software, to facilitate self-learning had a positive effect and can be used to enhance CT skills; however, he advised further research. Although significantly more research has been conducted in this area compared to the previous approach, because of the rapid growth of technology, there is a need for further research.

Using technology with indirect instruction.

In this approach, technology can deliver some instructional functions within a traditional learning environment, where the teacher still controls and evaluates the learning process (Astleitner 2002). Based on the present study's survey of the literature, it seems clear that this approach had been studied more extensively than the two previous approaches of integrating technology to enhance CT. The research provided different technology strategies that could be applied within this approach, such as online discussions, web-based learning, inquiry-based learning, and SN websites. The next section provides some examples of this strategy.

Teachers can engage their students in a wide range of activities that can contribute to intellectual growth. Diamond (1998) reviewed students in a distance-learning program at the University of Massachusetts that used an online Café (WebCT's chat) for idea generation and online help sessions. The bulletin board offered the possibility for coaching discussions to take students' ideas to the next level to attain deeper, more intellectual, and reflective learning through e-mail, or enable faculty communication with students one-on-one or one-to-many. Presentation tools provided students the opportunity to work collaboratively on project planning, peer editing, and research reports. All of these tools can give students practice in sharpening their CT skills. Moreover, Newman, Johnson, Cochrane, and Webb (1996) explored the quality of learning and depth of CT in seminars conducted via a computer conferencing system. Their findings indicated that computer conference discussions promoted significantly deeper CT than face-to-face seminars.

According to Mandernach (2006), using online instructional technology to support the traditional classroom imparts two distinct benefits for teachers wishing to enhance students' CT about the course material. First, it provides a means of moving lower-level learning tasks outside of class time, so that limited student contact time can be devoted to higher-order CT activities. Second, it fosters the use of constructivist teaching philosophies by supplementing traditional face-to-face activities with opportunities for individualised, in-depth interactions with the course material. However, the focus should not be on the technology itself; the emphasis must rather be on the careful selection of appropriate online instructional strategies to meet course content and process goals.

A significant number of teachers have investigated the role of online discussions in their teaching. Simkins (1999) suggested that Web-based tools, such as online discussions, can provide a different learning environment with interesting new opportunities for collaborative learning. Chizmar and Walbert (1999) used online discussions to help students clarify their thinking on different topics explained in class, and to identify what they found to be the most important or least understood idea among those discussed. Vachris (1999) used online discussions as part of a strictly online principles course to have students comment on a reading assignment.

Greenlaw and Deloach (2003) argued that when used effectively, online discussions can provide a natural framework for teaching CT to a group, as they can capture the best features of traditional writing assignments and in-class discussions. They based this on several factors: first, online discussions change the focus of the learning process, replacing the single view of the teacher with a variety of views from students. Second, this variety of views implicitly requires readers to compare and evaluate these views. Third, the asynchronous nature of online discussions provides participants time to reflect on what others have said and how they wish to respond. Finally, unlike class discussions, every participant has the opportunity to be fully heard.

In addition, MacKnight (2000) confirmed that teaching CT through online discussions is an important strategy in advancing teaching and learning in electronic forums. He stated that online discussions offer the potential for collaboration and increased participation in the learning process, as well as reflection, peer tutoring, and

monitoring of student learning as it occurs as an extension of classroom learning. He suggested some steps that should be used to support online discussions:

1. Maintain a focused discussion;
2. Keep the discussion intellectually responsible;
3. Stimulate the discussion by asking probing questions that hold students accountable for their thinking;
4. Infuse these questions in the mind of students;
5. Encourage full participation;
6. Periodically summarise what has or needs to be done (p.39).

Finally, Mandernach (2006, p. 45) suggested a similar type of online discussion that he named 'Online Asynchronous Threaded Discussions' to promote students' CT. Threaded discussion boards provide the opportunity to fully utilise the benefits of student-teacher and student-student interactions in an environment that encourages planned, meaningful, and prepared discussions. It creates an outlet for in-depth interactions that may require additional thought, investigation, or research.

Another strategy that can be used to enhance CT through using technology is web-based inquiry learning such as WebQuest, which is a type of resources-based learning (MacGregor and Lou 2006). It is a strategy that requires students to analyse, synthesise, and exercise information seeking strategies that represent higher levels of thinking skills (Dodge 1995; MacGregor & Lou 2006). MacGregor and Lou (2006) argue that this approach has great potential to improve the development of higher-order cognitive skills, CT, and problem-solving skills that the fast-paced information age demands. However, in order for it to work effectively, students need support and a framework for developing the requisite skills.

MacGregor and Lou (2006) designed a WebQuest intervention to obtain a better understanding of how to enhance the pedagogical effectiveness of WebQuest and of how students interact with the various features inherent to informational websites. The main objective was to explore the effectiveness of inquiry-based learning on students' CT skills. A total of 32 students from fifth-grade classes were the subject for this inquiry-based learning (WebQuest activities) in their science classroom over a three-week period. The findings indicated that concept mapping templates, coordinated with the research tasks, enhanced students' free recall, the application of acquired knowledge, and helped promote higher level thinking skills such as CT.

In inquiry-based learning, particularly on the Web, a significant number of resources are available with a few easy clicks of a computer mouse. However, unlike reference books and journals in a library, anyone can publish on the Web without being reviewed or approved by experts, and without following any standards in the design of the website's homepage (Nielsen & Tahir 2001). Thus, in Web resource-based learning, learners are challenged with the need to quickly and critically evaluate both the credibility and content relevance of a website for a given task.

Another trend that can be used to enhance CT through using social networking websites. The continued growth of educational technologies challenges teachers to discover a novel technology that will assist current learning situations and their objectives. Modern technologies and associated networks, such as blogs, wikis, YouTube, Twitter, and Facebook, which are called Web2.0 tools or social networking websites (SN), have been studied intensively over the last decade, (see Bryant 2006; Mandernach 2006; Bosch 2009; Carlisle 2010; Buus 2012). The studied Bryant (2006), Bosch (2009), Sun (2009), Carlisle (2010) and Buus (2012) indicated that using SN websites for educational purposes fit well with the current educational policies of many countries, such as the United Kingdom and the United States, who are aiming to develop their educational practices and outcomes. Furthermore, they are consistent with several learning theories, such as constructivism and social constructivism, in addition to offering educational advantages in several learning situations.

While reviewing the literature, the present study identified some studies that attempted to explore the effect of SN websites on teaching and promoting students' CT indirectly. The focus of the research was on other aspects, such as social relationships and communication that, in turn, could help promote students' CT.

According to Duffy (2008), participation via blogs could promote higher-level thinking skills such as critical, analytical, creative, intuitive, associational, and analogical thinking. He suggested several ways to uses blog in education in order to promote these skills, such as comments based on subjects and student responses; a collaborative space for students to act as reviewers for course materials; and an online space for review of works and projects or a space to provide peer reviews. Duffy (2008) stated that within the structure of a blog, students could demonstrate CT, take creative risks, and make advanced use of language and design elements. In doing so,

students acquire creative, critical, communicative, and collaborative skills that may be useful to them in both scholarly and professional contexts. The growing popularity of blogs suggests the possibility that some of the work that students need to do in order to read well, respond critically and write vigorously might be accomplished under circumstances that are dramatically different from those currently utilised in education.

Moreover, Yang (2005) explained how he used blogs as a reflective platform for the student teacher training programme in Taiwan in order to encourage students to engage in CT. The student teachers made use of blogs as a platform to critically reflect on their learning processes as well as to gauge the impact of blogs on their own professional growth. He qualitatively analysed the data, which consisted of the messages and comments posted by the student teachers on the blog. The findings revealed that the student teachers actively discussed different topics related to their training programme and their academic career through blogs. All the participants reflected on their experiences and made significant comments. However, using blogs for reflection does not guarantee the acquisition of CT skills, indicating the need for further research in this area.

In addition, Hadjerrouit (2011) claimed that the collaborative feature of some SN websites, such as wikis, could potentially provide teachers with significant opportunities to enhance CT. He argued that wikis could create socially engaged tasks that require active student participation and collaboration. Wikis allow students to work together to develop content on the web, imparting to them a sense of how writing can be collaborative. This type of practice offers opportunities not only to practise writing and reading skills but also to stimulate reflection, knowledge sharing, and critical thinking.

Mandernach (2006) argued that technologies such as blogs and wikis offer different instructional advantages in promoting students' CT skills, and he suggested some uses for these websites in order to enhance CT. For example, blogs may be used within a course management system (usually private) or on several free, public blog sites available throughout the Internet (typically classified based on common theme, topic, or point of interest). In addition, wikis have the advantage of allowing students to easily add and edit content. They are thus particularly suited for collaborative writing or group projects, which, through practice, will enhance students' CT.

Yunus, Salehi, and Chenzi (2012) stated that using SN websites in writing and reading could improve creative thinking skills. Since students write directly on SN websites, shy students may be less afraid to post publicly. On the discussion platforms offered through these websites, students exchange ideas in order to improve their CT skills. SN websites provide more access and opportunity for interaction, planning, and gathering more information. In general, they could be effective for students to promote CT by practising SN reading and writing activities. However, Minocha (2009) claims that there are few novel practices for using SN websites to promote CT skills. Most of the studies have been reviewed used SN websites as a platform for discussion and communication, on the basis that discussion in itself will develop CT skills. However, the use of SN in higher education is still at an early stage (Alabdulkareem 2015), necessitating additional research.

CONCLUSION

The extant literature has provided a solid understanding of the concept of CT, and there is no debate about the importance of teaching CT skills. However, reviewing the literature indicated for main arguments between the researchers in the field of teaching CT skills. First, researches disagree on where to teach CT; whether CT should be taught in specific courses of CT skills (CT as an isolated set of skills), or in general courses (as part of other subjects). Every approach has its own strengths and weaknesses, therefor, the decision regarding to where to teach CT is based on the nature of the course and its goals.

Second, although there is agreement that CT is a human cognitive process that enables one to use a specific set of cognitive skills, significant controversy surrounds which skills should be taught to develop such thinking. Researchers disagree about the skills that make a person a critical thinker, however, it seems evident from the literature that there is general agreement that CT includes a range of mental processes and skills such as interpretation, analysis, evaluation, inference, explanation and self-regulation.

Third, it is important for the teacher to decide how to teach and assess CT skills. A review of the CT teaching strategies shows that there are various methods and activities that can be used to enhance students CT skills. Moreover, there seems to be overlap and confusion between CT teaching strategies and assessment strategies as many people think they are the same; however, there are differences between them. The effective assessment of students' CT skills is a major issue for education. The issue here is whether teachers, during the process of a CT assessment, can reliably assess the level of a student's CT. In fact, assessment remains a major concern in developing instructional activities to enhance students' CT skills.

Finally, many researchers have tried to investigate the role of integrating technology to enhance CT skills. Nevertheless, there is still much room to better understand the impact of using different pedagogical strategies and technology in enhancing student CT. Reviewing the literature revealed that studies seldom attempted to explore the effect of new technology such as SN websites on teaching and promoting students' CT in a direct way, and there is a need for further studies on technology and its effect on promoting CT skills in particular.

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REFERENCES

Alabdulkareem, S. (2015). Exploring the use and the impacts of social media on teaching and learning science in Saudi. *Procedia-Social and Behavioral Sciences, 182*, 213-224.

Alfadhli, S. (2008). *Developing critical thinking in e-learning environment: Kuwait University as a case study* (PhD thesis).

Alwehaibi, H. (2012). Novel program to promote critical thinking among higher education students: Empirical Study from Saudi Arabia. *Asian Social Science, 8*(11), 193.

Andrade, H. (2000). Using rubrics to promote thinking and learning. *Educational Leadership, 57*(5), 13-18.

Astleitner, H. (2002). Teaching critical thinking online. *Journal of Instructional Psychology, 29*(2), 53-76.

Bean, J. (2011). *Engaging ideas: the professor's guide to integrating writing, critical thinking, and active learning in the classroom* (2nd ed.). San Francisco: Jossey-Bass.

Bensley, D., Crowe, D., Bernhardt, P., Buckner, C., & Allman, A. (2010). Teaching and assessing critical thinking skills for argument analysis in psychology. *Teaching of Psychology, 37*(2), 91-96.

Bosch, T. (2009). Using online social networking for teaching and learning: Facebook use at the University of Cape Town. *Communication: South African Journal for Communication Theory and Research, 35*(2), 185-200.

Bryant, T. (2006). Social software in academia. *Educause Quarterly, 29*(2), 61-64.

Buus, L. (2012). Scaffolding teachers integrate social media into a problem-based learning approach? *Electronic Journal of e-Learning, 10*(1), 13-22.

Carlisle, M. (2010). Using YouTube to enhance student class preparation in an introductory Java course. In *Proceedings of the 41st ACM technical symposium on Computer science education ACM*. ACM, 10 Mar 2010.

Chizmar, J., & Walbert, M. (1999). Web-based learning environments guided by principles of good teaching practice. *The Journal of Economic Education, 30*(3), 248-259.

Cohen, A., & Spencer, J. (1993). Using writing across the curriculum in economics: Is taking the plunge worth it? *The Journal of Economic Education, 24*(3), 219-230.

Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (7th ed.). USA and Canada: Routledge.

Condon, W., & Kelly-Riley, D. (2004). Assessing and teaching what we value: The relationship between college-level writing and critical thinking abilities. *Assessing Writing, 9*(1), 56-75.

Cottrell, S. (2005). *Critical thinking skills: developing effective analysis and argument.* Basingstoke: Palgrave Macmillan.

Crammond, J. (1998). The uses and complexity of argument structures in expert and student persuasive writing. *Written Communication, SAGE journals, 15*(2), 230-268.

Diamond, N. (1998). Adding on-line computer methods to your repertoire of teaching strategies. *Teaching Excellence: Toward the Best in the Academy, 9*(6), 1-2.

Dick, R. (1991). An empirical taxonomy of critical thinking. *Journal of Instructional Psychology, 18*(2), 79-93.

Dodge, B. (1995). Some thoughts about WebQuests. *The Distance Educator, 1*(3), 12-15.

Duffelmeyer, B. (2000). Critical computer literacy: Computers in first-year composition as topic and environment. *Computers and Composition, 17*(3), 289-307.

Duffy, P. (2008). Engaging the YouTube Google-eyed generation: Strategies for using Web 2.0 in teaching and learning. *Electronic Journal e-Learning, 6*(2), 119-130.

Duron, R., Limbach, B., & Waugh, W. (2006). Critical thinking framework for any discipline. *International Journal of Teaching and Learning in Higher Education, 17*(2), 160-166.

Edman, L. (2002). Teaching critical thinking in the honors classroom. In Fuiks, C. & Clark, L. (eds.), *Teaching and Learning in Honors* (2nd ed.). Lincoln: National Collegiate Honors Council.

Ellis, T. (2001). Multimedia enhanced educational products as a tool to promote critical thinking in adult students. *Journal of Educational Multimedia and Hypermedia, 10*(2), 107-124.

Ennis, R. (1993). Critical thinking assessment. *Theory into Practice, 32*(3), 179-186.

Facione, P. (1990). Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction, *Research Findings and Recommendations*, American Philosophical Association, Newark, Del.
Facione, P., & Facione, N. (1994). Holistic critical thinking scoring rubric A Tool for Developing and Evaluating Critical Thinking, *California Academic Press, Insight Assessment, Millbrae*, 18-21.
Fisher, R. (1998). Thinking about thinking: developing metacognition in children. *Early Child Development and Care, 141*(1), 1-15.
Fuiks, C., & Clark, L. (2002). Teaching and learning in honors. *National Collegiate Honors Council, NCHC Monographs Series*, 1-128.
Garrison, D. (1992). Critical thinking and self-directed learning in adult education: An analysis of responsibility and control issues. *Adult Education Quarterly, 42*(3), 136-148.
Gelder, T. (2005). Teaching critical thinking: Some lessons from cognitive science. *College Teaching, 53*(1), 41-48.
Giancarlo, C., & Facione, P. (2001). A look across four years at the disposition toward critical thinking among undergraduate students. *The Journal of General Education, 50*(1), 29-55.
Gokhale, A. (1996). Effectiveness of computer simulation for enhancing higher order thinking. *Journal of Industrial Teacher Education, 33*(4), 36-46.
Greenlaw, S., & DeLoach, S. (2003). Teaching critical thinking with electronic discussion. *The Journal of Economic Education*, 34(1), 36-52.
Hadjerrouit, S. (2011). A collaborative writing approach to wikis: Design, implementation, and evaluation. *Issues in Informing Science and Information Technology, 8*, 431-449.
Hager, P., Sleet, R., Logan, P., & Hooper, M. (2003). Teaching critical thinking in undergraduate science courses. *Science & Education, 12*(3), 303-313.
Halpern, D. (1997). Teaching critical thinking for transfer across domains: Disposition, skills, structure training, and metacognitive monitoring. *American Psychologist, 53*(4), 449-455.
Halpern, D. (1999). Teaching for critical thinking: Helping college students develop the skills and dispositions of a critical thinker. *New Directions for Teaching and Learning*, (80), 69-74.
Hannafin, M., & Hannafin, K. (2010). Cognition and student-centered, web-based learning: Issues and implications for research and theory. In Spector, J., Ifenthaler, D., Isaias, P., Kinshuk, and Sampson, D. (Eds.), *Learning and instruction in the digital age* (pp. 11-23). Springer.
Hansen, W., & Salemi, M. (2012). Improving classroom discussion in economics courses. In Hoyt, G. & McGoldrick, K. (Eds.), *International handbook on teaching and learning economics* (pp. 68-78). UK: Edward Elgar.
Hatcher, D. (2006). Stand-alone versus integrated critical thinking courses. *The Journal of General Education, 55*(3), 247-272.
Hopson, M., Simms, R. & Knezek, G. (2014). Using a Technology-Enriched Environment to Improve Higher-Order Thinking Skills. Journal of Research on Technology in Education, 34(2), 109-119.
Jonassen, D., Carr, C., & Yueh, H. (1998). Computers as mindtools for engaging learners in critical thinking. *TechTrends, 43*(2), 24-32.
Jones, L. (2007). *The Student-Centered Classroom.* UK, Cambridge: Cambridge University Press.
Karns, G. (2005). An update of marketing student perceptions of learning activities: Structure, preferences, and effectiveness. *Journal of Marketing Education, 27*(2), 163-171.
Kuek, M. (2010). *Developing critical thinking skills through integrative teaching of reading and writing in the L2 writing classroom* (PhD thesis). Newcastle University.
Kuhn, D. (1999). A developmental model of critical thinking. *Educational Researcher, 28*(2), 16-46.
Kurfiss, J. (1988). *Critical Thinking: Theory, Research, Practice, and Possibilities.* Washington, D.C: Association for the Study of Higher Education.
Lawrence, N., Serdikoff, S., Zinn, T., & Baker, S. (2008). Have we demystified critical thinking. In Dunn, D., Halonen, J., & Smith, R. (Eds.), *Teaching Critical Thinking in Psychology* (1st ed.) United Kingdom: Wiley-Blackwell.
MacGregor, S., & Lou, Y. (2006). Web-based learning: How task scaffolding and web site design support knowledge acquisition. *Journal of Research on Technology in Education, 37*(2), 161-175.
MacKnight, C. (2000). Teaching critical thinking through online discussions. *Educause Quarterly, 23*(4), 38-41.
Mandernach, J. (2006). Thinking critically about critical thinking: Integrating online tools to promote critical thinking. *A Journal of the Center for Excellence in Teaching and Learning,1*, 41-50.
Mansilla, V., Duraisingh, E., Wolfe, C., & Haynes, C. (2009). Targeted assessment rubric: An empirically grounded rubric for interdisciplinary writing. *The Journal of Higher Education, 80*(3), 334-353.
Miles, M., Huberman, M., & Salana, J. (2014). *Qualitative Data Analysis: a Methods Sourcebook* (3rd ed.). London: SAGE.

Minocha, S. (2009). Role of social software tools in education: a literature review. *Education Training, 51*(5/6), 353-369.
Moseley, D., Baumfield, V., Elliott, J., Gregson, M., Higgins, S., Miller, J., & Newton, D. (2005). *Frameworks for thinking: A handbook for teaching and learning.* Cambridge: Cambridge University Press.
Newman, D., Johnson, C., Cochrane, C., & Webb, B. (1996). An experiment in group learning technology: Evaluating critical thinking in face-to-face and computer-supported seminars. *Interpersonal Computing and Technology, 4*(1), 57-74.
Nielsen, J. & Tahir, M. (2001). *Homepage Usability: 50 Websites Deconstructed.* Indianapolis, IN: New Riders.
Paul, R. (1992). Critical thinking: What, why, and how. *New Directions for Community Colleges, 1992*(77), 3-24.
Paul, R., & Elder, L. (2006). *The miniature guide to critical thinking concepts and tools.* (4th ed.). Tomales, CA: The Foundation for Critical Thinking.
Peach, B., Mukherjee, A. & Hornyak, M. (2010). Assessing Critical Thinking: A College's Journey and Lessons Learned. Journal of Education for Business, 82(6), 313-320.
Pedersen, S., & Liu, M. (2003). Teachers' beliefs about issues in the implementation of a student-centered learning environment. *Educational Technology Research and Development, 51*(2), 57-76.
Perkins, D., & Salomon, G. (1989). Are cognitive skills context-bound? *Educational Researcher, 18*(1),16-25.
Pithers, R., & Soden, R. (2000). Critical thinking in education: A review. *Educational Research, 42*(3), 237-249.
Quitadamo, I., & Kurtz, M. (2007). Learning to improve: using writing to increase critical thinking performance in general education biology. *CBE Life Sciences Education, 6*(2), 140-154.
Salleh, S., Tasir, Z., & Shukor, N. (2012). Web-Based Simulation Learning Framework to Enhance Students' Critical Thinking Skills. *International Educational Technology Conference, IETC2012, Procedia-Social and Behavioral Sciences, Elsevier Ltd., 64*(2012), 372-381.
Santos, L., & de Oliveira, M. (1999). Internet as a freeway to foster critical thinking in lab-activities. Paper presented at 1999 *NARST Annual Meeting,* Boston, Massachusetts, 28-31 March 1999.
Scarce, R. (1997). Using electronic mail discussion groups to enhance students' critical thinking skills. *The Technology Source Archives, The University of North Carolina.*
Simkins, S. (1999). Promoting active-student learning using the World Wide Web in economics courses. *The Journal of Economic Education,* 30(3), 278-287.
Stapleton, P. (2001). *Assessing critical thinking in the writing of Japanese university students: insights about assumptions, content familiarity and biology* (PhD thesis).
Stenning, K., Cox, R., & Oberlander, J. (1995). Contrasting the cognitive effects of graphical and sentential logic teaching: reasoning, representation and individual differences. *Language and Cognitive Processes, 10*(3-4), 1-27.
Sun, Y. (2009). Voice blog: An exploratory study of language learning. *Language Learning & Technology, 13*(2), 88-103.
Swartz, R., & Parks, S. (1994). *Infusing the Teaching of Critical and Creative Thinking into Content Instruction: A Lesson Design Handbook for the Elementary Grades.* Pacific Grove, CA: Critical Thinking Press and Software.
Taylor, W. (2002). Promoting critical thinking through classroom discussion. In Fuiks, C. & Clark, L. (Eds.), *Teaching and Learning in Honors* (2nd ed). Lincoln: National Collegiate Honors Council.
Vachris, M. (1999). Teaching principles of economics without "chalk and talk": The experience of CNU online. *The Journal of Economic Education, 30*(3), 292-303.
Wilkinson, G., Bennett, L., & Oliver, K. (1997). Evaluation criteria and indicators of quality for internet resources. *Educational Technology, 37*(3), 52-58.
Williams, R., & Worth, S. (2001). The relationship of critical thinking to success in college, *Inquiry: Critical Thinking across the Disciplines, 21*(1), 5-16.
Yang, Y., Newby, T., & Bill, R. (2005). Using Socratic questioning to promote critical thinking skills through asynchronous discussion forums in distance learning environments. *The American Journal of Distance Education, 19*(3), 163-181.
Yeh, Y., & Strang, H. (1997). The impact of a computer simulation on critical-thinking instruction. *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 994-997). VA: Association for the Advancement of Computing in Education (AACE).
Yunus, M., Salehi, H., & Chenzi, C. (2012). Integrating social networking tools into ESL writing classroom: Strengths and weaknesses. *English Language Teaching, 5*(8), 42.

The Relationship between Attitudes towards Digital Gaming and Sports

Asst. Prof., Sevinç Namlı
Erzurum Technical University Faculty of Sports, Department of Physical Training and Sports,
sevinc.namli@erzurum.edu.tr

Research Assistant Gönül Tekkurşun Demir
Gazi University Faculty of Sports, Department of Physical Training and Sports,
gonultekkursun@hotmail.com

ABSTRACT
The fact that the passion for digital gaming, which brings a sedentary lifestyle, replaces traditional games requiring exercise and physical education also has a negative impact on the health of children and adolescents. In this study, it was aimed to examine and evaluate high school students' attitudes towards digital gaming and sports by certain variables. This study, which aimed to investigate and evaluate high school students' attitudes towards digital gaming and sports, utilized the correlational model. This study was carried out in Tevfik Ileri Anatolian High School in Erzurum in the 2019-2020 academic year. 193 students participated in the study and the distribution of normality of data by each variable was tested with Skewness-Kurtosis and Shapiro-Wilk tests. As a result of the analysis, it was found that the data were not distributed between ±1. Therefore, non-parametric tests were used to analyze the data of the research. To sum, the increase in the attitudes towards digital gaming decreases the attitudes towards sports. It is an indisputable conclusion that playing digital games responsibly contributes to the development of students in some areas. However, the students should be informed about the fact that digital games containing physical activities will increase such a contribution to their mental and physical developments.

Keywords: Digital gaming, Attitudes, Sport, Body mass index (BMI)

INTRODUCTION
Since the beginning of the 21st century, technology has progressed rapidly, devices such as computers, tablets, and smartphones have been introduced to all areas of our lives, and internet access has been almost never interrupted. In the light of such developments, every realm of society, from education, health, and security to transportation, communication, and sports, has been becoming digitalized, facilitated, and accelerated. This is also prominent in the fields of games and entertainment and introduces an innovation called 'digital gaming' to the lives of children (Erboy 2010). The games of the 'age of parents', which prioritize group and social interactions, are obsolete and forgotten, and instead, individual games based on interaction with devices have become widespread. Accordingly, the time spent with digital games, in which the young show interest more, increases day by day, and the desire to play cannot be controlled and leads to changes in emotions and thoughts. (Gentile, 2009; Rideout, Foehr & Roberts, 2010).

Digital games have become a huge market with a budget of about 140 billion dollars (Entertainment Software Association, 2013) and cover seven different gaming types such as tactics, jigsaw puzzle, adventure, action, sports, role-playing, and simulation (Adams & Rollings, 2006). While debates on whether addiction to digital games go on, it is observed that those who consult psychiatry services with complaints about such an addiction and families suffering from this problem are looking for solutions (Griffiths & Meredith 2009). In 2018, the World Health Organization defined digital games or video games within the classification of dependency. It considers the following behaviors as indicators of game addiction:

- starting a game, and frequency and intensity of gaming
- whether the game prevails over other life activities, the priority of gaming,
- continuing to play the game despite adverse consequences.

Today, the young who follow technological developments closely, devote more time to digital games and digital games become prominent among popular culture images of the young.

In addition to all these negative consequences, digital games contribute to some areas of development of children and the young. These contributions include strategic thinking, fast and accurate decision-making, problem-solving, technology inclination, and the ability to use technology. (Tüzün, 2002; Tarhan & Nurmedov, 2011; Akçay & Özcebe, 2012; Şahin & Tuğrul, 2012). In contrast to these contributions, its most important

disadvantages are isolation and alienation of children and the young from the real-life, and consequently being away from social life. Particularly, violent games reinforce the sense of violence of children and cause them to be susceptible to violence. In the aspect of physical development, games that are inherent to be played in sitting position and for long periods of time lead to respiratory, circulatory, and musculoskeletal disorders (Aydoğdu Karaaslan, 2015; Torun, Akçay & Çolaklar, 2015). At the same time, the popularity of digital games causes a decrease in playing mobile and physical-social games, so the severity of the above-mentioned problems increases and becomes widespread.

The weight of sports games is considerable on the preferences of people for the types of digital games. Sports has a universal structure built on the social and cultural infrastructure of society. It has undergone a rapid change in terms of its concept and taken part as a cultural element in defining the concept of nation (Yıldırım et al., 2006).

The term sports is defined by Şentürk as "all of the physical activities called as 'doing sports' among people and all of the activities which are performed in daily life with energy consumption utilizing muscles and joints, and which increase heart and respiratory rate and result in different degrees of fatigue." (Şentürk, 2012).

According to another definition, sports is "something which includes elements such as the one's social harmony and mental and physical health, and winning a competition; which is a discipline suggested by educators in terms of formation and development of personality; which is a spectacle that the masses admire; which is a method used by administrators to shape energy and to awake a combative understanding; and which is a narrative style with advanced rules of a game motivation that gives pleasure and satisfaction to people" (Kat, 2009).

Educational institutions aim at emotional, social, physical, and mental development of children with physical education and sports activities and try to achieve these goals in physical education classes and in-school sports activities. Considering that human being needs education due to its physiological and psychological conditions, the realization of the goals of education is not only possible with intellectually-oriented education but also with physically-oriented education. As parts of general education, physical education and sports are complementary to intellectually oriented education (Yavaş, 1996).

Aim and Significance of the Study

Today, called the age of technology, demand for tablets, phones, computers, and console games is increasing with each passing day with the help of the proliferation of internet access. Digital games, which affect daily life in many ways, lead children, especially those playing outdoor games and with toys, to adopt a sedentary lifestyle. Children do not fulfill many responsibilities that they need to do and delay their academic tasks owing to these games, which are of great interest (Demir & Bozkurt, 2019; Demir & Hazar, 2018).

In the literature, it was found that the age at which children start playing digital games was 4.5 years, and the duration of gaming per day was approximately 3 hours. (Mustafaoğlu & Yasacı, 2018) In a study, it was observed that the frequency of playing computer games increased as the children grew up. (Akçay & Özcebe, 2012) In another study, it was revealed that the age of digital gaming was decreasing and that the age of starting digital gaming was between 1 and 4 years. (Toran, Ulusoy, Aydin, Deveci & Akbulut, 2016). Greenberg, Sherry, Lachlan, Lucas, & Holmstrom. (2010) showed that male adolescents between 10-20 years were more prone to excessive and problematic gaming behaviors than other groups.

The fact that the passion for digital gaming, which brings a sedentary lifestyle, replaces traditional games requiring exercise and physical education also has a negative impact on the health of children and adolescents. Even if it helps to develop abilities such as quick decision-making and attention, it has adverse effects on obesity, circulatory system, muscle pain, and bone development and reduces children's interests in sports.

In this study, it was aimed to examine and evaluate high school students' attitudes towards digital gaming and sports by certain variables. In this context, Gökçearslan and Durakoğlu (2014) indicate the passion for digital gaming, which leads to a decrease in participation in exercise, vary by gender; Mustafaoğlu and Yasacı, (2018) point out that daily average gaming period is 3 hours; and Hazar and Hazar (2017) state that gaming causes obesity due to sedentary life. Therefore, the following sub-questions are tried to be answered based on the literature:

1. Does taking an active role in sports clubs or not affect the students' mean body mass indexes?
2. Is there a significant relationship between high school students' attitudes towards digital gaming and sports?

3. Is there a significant relationship between high school students' attitudes towards digital gaming and sports by the age variable?
4. Is there a significant relationship between high school students' attitudes towards digital gaming and sports by the gender variable?
5. Is there a significant relationship between high school students' attitudes towards digital gaming and sports by BMI index?
6. Is there a significant relationship between high school students' attitudes towards digital gaming and sports by the daily gaming period?
7. Is there a significant relationship between high school students' attitudes towards digital gaming and sports by the daily sports period?

METHOD

This study, which aimed to investigate and evaluate high school students' attitudes towards digital gaming and sports, utilized the correlational model. With the help of this model, which is among descriptive research methods, it is aimed to reach a generalizable result as a result of a measurement tool to be administered to a sample from large groups or the whole universe (Karasar, 2009).

Limitations and Permissions of the Study

Limitations and permissions of the study are gathered under four items:
1. The data collected in the research is limited to the measurement tools pertaining to digital gaming and attitudes towards sports.
2. The data were collected from a high school located in Erzurum with the ethical approval of the ethics committee of the university where the researcher is employed, and permission obtained from Yakutiye District Directorate of National Education.
3. Only the survey technique was used in data collection process.
4. Only the SPSS package program was used for the analysis of the collected data.

Study Group

This study was carried out in Tevfik Ileri Anatolian High School in Erzurum in the 2019-2020 academic year. 227 students participated in the study, and 34 of them that were found to deliver incomplete and erroneously filled questionnaires were not included in the analysis. The demographic variables of the participants are shown in Table 1.

Table 1. Descriptive Statistics Regarding Participants' Being an Athlete of a Club, and Their Gender and BMI

				BMI				
				Normal Weight	Overweight	Obese	Lean	Total
Being an Athlete of a Club	Yes	Gender	Female	13(%21.6)	4(%6.7)	5(%8.3)	0	22
			Male	18(%30.0)	9(%15.0)	8(%13.4)	3(%5.0)	38
			Total	31(%51.6)	13(%21.7)	13(%21.7)	3(%5.0)	**60**
	No	Gender	Female	26(%19.5)	16(%12.0)	20(%15.0)	2(%1.5)	64
			Male	32(%24.0)	14(%10.6)	18(%13.6)	5(%3.85)	69
		Total		58(%43.5)	30(%22.6)	38(%28.6)	7(%5.30)	**133**

(BMI data were calculated and classified according to the data of the World Health Organization.)

In mean BMI of the participants by the variable of being an athlete of a club, while there were 13 (21.7%) overweight and 13 (21.7%) obese participants among those doing sports, there were 30 overweight (30.6%) and 38 obese (28.6%) participants among those not doing sports.

Data Collection Tools

The Digital Gaming Attitude Scale (DGAS): The scale developed by Demir and Bozkurt (2019) consists of a total of 18 items under the subscales of Cognitive (first 5 items), Affective (5 items), and Behavioral (last 8 items). Items 2, 3, 5, 6, 7, 10, and 18 contain negative statements. Demir and Bozkurt (2019) found the Cronbach's Alpha values of the subscales of Cognitive, Affective, and Behavioral of the DGAS to be .90, .81, and .91, respectively. According to the findings of the study, the Cronbach's Alpha values were found to be .78 for the Cognitive subscale, .71 for the Affective subscale, and .86 for the Behavioral subscale. The total variance explained by the scale was found to be 65.11%. A rating was done based on the lowest score that one can obtain from the scale and its multiples. Thus, the attitudes of the participants towards digital gaming were rated based on the scores 1-18 (very low), 19-37 (low), 38-54 (moderate), 55-72 (high), and 73- 90 (very high). *The*

Cognitive Subscale represents the items about participants' cognitive status and their ideas and knowledge about digital games. *The Emotional Subscale* represents items about participants' emotional states such as love and hate towards digital games. Finally, *the Behavioral Subscale* represents the items about participants' discourses and actions towards digital gaming.

The Sports Attitude Scale: The scale developed by Koçak (2014) consists of a total of 22 items under the subscales of Psychosocial Development (first 12 items), Physical Development (6 items), and Mental Development (last 4 items). There is no reverse item on the scale. Koçak (2014) found the Cronbach's Alpha values of the subscales of Psychosocial Development, Physical Development, and Mental Development of the Sports Attitude Scale to be .89, .86, and .76, respectively. According to the findings of the study, the Cronbach's Alpha values were found to be .90 for the Psychosocial Development subscale, .85 for the Physical Development subscale, and .89 for the Mental Development subscale. The total variance explained by the scale was found to be 50.35%.

Data Analysis

In the study, the distribution of normality of data by each variable was tested with Skewness-Kurtosis and Shapiro-Wilk tests. As a result of the analysis, it was found that the data were not distributed between ±1. Therefore, non-parametric tests were used to analyze the data of the research. Spearman's Rho Correlation test was used to find the relationship between the two scales by the age variable. The Mann-Whitney U test was used to compare mean scores on the subscales with gender and being an athlete of a club. The Kruskal-Wallis test was used to compare BMI, daily gaming period, and daily sports period. Dunn' Post Hoc test was used to determine which groups had significant differences. The significance level was taken as 0.05.

FINDINGS

The statistical results of the collected data are presented in this section of the research. The statistical results of the relationship between the participants' attitudes towards digital gaming and sports are given in Table 2.

Table 2. The Relationship Between the DGAS and the Sports Attitude Scale

			The Sports Attitude Scale		
			Psychosocial Development	Physical Development	Mental Development
The DGAS	Cognitive	r	-.139	**-.215****	-.067
		p	.056	.003	.361
		N	189	187	189
	Affective	r	-.112	**-.263****	**-.165***
		p	.120	.000	.022
		N	193	191	193
	Behavioral	r	.008	-.119	**-.206***
		p	.915	.103	.934
		N	192	190	192

(p<0.05).

Table 2 shows the results of the Spearman's Rho Correlation test to determine the relationship between the DAS and the Sports Attitude Scale. Accordingly, there were negative and low significant differences between the Cognitive subscale and Physical Development subscale (r = -.215), between the Affective subscale and Physical Development subscale (r = -.263), and between the Behavioral subscale and Mental Development subscale (r = -.165) (p <0.05).

The results of the analysis of the participants' attitudes towards digital gaming and sports by the gender variable are given in Table 3.

Table 3. Mann-Whitney U Test Results by Gender

Scale		Gender	N	Mean rank	Sum of ranks	Mann Whitney U	Z	p
DGAS	Cognitive	Female	86	81.38	6836.00	3266.000	-3.070	.00*
		Male	107	105.90	11119.00			
	Affective	Female	86	79.95	6875.50	3134.500	-3.812	.00*
		Male	107	110.71	11845.50			

	Behavioral	Female	86	76.48	6577.50	2836.500	-4.501	.00*
		Male	106	112.74	11950.50			
Sports Attitude Scale	Psychosocial Development	Female	86	102.39	8805.50	4137.500	-1.208	.22
		Male	107	92.67	9915.50			
	Physical Development	Female	84	104.00	8736.00	3822.000	-1.809	.07
		Male	107	89.72	9600.00			
	Physical Development	Female	86	98.59	8478.50	4464.500	-.366	.71
		Male	107	95.72	10242.50			

($p<0.05$).

Table 3 shows the findings of the Mann Whitney U test which was conducted to determine the relationship between the gender variable and the subscales of the DGAS and the Sports Attitude Scale. Therefore, a significant difference was found between the gender of participants and their mean scores on the subscales of the DGAS. Accordingly, the mean scores of males were found to be significantly higher than of females on the Cognitive subscale (A = -3.070; p =.00 <.05), Affective subscale (A = -3.812; p =.00 <.05), and Behavioral subscale (A = -4.501; p =.00 <.05).

The results of the analysis of the participants' attitudes towards digital gaming and sports by the BMI variable are given in Table 4.

Table 4. Kruskal-Wallis Test Results by BMI

		BMI	N	Mean Rank	x^2	p	Sig. Dif.
DGAS	Cognitive	Lean	10	82.53	.647	.78	-
		Normal Weight	89	97.96			
		Overweight	43	96.04			
		Obese	51	93.16			
	Affective	Lean	10	109.67	1.064	.23	-
		Normal Weight	89	94.70			
		Overweight	43	102.29			
		Obese	51	91.86			
	Behavioral	Lean	10	112.33	1.044	.36	-
		Normal Weight	89	92.22			
		Overweight	43	98.23			
		Obese	51	96.76			
Sports Attitude Scale	Psychosocial Development	Lean	10	112.87	28.983	.00*	2*-1-3-4
		Normal Weight	89	124.17			
		Overweight	43	74.35			
		Obese	51	71.56			
	Physical Development	Lean	10	107.23	28.879	.00*	2*-1-4-3
		Normal Weight	89	122.33			
		Overweight	43	70.92			
		Obese	51	75.64			
	Mental Development	Lean	10	94.57	30.816	.00*	2*-1-3-4
		Normal Weight	89	124.54			
		Overweight	43	79.33			
		Obese	51	71.68			

($p<0.05$).

Table 4 shows the results of the Kruskal-Wallis test, which was conducted to determine the differences between the subscales of the DGAS and the Sports Attitude Scale by the participants' body mass indexes. Groups showing significant differences in favor are indicated by *. Thus, a significant difference was found between the BMI variable and the subscales of the Sports Attitude Scale. Accordingly, the mean scores of normal-weight participants ($\bar{x}$ = 124.17) were found to be significantly higher than of lean ($\bar{x}$ = 112.87), overweight ($\bar{x}$ = 74.35), and obese ($\bar{x}$ = 71.56) participants on the Psychosocial Development subscale (p <0.05). Besides, it was found the mean sores of normal-weight participants ($\bar{x}$ = 122.33) were significantly higher than of lean ($\bar{x}$ =

107.23), obese ($\bar{x}$ = 75.64), and overweight ($\bar{x}$ = 70.92) participants on the Physical Development sub-scale (p <0.05). On the Mental Development subscale, the mean scores of normal-weight participants ($\bar{x}$ = 124.54) were significantly higher than of lean ($\bar{x}$ = 94.57), overweight ($\bar{x}$ = 79.33), and obese ($\bar{x}$ = 71.68) participants (p <0.05).

The results of the analysis of the participants' attitudes towards digital gaming and sports by the variable of daily gaming period are given in Table 5.

Table 5. Kruskal-Wallis Test Results by Daily Gaming Period

		Period	N	Mean Rank	x^2	p	Sig. Dif.
DGAS	Cognitive	30-60 min.	52	56.48	33.593	.00	3*4-2-1
		61-90 min.	75	89.33			
		91-120 min.	25	119.14			
		120 min. and over	41	108.45			
	Affective	30-60 min.	52	52.61	40.524	.00	4*-2-3-1
		61-90 min.	75	98.18			
		91-120 min.	25	95.61			
		120 min. and over	41	122.89			
	Behavioral	30-60 min.	52	49.89	47.042	.00	3*4-2-1
		61-90 min.	75	93.30			
		91-120 min.	25	121.45			
		120 min. and over	41	115.24			
Sports Attitude Scale	Psychosocial Development	30-60 min.	52	90.92	.564	.90	-
		61-90 min.	75	87.28			
		91-120 min.	25	81.64			
		120 min. and over	41	86.11			
	Physical Development	30-60 min.	52	96.64	4.658	.19	-
		61-90 min.	75	86.47			
		91-120 min.	25	77.82			
		120 min. and over	41	72.87			
	Mental Development	30-60 min.	52	96.22	2.924	.40	-
		61-90 min.	75	82.22			
		91-120 min.	25	82.25			
		120 min. and over	41	90.48			

(p<0.05).

Table 5 reveals the results of the Kruskal-Wallis test, which was conducted to determine the differences between the subscales of the DGAS and the Sports Attitude Scale by the participants' daily gaming periods. Groups showing significant differences in favor are indicated by *. Accordingly, it was found that the mean scores of those spending 91-120 min. a day for gaming ($\bar{x}$ = 119.14) were significantly higher than of those spending 120 min. and over ($\bar{x}$ = 108.45), 61-90 min. ($\bar{x}$ = 89.33), and 30-60 min. ($\bar{x}$ = 56.48) on the Cognitive subscale (p <0.05). On the Affective subscale, the mean scores of those spending 120 min. and over a day for gaming ($\bar{x}$ = 122.89) were found to be significantly higher than of those spending 61-90 min. ($\bar{x}$ = 93.30), 91-120 min. ($\bar{x}$ = 95.61), and 30- 60 min. ($\bar{x}$ = 52.61) (p <0.05). Finally, the mean scores of those spending 91-120 min a day for gaming ($\bar{x}$ = 121.45) were found to be significantly higher than of those spending 120 min. and over ($\bar{x}$ = 115.24), 61-90 min. ($\bar{x}$ = 93.30), and 30- 60 min. ($\bar{x}$ = 49.89) on the Behavioral subscale (p <0.05).

The results of the analysis of the participants' attitudes towards digital gaming and sports by the variable of daily sports period are given in Table 5.

Table 6. Kruskal-Wallis Test Results by Daily Sports Period

		Period	N	Mean Rank	x^2	p	Sig. Dif.
DGAS	Cognitive	30-60 min.	75	79.56	5.427	14	-
		61-90 min.	77	93.83			
		91-120 min.	31	95.34			
		120 min. and over	10	113.35			
	Affective	30-60 min.	75	83.02	4.143	.24	-
		61-90 min.	77	93.65			
		91-120 min.	31	100.27			
		120 min. and over	10	112.00			
	Behavioral	30-60 min.	75	78.65	9.783	.02*	4*-2-1
		61-90 min.	77	96.50			
		91-120 min.	31	96.98			
		120 min. and over	10	128.70			
Sports Attitude Scale	Psychosocial Development	30-60 min.	75	87.58	11.109	.01*	4*3-1-2
		61-90 min.	77	83.07			
		91-120 min.	31	114.31			
		120 min. and over	10	120.35			
	Physical Development	30-60 min.	75	92.55	3.734	.04	3*2
		61-90 min.	77	85.01			
		91-120 min.	31	105.26			
		120 min. and over	10	83.15			
	Mental Development	30-60 min.	75	88.65	5,600	,02	3*2-4
		61-90 min.	77	88.62			
		91-120 min.	31	111.37			
		120 min. and over	10	79.75			

($p<0.05$).

Table 6 presents the results of the Kruskal-Wallis test, which was conducted to determine the differences between the subscales of the DGAS and the Sports Attitude Scale by the participants' daily sports periods. Groups showing significant differences in favor are indicated by *. Accordingly, on the Behavioral subscale, the mean scores of the participants doing sports 120 min or over a day ($\bar{x}$ = 128.70) were found to be significantly higher than of those doing sports 61-90 min. ($\bar{x}$ = 96.50), and 30-60 min. ($\bar{x}$ = 78.65) ($p <0.05$). Besides, the mean scores of the participants doing sports 120 min. and over a day ($\bar{x}$ = 120.35) were found to be significantly higher than of those doing sports 91-120 min. ($\bar{x}$ = 114.31), 30-60 min. ($\bar{x}$ = 87.58), and 61 -90 min. ($\bar{x}$ = 83.07) on the Psychosocial Development subscale ($p <0.05$). It was also found that the mean scores of the participants doing sports 91-120 min. a day ($\bar{x}$ = 111.37) were significantly higher than of those doing sports 61-90 min. ($\bar{x}$ = 88.62), and 120 min. and over ($\bar{x}$ = 79.75) on the Physical Development subscale ($p <0.05$).

The results of the analysis of the participants' attitudes towards digital gaming and sports by the variable of being an athlete of a club are given in Table 7.

Table 7. Mann-Whitney U Test Results by Being an Athlete of a Club

Scale			N	Mean Rank	Sum of Ranks	Mann Whitney U	Z	p
DGAS	Cognitive	Yes	60	112.76	6314.50	2729.500	-2.904	.00*
		No	133	87.52	11640.50			
	Affective	Yes	60	112.17	6281.50	2986.500	-2.418	.01*
		No	133	90.80	12439.50			
	Behavioral	Yes	60	107.92	5935.50	3139.500	-1.806	.07
		No	133	91.92	12592.50			
Sports Attitude Scale	Psychosocial Development	Yes	60	107.65	6028.50	3239.500	-1.703	.08
		No	133	92.65	12692.50			
	Physical Development	Yes	60	104.16	5833.00	3323.000	-	.18

	No	133	92.61	12503.00		1.341	
Mental Development	Yes	60	111.22	6228.50	3039.500	-2.341	.01*
	No	133	91.19	12492.50			

(p=.01<.05).

Table 7 presents the findings of the Mann Whitney U test, which was conducted to determine the relationship between the variable of being an athlete of a club and the subscales of the DGAS and the Sports Attitude Scale. Therefore, significant differences were found between the participants' mean scores on the Cognitive and Affective subscales and the Cognitive and Mental Development subscales by the variable of being an athlete of a sports club. Accordingly, on the subscales of Cognitive (A = -2.904; p =.00 <. 05) and Affective (A = -2.418; p =.01 <.05), it was found that the mean scores of those playing in a sports club are significantly higher than of the mean scores of those who do not. Moreover, it is the case on the Mental Development subscale (A = -2.341; p =.01 <.05).

RESULT AND RECOMMENDATIONS

With Hazar's (2018) words, digital games have become the plague of our age and started to affect all age groups at the level of addiction. It has become the focus of the attention of researchers because of its up-to-date nature as well as research on its benefits and harms. Some of the researchers argue the benefits of digital games on subjective well-being (Allahverdipour et al., 2010), decision-making (Ferguson and Olson, 2014), overcoming mental problems (Hagström & Kaldo, 2014; Przybylski et al., 2011; Snodgrass et al., 2011). Others, on the other hand, assert that they lead individuals to psychological problems, sleep disorders (Wolfe et al., 2014), sedentary life, and obesity (Bozkurt et al., 2018) as the gaming period increases. Park (2014), who concluded that long-term digital gaming caused malnutrition and obesity, also found that the gamers were getting away from exercise-sports.

In this study conducted to uncover high school students' attitudes towards digital games and sports in the light of previous studies in the literature, the numbers of overweight and obese participants among those doing sports were the same 13 (21.7%). On the other hand, the number of overweight participants among those not doing sports was 30 (22.6%), while this was 38 (28.6%) for obese ones. Therefore, the numbers of overweight and obese students who attend sports clubs are less than those who do not attend any sports club. However, a difference of 10% is interesting. Such a result also shows us that the younger generation is fed unhealthy. In parallel with the results of their study, Mustafaoğlu, Zirek, Yasacı, and Özdinçler (2018) state that those who allocate more time to digital games face weight problems due to adoption of a sedentary lifestyle. In his study, Horzum (2011) was able to make obese and overweight individuals control their weights with the help of games with body motion.

In Turkey, Çiçek (2019) has investigated the problems of the young in digital gaming addiction for the first time within school health practices by the OMAHA system (one of 12 classification terminologies accepted by the American Nurses Association). Accordingly, the most identified seven problems of the young at risk are mental health problems, visual impairment, pain, sleep disorders, nutritional disorders, decreased social interaction, and physical activity.

In the other finding of the study, significant differences were found between the subscales of Cognitive and Affective of the DGAS and the Physical Development subscale of the Sports Attitude Scale, and between the Behavioral subscale of the DGAS and the Mental Development subscale of the Sports Attitude Scale. Accordingly, it was found that there was a negative low significant difference between the subscales of Cognitive and Affective of the DGAS and the Physical Development subscale of the Sports Attitude Scale. Therefore, it can be said that the level of physical development of individuals increases with the improvement in their gaming knowledge and feelings such as love and hate, which is why the participants' attitudes towards sports decrease due to their increasing interest and attitudes towards digital games. In parallel with the current study, in a study conducted by Demir and Cicioğlu (2019) on high school students, it was found that as the motivation of gaming increased, the motivation to participate in physical activity decreased. Nevertheless, Hazar, Demir, Namlı, and Türkeli (2017) did not find any significant difference between the digital gaming period and the physical activity level. Çakır (2013) stated that individuals are deprived of other activities due to the excessively time allocation to digital games. On the other hand, a negative low significant difference was found between the Behavioral subscale of the DGAS and the Mental Development subscale of the Sports Attitude Scale. Therefore, it can be said that as the time allocated to gaming and the level of researching digital games increases, participants' mental development levels decrease in sports. In this case, participants' gaming behaviors, following magazines and online news about digital games, and spending considerable time on such activities may cause a decrease in the level of mental development, which is critical for technical and tactical improvement

in sports. As a matter of fact, the interest in digital games increases, but participation in physical activities decreases due to the increasing urbanization, the parents' avoidance to send their children to the parks alone, and the traditional games' tending to be forgotten (Demir & Cicioğlu, 2019; Postman, 1995). In addition, the decrease in the participation of the young in physical activities can be shown as the reason for increasing preferences for digital games that have many adverse psychological and physical effects (Demir & Cicioğlu, 2019; Kırcaburun et al., 2018).

As a result of the analysis performed to determine the relationship between the subscales of the Sports Attitude Scale and the DGAS by the gender variable, significant differences were found between the subscales of the DGAS, but there was no significant difference between the subscales of the Sports Attitude Scale. Therefore, it can be argued that male and female participants have similar attitudes towards sports. Such a result can be attributed to the fact that men and women do similar sports and take advantage of the factors that form sports. In the study conducted by Türkmen, Abdurahimoğlu, Varol, & Gökdağ, (2016) with the students of the faculty of Islamic sciences, it was found that the attitudes of male students towards sports were higher than of female students. Unlike the results of the present study, in the study conducted by Kaya, Cicioğlu, & Demir, (2018) on university students, it was found that the attitudes of male students towards sports were higher than of female students. In a study conducted with disabled athletes, Demir and İlhan (2019) did not find any significant difference between females' and males' motivation to participate in sports. On the other hand, a significant difference was found between the gender variable and the participants' mean scores on the subscales of Cognitive, Affective, and Behavioral. According to the results, it was observed that the mean scores of males were significantly higher than of females. This is because girls do not spend time on digital games since they are more home-loving and emotional and have more communication with the social environment. Besides, boys are more affected by cognitive factors such as knowing digital games; emotional factors such as enjoyment, excitement, and happiness; and behavioral factors such as playing digital games, and following magazines and online news about digital games. As a matter of fact, according to Griffiths and Davies (2005), the reasons that boost males to play games more than females are that the games are generally produced in accordance with the interests of males, and therefore contain mostly masculine images, males are more successful in gaming, and males are likely to keep gaming thanks a relatively higher success in gaming. In a study conducted by Demir and Cicioğlu (2019) to examine high school students' motivation for digital gaming, it was found that male participants had higher motivation to play digital games than females. In parallel with our study, Ferguson and Olson (2014) and Keser and Esgi (2012) found that male participants played digital games more than female participants. In a similar study, Gökçearslan and Günbatar (2012) stated that male students had higher scores on digital game addiction than female students.

As a result of the analysis conducted to determine the differences between the subscales of the DGAS and the Sports Attitude Scale by the BMI variable, another sub-problem of the study, no significant difference was found between participants' BMI values and the DGAS. Accordingly, it can be said that attitudes towards digital gaming do not correlate with body mass indexes of the participants. In contrast to the results of the present study, it has been previously found that individuals spend a large part of the day in indoor spaces thanks to the development of technology, and disappearance of traditional street games and playgrounds due to rapid urbanization have increased BMI values of people (Çakır, 2019; Demir & Bozkurt, 2019; Kaya, 2013; Kıran, 2011; Horzum, Ayas & Çakırbalta, 2008). Significant differences were found between the subscales of Psychosocial Development, Physical Development, and Mental Development by the BMI variable. Therefore, the mean scores of normal-weight participants were found to be significantly higher than of lean, overweight, and obese participants on the Psychosocial Development subscale. Besides, it was found the mean sores of normal-weight participants were significantly higher than of lean, obese, and overweight participants on the Physical Development sub-scale. On the Mental Development subscale, the mean scores of normal-weight participants were significantly higher than of lean, overweight, and obese participants. These results reveal that normal-weight participants have higher attitudes towards sports than other groups. Çakır (2019) examined the relationship between high school students' motivation to participate in physical activities and body mass indexes and found that enthusiasm, excitement, desire, and enjoyment levels of obese students to participate in physical activities were significantly lower than of others.

In the study, it was sought whether there were any differences between the subscales of the DGAS and the Sports Attitude Scale by the participants' daily gaming periods. Accordingly, there was no significant difference between the scores on the Sports Attitude Scale by the variable of daily gaming period, which infers that the differences in gaming periods are not related to the attitude towards sports. Unlike the results of the present study, Demir and Cicioğlu (2019) found that the increase in the gaming period decreased the level of participation in physical activity. In their study carried out with high school students, Demirel, Cicioğlu, & Demir, (2019) found that students who participated less in physical activities participated more in digital games.

In addition, significant differences were found in the subscales of Cognitive, Affective and Behavioral of the DGAS by the variable of daily gaming period. Therefore, it was found that the mean scores of those spending 91-120 min. a day for gaming were significantly higher than of those spending 120 min. and over, 61-90 min., and 30-60 min. on the Cognitive subscale. Such a result implies that participants who play digital games 91-120 min. a day have higher levels of knowledge for gaming, and commentary skills on digital games. On the Affective subscale, the mean scores of those spending 120 min. and over a day for gaming were found to be significantly higher than of those spending 61-90 min., 91-120 min., and 30- 60 min. Therefore, it can be said that those who play digital games 120 min. and over a day experience better motivation, excitement, comprehension, and learning processes pertaining to digital game world. Finally, the mean scores of those spending 91-120 min. a day for gaming were found to be significantly higher than of those spending 120 min. and over, 61-90 min., and 30- 60 min. on the Behavioral subscale. Hence, those who play digital games 91-120 min. a day are said to be more effective in shaping their gaming-oriented behaviors and gaining diverse experience. Considering that there are three elements of attitudes, such as cognitive, affective, and behavioral, and there is a dynamic relationship between these elements (Tavşancıl, 2002), it can be asserted that the participants' attitudes towards digital gaming are strong.

Moreover, results revealed that the mean scores of the participants doing sports 120 min. and over a day were found to be significantly higher than of those doing sports 61-90 min., and 30-60 min. on the Behavioral subscale. Besides, the mean scores of the participants doing sports 120 min. and over a day were found to be significantly higher than of those doing sports 91-120 min., 30-60 min., and 61 -90 min. on the Psychosocial Development subscale. It was also found that the mean scores of the participants doing sports 91-120 min. a day were significantly higher than of those doing sports 61-90 min., and 120 min. and over on the Physical Development subscale. Although the mean scores of participants doing sports 120 min. and over a day are significantly higher than of other groups in one each subscale of the two scales, it was observed that those doing sports 91-120 min. a day had higher attitude scores than others. It can be argued that long-term and regular sporting affects positively the attitudes towards sport in terms of cognitive, affective and behavioral aspects. Kaya et al., (2018) stated that the attitudes of those, who do regular sports, to sports are significantly higher than those who do not. There are also studies with similar results in the literature (Alparslan, 2008; Cox et al., 2008; Güllü, 2007; Singh & Devi 2013).

The last finding of the study revealed that the mean scores of those playing in a sports club are significantly higher than of the mean scores of those who do not on the Cognitive and Affective subscales, which is thought to stem from the fact that knowledge levels, emotional approaches, and attitudes of those who play in a sports club are more evident and that they play digital games specific to their branches.

In addition, it was concluded that, on the Mental Development subscale, the mean scores of those who play in a sports club were significantly higher than of those who do not. Therefore, it can be stated that the mental skills of the players who play in a sports club, such as immediate decision-making and tactics development, are more solid than those who do not. This may be due to the fact that those who do regular sports in a club spend more time in sports activities and that they use mental processes effectively in sports. Previous studies (Saygılı, Atay, Eraslan & Hekim, 2015; Filiz & Demirhan, 2018) reveal that the levels of academic achievement of people who do regular sports are higher than those who do not do sports.

To sum, the increase in the attitudes towards digital gaming decreases the attitudes towards sports. It is an indisputable conclusion that playing digital games responsibly contributes to the development of students in some areas. However, the students should be informed about the fact that digital games containing physical activities will increase such a contribution to their mental and physical developments.

This research was conducted on a specific sample of high school students. Expanding the research and increasing the number of samples, identifying the game preferences of students and determining their psychological effects, and increasing the diversity by taking samples from middle school and university students are among the recommendations of the researchers.

REFERENCES

Adams, E. & Rollings, A. (2014). *Fundamentals of Game Design*. (3.Baskı). Prentice Hall, s.67-81.

Akçay, D. & Özcebe, H. (2012). Okul Öncesi Eğitim Alan Çocukların ve Ailelerinin Bilgisayar Oyunu Oynama Alışkanlıklarının Değerlendirilmesi. *Çocuk Dergisi, 12*(2), 66-71. doi:10.5222/j.child.2012.066

Allahverdipour, H., Bazargan, M., Farhadinasab, A., & Moeini, B. (2010). Correlates of video games playing among adolescents in an Islamic country. *BMC public health*, *10*(1), 286. Retrieved from; https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2894772/

Alparslan, S. (2008). Ortaöğretim öğrencilerinin beden eğitimi öğretmenlerinin sergilediği öğretim davranışlarına ilişkin algıları ve öğrencilerin bu derse karşı geliştirdikleri tutumları. *Yüksek Lisans Tezi.* Abant İzzet Baysal Üniversitesi, Bolu.

Aydoğdu-Karaaslan, İ. (2015). Dijital Oyunlar ve Dijital Şiddet Farkındalığı: Ebeveyn ve Çocuklar Üzerinde Yapılan Karşılaştırmalı Bir Analiz. *Uluslararası Sosyal Araştırmalar Dergisi. The Journal of International Social Research*, 8(36), 806-818. Retrieved from; http://sosyalarastirmalar.com/cilt8/sayi36_pdf/7isletme_iktisat_iletisim_kamu/aydogdukaraaslan_ilknur.pdf

Bozkurt, H., Özer, S., Şahin, S. & Sönmezgöz, E. (2018). Internet Use Patterns and Internet Addiction in Children and Adolescents with Obesity. *Pediatric Obesity*, 13, 301-306. https://doi.org/10.1111/ijpo.12216.

Cox, A. E., Williams, L. & Smith, A. L. (2008). Change in Physical Education Motivation and Physical Activity Behavior During Middle School. Illinois State University, School of Kinesiology and Recreation, *Journal Of Adolescent Health*, 43(5), 506-513.USA. https://doi.org/10.1016/j.jadohealth.2008.04.020

Çakır, H. (2013). Bilgisayar Oyunlarına İlişkin Ailelerin Görüşleri Ve Öğrenci Üzerindeki Etkilerinin Belirlenmesi, *Mersin Üniversitesi Eğitim Fakültesi Dergisi*, 9 (2), 138-150. Retrieved from; https://dergipark.org.tr/tr/pub/mersinefd/issue/17383/181584

Çakir, E. (2019). Lise Öğrencilerinin Fiziksel Aktiviteye Katilim Motivasyonlari İle Vücut Kitle İndeksi Arasindaki İlişkinin İncelenmesi. *Beden Eğitimi ve Spor Bilimleri Dergisi,* 21(1-A),30-39.Retrieved from; https://dergipark.org.tr/tr/pub/ataunibesyo/issue/44153/528907.

Demir, G. T., & Bozkurt, T. M. (2019). Dijital Oyun Oynama Tutumu Ölçeği (Dootö): Geçerlik Ve Güvenirlik Çalışması. *Sportif Bakış: Spor ve Eğitim Bilimleri Dergisi*, 6(1), 1-18. Retrieved from https://dergipark.org.tr/tr/pub/sbsebd/issue/44966/492076.

Demir, G. T., & Cicioğlu, H. İ. (2019). Fiziksel Aktiviteye Katılım Motivasyonu İle Dijital Oyun Oynama Motivasyonu Arasındaki İlişkinin İncelenmesi. *Spormetre Beden Eğitimi Ve Spor Bilimleri Dergisi*, 17(3), 23-34. https://doi.org/10.33689/spormetre.522609

Demir, G. T., & Hazar, Z. (2018). Dijital Oyun Oynama Motivasyonu Ölçeği (Doomö): Geçerlik ve Güvenirlik Çalışması1. *Journal Of Physical Education & Sports Science/Beden Egitimi ve Spor Bilimleri Dergisi*, 12(2). Retrieved from: http://dergi.ohu.edu.tr/index.php/besyodergi/article/view/1841

Demir, G. T., & İlhan, E. L. (2019). Spora Katılım Motivasyonu: Görme Engelli Sporcular Üzerine Bir Araştırma. *Gaziantep Üniversitesi Spor Bilimleri Dergisi*, *4*(1), 157-170. https://doi.org/10.31680/gaunjss.525455

Demirel, H. G., Cicioğlu, H. İ., & Demir, G. T. (2019). Lise Öğrencilerinin Dijital Oyun Oynama Motivasyonu Düzeylerinin İncelenmesi. Beden Eğitimi Ve Spor Bilimleri Dergisi, 21(3), 128-137. https://dergipark.org.tr/en/pub/ataunibesyo/issue/48912/614554

Entertainment Software Association (2013) *Essential Facts About Computer and Video Industry 2012*. Washington D.C, USA: Entertainment Software Association.

Erboy, E. (2010). İlköğretim 4. ve 5. Sınıf Öğrencilerinin Bilgisayar Oyun Bağımlılığına Etki Eden Faktörler. *Yüksek Lisans Tezi*, Adnan Menderes Üniversitesi Sosyal Bilimler Enstitüsü, Aydın.

Filiz, B. & Demirhan, G. (2018). Akademik ve Spor Başarı Motivasyonu Arasındaki Ilişkinin Incelenmesi. *SPORMETRE Beden Eğitimi ve Spor Bilimleri Dergisi*, 16 (2), 138-152. DOI: 10.1501/Sporm_0000000361

Gentile DA (2009). Pathological Video Game Use Among Youth 8 To 18: A National Study. *Psychological Science.* 20:594-602. https://journals.sagepub.com/doi/pdf/10.1111/j.1467-9280.2009.02340.x

Gökçearslan, Ş,& Durakoğlu, A . (2014). Ortaokul Öğrencilerinin Bilgisayar Oyunu Bağımlılık Düzeylerinin Çeşitli Değişkenlere Göre İncelenmesi. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi* , (23) , 419-435 . Retrieved from https://dergipark.org.tr/tr/pub/zgefd/issue/47938/606448

Gökçearslan, Ş. & Günbatar, M. S. (2012). Ortaöğrenim Öğrencilerinde İnternet Bağımlılığı. *Eğitim Teknolojisi Kuram ve Uygulama Dergisi*, 2, 10-12. Retrieved from https://dergipark.org.tr/tr/pub/etku/issue/6271/84223

Greenberg, B. S., Sherry, J., Lachlan, K., Lucas, K., & Holmstrom, A. (2010). Orientations to video games among gender and age groups. *Simulation & Gaming*, 41(2), 238-259. https://doi.org/10.1177/1046878108319930

Griffiths MD. & Meredith, A. (2009). Videogame addiction and its treatment. *Journal of Contemporary Psychotherapy*, 39:247–253. https://doi.org/10.1007/s10879-009-9118-4

Griffiths, M.D. & Davies, M.N.O. (2005). *Videogameaddiction: Doesıtexist?* Handbook Of Computer Game Studies. J. Goldstein, J. Raessens (Eds), Boston. Mıt Pres, 359–368.

Güllü, M. (2007). Ortaöğretim öğrencilerinin beden eğitimi dersine ilişkin tutumlarının araştırılması. Yayımlanmamış Doktora Tezi. Gazi Üniversitesi Eğitim Bilimleri Enstitüsü Beden Eğitimi ve Spor Öğretmenliği Anabilim Dalı, Ankara

Hagström, D., & Kaldo, V. (2014). Escapism Among Players of Mmorpgs-Conceptual Clarification, Its Relation to Mental Health Factors, and Development of A New Measure. *Cyberpsychology, Behavior, and Social Networking*, 17(1), 19-25. doi: 10.1089/cyber.2012.0222

Hazar, Z. (2018). *Çağın Vebası Dijital Oyun Bağımlılığı ve Başa Çıkma Yöntemleri*. Gazi Kitabevi, Ankara.

Hazar, Z., & Hazar, M. (2017). Digital Game Addiction Scale for Children<p>Çocuklar İçin Dijital Oyun Bağımlılığı Ölçeği. *Journal of Human Sciences*, 14(1), 203-216. Retrieved from; https://www.j-humansciences.com/ojs/index.php/IJHS/article/view/4387

Hazar, Z., Demir, G.,Namlı, S., & Türkeli, A. (2017). Ortaokul Öğrencilerinin Dijital Oyun Bağımlılığı Ve Fiziksel Aktivite Düzeyleri Arasındaki İlşkinin İncelenmesi. *Niğde Üniversitesi Beden Eğitimi ve Spor Bilimleri Dergisi*, 11(3), 320-332. Retrieved from; http://dergi.ohu.edu.tr/index.php/besyodergi/article/view/1707

Horzum, M. B. (2011). İlköğretim Öğrencilerinin Bilgisayar Oyunu Bağımlılık Düzeylerinin Çeşitli Değişkenlere Göre İncelenmesi. *Eğitim ve Bilim Dergisi*, 36(159), 56-68. Retrieved from; http://egitimvebilim.ted.org.tr/index.php/EB/article/view/268

Horzum, M. B., Ayas, T. & Çakırbalta, Ö. (2008). Çocuklar İçin Bilgisayar Oyun Bağımlılığı Ölçeği. *Türk Psikolojik Danışma ve Rehberlik Dergisi*, 3(30), 76-88. Retrieved from; http://www.turkpdrdergisi.com/index.php/pdr/article/view/248

Kat, H. (2009). Bireysel Sporcularla Takım Sporcularının Stres Düzeyleri ve Problem Çözme Becerilerinin Karşılaştırılması. Yayımlanmamış Yüksek Lisans Tezi, Kayseri: Erciyes Üniversitesi Sağlık Bilimleri Enstitüsü.

Karasar, N. (2009). *Research Method.* Ankara: Nobel Yayıncılık.

Kaya, B. A. (2013). Çevrimiçi Oyun Bağımlılığı Ölçeğinin Geliştirilmesi. *Yüksek Lisans Tezi*, Gaziosmanpaşa Üniversitesi Eğitim Bilimleri Enstitüsü, Tokat.

Kaya, Ö., Cicioğlu, H. İ. & Demir, G. T. (2018). The Attıtudes of Unıversıty Students Towards Sports: Attıtude and Metaphorıcal Perceptıon. European Journal Of Physical Education And Sport Science, 5(1), 115-133. https://doi.org/10.5281/zenodo.1593401

Keser, H., & Esgi, N. (2012). An Analysis of Self-Perceptions of Elementary School Students in Terms of Computer Game Addiction. Procedia - *Social and Behavioral Sciences*, 46, 247–251. https://doi.org/10.1016/j.sbspro.2012.05.101

Kıran, Ö. (2011). Şiddet İçeren Bilgisayar Oyunlarının Ortaöğretim Gençliği Üzerindeki Etkileri. *Yüksek Lisans Tezi*, Ondokuzmayıs Üniversitesi Sosyal Bilimleri Enstitüsü, Samsun

Kırcaburun, K., Kokkinos, C. M., Demetrovics, Z., Király, O., Griffiths, M. D., & Çolak, T. S. (2018). Problematic Online Behaviors Among Adolescents and Emerging Adults: Associations Between Cyberbullying Perpetration, Problematic Social Media Use, and Psychosocial Factors. *International Journal of Mental Health And Addiction*, 1-18. https://doi.org/10.1007/s11469-018-9894-8

Koçak, F. (2014). Üniversite Öğrencilerinin Spora Yönelik Tutumları: Bir Ölçek Geliştirme Çalışması, *Spormetre, Beden Eğitimi ve Spor Bilimleri Dergisi,* 12 (1), 59-69. https://doi.org/10.1501/Sporm_0000000254

Ferguson, C. J., & Olson, C. K. (2014). Video Game Violence Use Among "Vulnerable" Populations: The İmpact of Violent Games On Delinquency and Bullying Among Children With Clinically Elevated Depression or Attention Deficit Symptoms. *Journal of Youth and Adolescence*, *43*(1), 127-136. https://doi.org/10.1007/s10964-013-9986-5.

Mustafaoğlu, R., & Yasacı, Z. (2018). Dijital oyun oynamanın c□ocukların ruhsal ve fiziksel sağlığı üzerine olumsuz etkileri. *Bağımlılık Dergisi,* 19 (3), 51-58. Retrieved from https://dergipark.org.tr/tr/pub/bagimli/issue/38282/447021

Mustafaoğlu, R., Zirek, E., Yasacı, Z., & Özdinçler, A. R. (2018). Dijital teknoloji kullanımının çocukların gelişimi ve sağlığı üzerine olumsuz etkileri. *Addicta: The Turkish Journal on Addictions*, *5*(2), 1-21. http://dx.doi.org/10.15805/addicta.2018.5.2.0051

Önder, Ç., (2019). İnternet Ve Dijital Oyun Bağımlılığı Açısından Riskli Adolesanların Sağlık Sorunlarının Omaha Sistemi ile Değerlendirilmesi. *Yüksek Lisans Tezi*. İstanbul Üniversitesi-Cerrahpaşa. Halk Sağlığı Hemşireliği Anabilim Dalı. Halk Sağlığı Hemşireliği Bilim Dalı. İstanbul.

Park, S. (2014). Associations of Physical Activity with Sleep Satisfaction, Perceived Stress, and Problematic Internet Use In Korean Adolescents. *BMC Public Health*, 14, 1143. https://doi.org/10.1186/1471-2458-14-1143

Postman, N. (1995). *Çocukluğun Yokoluşu*, (çev. Kemal İnal) İmge Kitabevi, İstanbul

Przybylski, A. K., Weinstein, N., Murrayama, K., Lynch, M. F. & Ryan, R. M. (2011), The İdeal Self At Play: The Appeal of Video Games That Let You Be All You Can Be. *Psychological Science*, 23 69–76. https://doi.org/10.1177/0956797611418676

Rideout V.J., Foehr U.G. & Roberts D.F. (2010). Generation M2: Media in the lives of 8- to 18- year olds. *Kaiser Family Foundation*. Retrieved from; http://www.kff.org/entmedia/entmedia012010nr.com

Saygılı, G., Atay, E., Eraslan, M., & Hekim, M. (2015). Düzenli Olarak Spor Yapan ve Yapmayan Öğrencilerin Kişilik Özellikleri ile Akademik Başarıları Arasındaki İlişkinin İncelenmesi. *Kastamonu Eğitim Dergisi,* 23 (1), 161-170. Retrieved from; https://dergipark.org.tr/tr/pub/kefdergi/issue/22600/241454

Singh R. K. C. & Devi KS. (2013). Attitude of higher secondary level student towards games and sports, *International Journal of Physical Education, Fitness and Sports, 2*(4), 80-85. https://doi.org/10.26524/13421

Snodgrass J.; Lacy M.; Dengah F.; Fagan J., & Most D. (2011). Magical Flight and Monstrous Stress: Technologies of Absorption and Mental Wellness in Azeroth, *Culture, Medicine and Psychiatry,* 35(1), 26-62. https://doi.org/10.1007/s11013-010-9197-4

Şahin, C. & Tuğrul, M. (2012). İlköğretim Öğrencilerinin Bilgisayar Oyunu Bağımlılık Düzeylerinin İncelenmesi. *Zeitschrift für die Welt der Türken-Journal of World of Turks*, 4(3), 15-30. Retrieved from; https://www.guvenliweb.org.tr/dosya/XZnOE.pdf

Şentürk, E. Ş. (2012). Spora Yönelik Tutum Ölçeği: Geliştirilmesi, Geçerliliği ve Güvenirliği, *CBÜ Beden Eğitimi ve Spor Bilimleri Dergisi*, 7(2), 8-18. Retrieved from https://dergipark.org.tr/tr/pub/cbubesbd/issue/32237/357821

Tarhan, N. & Nurmedov, S.(2011). *Bağımlılık, Sanal veya Gerçek" Alkol ve Madde Bağımlılığı*. İstanbul: Timaş Yayınları.

Tavşancıl, E. (2002). *Tutumların Ölçülmesi ve SPSS ile Veri Analizi*. Nobel Yayıncılık, Ankara.

Toran M, Ulusoy Z, Aydin B, Deveci T, & Akbulut A. (2016). Çocuklarin dijital oyun kullanimina ilişkin annelerin görüşlerinin değerlendirilmesi. *Kastamonu Education Journal.* 24(5) :2263-2278. Retrieved from; https://kefdergi.kastamonu.edu.tr/index.php/Kefdergi/article/view/1391

Torun, F., Akçay, A. & Çoklar, A. N. (2015). Bilgisayar Oyunlarının Ortaokul Öğrencilerinin Akademik Davranış ve Sosyal Yaşam Üzerine Etkilerinin İncelenmesi. *Karaelmas Journal of Educational Sciences*, 3(15), 25-35. Retrieved from; http://ebd.beun.edu.tr/index.php/KEBD/article/view/47/76

Türkmen, M., Abdurahimoğlu, Y., Varol, S. & Gökdağ, M. (2016). İslami ilimler fakültesi öğrencilerinin spora yönelik tutumlarının incelenmesi (Bartın Üniversitesi örneği), *International Journal of Contemporary Educational Studies (IntJCES)*, 2(1), 48-59. Retrieved from; https://dergipark.org.tr/tr/pub/intjces/issue/25669/270727

Tüzün, Ü. (2002). Gelişen İletişim Araçlarının Çocuk ve Gençlerin Etkileşimi Üzerine Etkisi. *Düşünen Adam,* 15(1), 46-50. Retrieved from; http://www.dusunenadamdergisi.com/ing/DergiPdf/DUSUNEN_ADAM_DERGISI_529f837ed577455db8e09942aabe2e90.pdf

Wolfe, J., Kar, K., Perry, A., Reynolds, C., Gradisar, M., & Short, M. A. (2014). Single Night Video-Game Use Leads to Sleep Loss and Attention Deficits in Older Adolescents. *Journal of Adolescence*, 37,1003-1009. https://doi.org/10.1016/j.adolescence.2014.07.013

Yavaş, M. ve İlhan, A. (1996). *Beden Eğitimi ve Sporda Özel Öğretim Yöntemleri*. Bursa: Melisa Matbaacılık.

Yıldırım D. A., Yıldırım, E., Ramazanoğlu, F., Uçar, Ü., Tuzcuoğulları, Ö. T. & Demirel, E. T. (2006). Üniversite Öğrencilerinin Spora Bakış Açıları ve Spor Yapma Durumu, Doğu Anadolu Araştırmaları, 4(3), 49-53. Retrieved from; https://dergipark.org.tr/tr/pub/fudad/issue/47088/592217

Training Pre-Service English Language Teachers with 3-D Machinima

Tuncer CAN
English Language Teaching Department, Hasan Ali Yücel Faculty of Education, Istanbul University – Cerrahpaşa, Turkey
tcan@istanbul.edu.tr

ABSTRACT
Training foreign language teachers for 21st century requires the consideration of digital skills as well as the change of focus from more structural foreign language instruction to more discourse oriented foreign language instruction. In this context, pre-service language teachers need to learn language teaching methodology and instructional technologies likewise. Thus, when those pre-service language teachers start their careers in classrooms, they could function effectively and could bring diversity for their learners. In this study, the aim is to introduce pre-service language teachers with 3D Virtual Learning Environments where they can produce their 3D digital narratives that could also be labeled as Machinima. Some 89 prospective teachers attended the activities around this study, who were later evaluated by triangulated data collection methods of both quantitative and qualitative nature, such as reflective essays, questionnaires and semi-structured interviews. Those teachers mainly reported positive experience views with the end-product machinima like having learnt another perspective for language instruction, gaining self confidence for their prospective job, learning about a useful tool which they can utilize as a compensation in their teaching. However, they also reported some problems like technical issues that hindered the production of their group machinima.

Keywords: machinima, teacher training,

INTRODUCTION
Foreign language teachers of the 21st century need to understand that structure based instruction needs to be replaced by more discourse oriented foreign language instruction (Canagarajah, 2005). This methodological upheaval in foreign language field could be enhanced by integrating technology. Thus, when those pre-service language teachers start their careers in real classrooms they could function effectively and could bring diversity into their classrooms for their learners. Given the hours the in-service teachers teach and other matters like lesson preparation and evaluation, namely the workload should make it very difficult for those teachers to learn new skills. However, new skills are actually needed for the changing nature of learners and other teaching materials. So to say, it is easier to learn and be equipped with new skills while those individuals are still at universities. In this respect, pre-service language teachers should learn new language teaching methodologies and instructional technologies likewise. In this context, this study aims at introducing pre-service English language teachers with 3-D immersive virtual worlds and machinima, thus train them for 21st century skills that they will need to implement in their professional lives.

Theoretical Background
The word "machinima" is a neologism derived from combining the words "machine" and "cinema" in 1999 by Anthony Bailey. Machinima stems from the creative productions of videogame players, in particular by using a software feature called "demo recording" (which was developed by id Software and was available for the videogames *Quake* and *Doom*) that enabled the user to record sequences of game action (Hancock & Ingram 2007, p. 12) These movies then became more elaborated and were shot from the player´s perspective. Development in 3D engine software technology, new games with more sophisticated graphical environments and the increase in the processing power of PC´s and affordable *professional grade video editing software* have opened the doors of what is possible today in creating, record and edit machinima (Morozov, 2008, p. 5902). Current machinima making tools can create models of objects or places from scratch. These tools enable custom scripting of object behavior and allow anyone to sit in a virtual director's chair.

Technology enhanced learning environments like Second Life (SL) are user-centered systems that enable multiple simultaneous participants, represented by an avatar (the realistic animated virtual body that is provided) to participate in virtual experiences "*that incorporate modelling and mentoring about problems similar to those in real world contexts*" (Dede 2004). 3D VLEs are created to represent a place, or event to help understand a certain topic, incident or time period. They provide an ideal platform for the types of activities that "*epitomize dynamic, active engagement.... and have the ability to leverage aspects of authentic learner conditions that are hard to cultivate in traditional classroom settings*" (Dieterle & Clarke, cited from Muldoon & Kofoed, 2009, p.

2244). 3D VLEs allow educators to immerse their learners into the subject matter (Wilson, 2011). Machinima production in the virtual environment Second Life (SL) results in objects that have an asynchronous value. The lessons in SL could enable students to learn "procedural language, problem solving, discussion, social pragmatics, storytelling, and code-switching between different genres of writing" (Lansiquot & Rosalia 2008, p. 2661).

The multi-user virtual world "Second Life" offers the freedom to "*customize sets, props and camera angles that can be found in in SL*" (Middleton 2008, p. 207). Second Life "*… offers a range of functionality that makes it better suited than either "pure gamers" or "pure machinima" platforms for machinima development in games as The Sims. Key activities to be performed in SL are collaborative groups role-play, using paper-slip stories and point of view activities"* (Lansiquot & Rosalia 2008, p. 2661) and theme based instruction (not just necessary conventional step-by-step lessons).

Middleton (2008, p. 216) defines Machinima as "s*elf-contained, highly granular digital videos*". Machinima are *digital visual narratives* that are produced by real-filmmaking techniques in a studio-like environment (mostly in an interactive and immersive 3-D multi-user virtual world) where software tools and resources are available to help to develop original digital content. Machinima are able to "*represent any conceivable object or sequence or event, while incorporating rich narrative structures, as well as graphical and text-based content, using visual and aural modalities (through images, music subtitles and voice-overs)*" (Morozov 2008, p. 9). Machinima, whether they are seen as new media genre, a form of digital literacy or semiotic (symbolic, representational) domain, can be seen as a medium of creative expression where "anybody can record and edit unique visual experiences incorporating 3D character models and objects, set designs, graphical textures, camera angles, special effects, weather filters, custom lighting, ... with unlimited variations on plot, settings, and characters (Morozov, 2008 p. 5899).

According to Kelland, Morris and Lloyd 2005 (pp. 72-94), the four most common machinima production techniques are: "*straight recording", the "puppetry approach", "recamming" and "scripting"*. The first one is merely recording the activities of the avatars. The second one entails manipulation of avatars to perform actions based on a screenplay. Recamming is based on puppetry approach as re-recording the actions by adding additional avatars, changing lights or moving cameras. Scripting is programming avatars to perform in specific ways.

Furthermore, machinima is related to a number of other *semiotic domains* like videogame, filmmaking and animation. Gee (2003) defined semiotic domains as "*any sets of practices that recruits one or more modalities (e.g. oral or written language, images, equations, symbols, sounds, gestures graphs, artifacts, etc. to communicate different types of meanings*" (in Morozov, 2008, p. 5901). To analyse engagement with machinima, it is useful to apply a set of characteristics of effective learning of a given semiotic domain. Originally developed for video games, 4 characteristics can be formulated:

1. Learning and experience the world (see and act on) in a new way
2. The potential to join and collaborate with a new affinity group
3. Developing resources for future learning and problem solving in the semiotic domains to which the game is related
4. Learning how to think about semiotic domains as design spaces that engage and manipulate people in certain ways and, in turn, help create certain relationships in society among people and groups of people, some which have important implications for social justice (cf. Morozov, 2008, p. 5902).

Viewed as a *semiotic symbolic representational domain* machinima could be used to develop digital literacy, as well as 21st century literacy. Machinima could enhance new ways for language instructors to create their own learning materials. Machinima could be used for training teachers to teach in contexts which often lack multimedia materials for instruction. Machinima can be created and integrated with other media for as little as human preparation as well as effort. Furthermore, it can be used for attainment of fluency by enabling the visualization of cohesion and rhetorical organization as much as grammar and vocabulary.

Machinima is seen by some researchers already as *stand-alone* medium that can be used as medium for original creative and communication by users (Mozorov 2008, Lansiquot & Rosalia 2008, Koenraad et al. 2013). Machinima has no bearing to be considered as an off-beat videogame feature used only for amusement and beyond that, learning with Machinima goes beyond from conventional *form focus issues* and *memorization support* (vocabulary, language chunks and grammar patterns) that traditional computer mediated learning technologies provided. The digital technology of machinima facilitates to solve the educational dilemma

that "*the abstract knowledge taught in schools and university is not retrievable in real-life situations because traditional approaches (lectures and tutorials) ignore interdependence of situation and cognition"* (Herrington & Oliver 2000, p. 23, cited in Muldoon & Kofoed 2009, p. 2243). The technology of machinima facilitates "apprenticeship-style learning" in the classroom (Muldoon & Kofoed 2009, p. 2243). The characteristics of this learning model are: engagement in domain related practice, ownership of inquiry, coaching and modeling of thinking skills, collaborative and social learning, motivating learning context.

The results in applying machinima in various educational research and projects are encouraging and confirm some of the characteristics mentioned above:

- Muldoon & Kofoed (2009) state in their investigation with accounting education a "significantly increased level of engagement and active learning "(p.1)
- In the VITAAL Project it became apparent that "pupils were enthusiastic and they have noticed an increase in motivation, more time on asks, and less inhibition (Koenraad 2013, p. 3517)
- The NIFLAR project showed positive results, students reported as most positive points "increased confidence and less inhibitions when speaking and acquisition of cultural knowledge" (Koenraad 2013, p. 3520)
- The CAMELOT Project evaluation of the teacher training course with machninima revealed that "a positive course outcome was the sense of community developed during the training through collaborative engagement in the process of creating machinima, which was considered as most effective and rewarding. As a result, participants were eager to continue working in virtual environments and actively involve their learners in the process of creating machinima in future lessons." The process of achievement when producing a machinima, being part of the team, either filming or playing a role was considered as more important than the product itself, as the experience of active participation, fun and collaboration, which learners can recall, is essential if they are to learn effectively (Camelot Project, 2015). In terms of the evaluation in the end of the project, some teachers argued that they were were eager to apply the machinima they produced in their own teaching contexts, indicating that it gave them more control, as well as the ability to adapt them to the personal context of their learners (Thomas & Schneider, 2018, p. 7).
- Butler (2012) postulates that using Machninima in legal education not only engages students in active learning, but also facilitates flexibility in their studies and there are other benefits especially for those that rely on traditional passive lectures in their teaching and learning approaches.
- The research reported in the study of Muldoon & Kofoed, (2011) covers accounting education with machinima and reports that students appreciated the technology-enhanced learning environment, which resulted in significantly increased level of engagement and active learning. Findings revealed that the development of higher order thinking skills is best facilitated in authentic contexts that represent the values and practices of the discipline.
- Barwell, Moore & Walker (2011) report on the incorporation of "machinima", as part of an interdisciplinary and collaborative project where the focus is not on the mastery of the tools or the acquisition of predetermined knowledge in art education, but on the development of learning engagement.
- Middleton & Mather (2008) think that the educational value of Immersive Virtual Worlds (IVWs) seems to be in their social immersive qualities and as an accessible simulation technology. To them, student-generated production models the learning value may be found in the production process itself.
- Meyers (2014) presents that understanding *children's digital play in immersive virtual spaces*, specifically those with limited communication affordances, demands new methods and approaches that move beyond interviews and participant observation.
- Conkey's (2010) study addresses the effectiveness of machinima based *soft-skills education* using avatar actors versus the traditional video teaching application using human actors.
- Johnson & Runo (2011) did a study designed to show educators and others the potential of making machinima that moves beyond the mundane to a new level of *storytelling* that will captivate audiences, especially *students*.
- In his work, Harwood (2013) proposes that machinima is a *practice-based approach to learning digital creative practice*. He suggests that machinima is '*digital clay'* that has the potential to add value to p*ractice-based learning in a connected world.*

- In Hui-Chun Hsiao's (2013) view combining visual game scenes, actions and narrative, Machinima, a by-product of the digital game, has been seen as a *storytelling form of artistic expression and creation.*
- In her PhD thesis, Horlescu (2017) investigated the Technological Pedagogical Content Knowledge (TPACK) of language teachers who were engaged in the digital literacy practice of producing a multimodal ensemble with machinima. Her findings suggest that teachers possess digital literacies as they enact the affordances and overcome the constraints of digital technologies through synaesthesia, spontaneous improvising and coaction. (Horlescu, 2017 p. i)

As seen from the research and projects there is very little research on using Machinima in teacher education let alone foreign language teacher training. For teacher education the inclusion of computer mediated communication in voice-enabled multi-user 3D VW in networked interaction projects can be considered as a powerful experimental learning opportunity. The modern digital semiotic domain is a fertile ground for excellence for internationalization, collaboration and project learning. The digital semiotic domain of machinima possesses incredible potential for enabling effective learning experiences. It can enable the development of digital and 21st century literacy skills. The technology of machinima is growing up fast and can soon be mature enough to invade the mainstream environment, many already produced impressively designed and produced machinima on various scientific subjects illustrate the great promise for this new media genre.

Some negative effects of learning via machinima in VW are on the one hand the "*extraneous cognitive load*", thus risk of diverting focus of attention away from object of learning, on the other hand the insufficient network bandwidth and computational power to use the 3-D environment" (Lu 2011, p 671). Koenraad (2013) reported organizational problems (pupil online presence and teamwork) and technical issues (voice functionality, AW-interface skills)

THE STUDY

The Research Design

As the research design, the case study design, that is one of the qualitative research designs, was chosen as it is appropriate to the nature of the research. Case study is an empirical research method that studies a current phenomenon within its real life framework and examines situations in a multifaceted, systematic and in-depth manner (Yıldırım & Şimşek, 2005: 277; Patton, 1990: 384; Cohen and Manion, 1997: 106). Case study includes the following the stages: the limitation of the situation, determination of the research case, research the data set, the creation of findings, comments and writing the results (Denzin and Lincoln, 1996: 103; Bassey, 1999: 66). In the study, single nested case design, which is one of the case study patterns, was used. In this design, it is essential to approach more than one category in a single theme (Yıldırım & Şimşek, 2005: 291). In this study, "the use of machinima in foreign language teacher training" was examined by accessing the sub items of communication and forum records. The structural validity of case studies is ensured by the establishment of a chain of evidence on the data collected; its internal validity is made clear by presenting the results and presenting evidence of inferences in a form accessible to others; external validity is obtained by proposing a theory or conceptual model based on the results obtained; reliability is obtained by presenting the processes followed in the research clearly (Yıldırım & Şimşek, 2005: 288). In our study, evidence was provided by making excerpts from the data obtained from the use of machinima in foreign language teacher training and its validity was provided in this way; reliability was obtained by explaining the steps followed in our study in detail. One of the data collection techniques used in case studies is documents (Robson, 2001: 159). Machinima videos and the reflective essays used in our research are documents as well. Document analysis involves the analysis of written materials containing information about the facts and events that are intended to be investigated. It enables the analysis based on a broad time frame about the research problem, the creation of a large sample through access to various written materials, is superior in terms of the original recording of the data by the individual and not by the researcher (Yıldırım & Şimşek, 2005: 187-190). On the other hand, the availability of the material saves the process of data collection from the subjectivity of the researcher (Mayring, 2000: 36-37). The single nested case design that is one of the patterns of the case study design was chosen to elaborate on the students' views and see the impact of the machinima production on the pre-service foreign language teachers' development. In the search for solid data to observe the development of those in question the framework of qualitative research design proved valuable. The results constituted a rich data from which the conclusions could be drawn easily. Themes and their subsequent categories were distilled from the data set and they presented a meaningful link with the experience and the learning process that led to this study.

The classroom and school context

The study was conducted at a leading state university in Istanbul, Turkey. They study was implemented for a whole semestre during a Drama class offered at English Language Teaching Department.The ELT department has over 400 students of whom some 89 participated into the study. All of the students graduate to become foreign language teachers throughout Turkey. The students who took part in the study are junior students, in their 3rd year of study. They take up Drama class in their 5th semestre. The drama class is a 4 credit-hour class that consists of 2 theoretical and 2 application credits. The drama class met 2 times in a week as classes A and B; students from class A attended Wednesdays and class B attended on Fridays. During theoretical part of the lesson, the students were introduced to a historical survey of the genre Drama that included plays and information from antiquity to modern times. For the application part of the lesson students were introduced to the 3D virtual learning environments, avatars, video capture, recording and editing tools available in the market for free. Furthermore, the students were grouped on friendship basis to work on their productions during the application part each week. This engaged them to work on different aspect of the final product, the machinima, each week. They worked on screenplays, avatar costumes, background and recording designs, recording and adding sounds as well as their final production. Each group was expected to submit a final production machinima created in Second Life, a 3D virtual environment. The final project constituted 50% of the students' final course grade. Additionally, as part of the final project, participants were asked to write a reflection essay, fill in an online questionnaire, and some of the participants from different groups were asked to participate in a semi-structured interview regarding their experience on the 3D VLEs and their production. The study discussed in this paper focuses on examining the reflections and views of those pre-service teachers who collaboratively designed and produced a machinima on Second Life.

Participants

89 third-year prospective teachers enrolled in the course during the 2018-2019 fall semester. They were seperated into two classes, A and B depending on their students' ID numbers, being even or odd number. Among those, 21 groups, varying between 4 and 6 members in each group, were formed. For the final product machinima, each group was asked to determine a teaching objective, write a screenplay, choose avatars and costumes for their avatars, design the environment for recording, do the role-plays and recordinng, do the editing and add the music and sounds, and finally write a lesson plan based on their material. The study continued for 12 weeks from the introduction of the assignement until the final product. Hence, the potential participants of the current study were the members of the twenty-one groups (n=96) who were asked to reflect on their experience through a written reflection paper. However, the number of the final participants contained 89 prospective teachers in addition to those who did not provide reflections (n=7). Although these prospective teachers actively use Facebook for social networking purposes, at the time of the study they did not have any prior teaching experience on Facebook. Additionally, they had utilised the platform only to receive announcements in their previous two courses.

Procedures

The planning and implementation of the study continued for 12 weeks. In the first week, students were provided with an orientation on what they were supposed to do as a final product, the machinima genre and 3D VLEs, At the first week after the orientation they were asked to make groups on friendship basis. On the third week, the participants were asked to get familiar with 3D VLEs; for this the course instructor met the students online on Istanbul University Virtual Campus on Second Life, introduced them with the environment and the opportunities and helped with the avatar design and dressing the avatars. In the meantime, in the first four weeks of the lesson, in the theoretical part 3 plays were studied. Oedipus Rex by Sophocles, Medea by Europides and Macbeth by Shakespear. The learners were given also historical information on the genre and the drama traditions of Greeks and English. Thus the theoretical preparation of the learners on screenplays was ensured. Then the learners started working on their screenplays in their groups and this continued for another 2 weeks. After the study of two more plays A Doll's House by Ibsen and Waiting for Godot by Becket, the learners studied papers discussing the use of Drama texts in the classroom, material design and lesson planning with plays and drama based tasks at different language levels in the context of foreign language teaching. In accordance with this, the learners were asked to plan for their machinima production and its place in the foreign language learning. They learnt about recording software, editing software and sound adding solutions. In the eighth week they chose and designed the environment for their machinima, started doing their recordings, the editing and writing their lesson plans. The learners were given 3 weeks to complete. In the last, twelfth, week all the machinima were viewed during the lessons and were evaluated on the given criteria, as these final products constituted the %50 of their final course grade.

During the production stage, one of the lessons, on week 10, was conducted at the faculty computer lab where there were 40 desktop computers for student use, also wireless internet access for those with thier own laptops.

The instructor of the ELT department and 3 junior students from Computer Education and Instructional Technologies department helped with the technology, recording and editing. After the collection of all machinima, they were uploaded to a Youtube channel and a website was designed to publish all the production and lesson plans. The name of the website is "teacheranima.com" and the same name was used for the Youtube channel.

Qualitative data: Prospective teachers' reflective essays on their machinima production process

Reflection is an important tool for indicating learners thinking skills such as problem-solving, critical analysis, synthesising, determining patterns, and evaluation. Letting students immerse in their thinking and contemplate about their learning experience could help them realise what they have acquired during the learning process. The use of metacognitive strategies in learning also suggests that students must use self reflection as a tool to earn awareness and process on the learning itself and the process (Chamot et al., 1999). Our research aimed at exploring the reflections of prospective teachers who learnt how to teach by learning the 21st century digital skills as well through the proeduction of machinima. The pre-service language teachers were not provided with a structured format to generate their reflections. They were given only one guiding question that is *"What have you learnt from the machinima assignment?"*. We have collected 89 reflective essays, 74 online questionnaires and 12 semi-structured interviews.

Data analysis

The data that was obtained were analysed by thematic analysis which ensure the voice of the participants, epistemologically. Another aim is also to specify the experience and the meaning they make out of this expeience clearly (Braun & Clarke, 2006). For this study six-stage process recommended by Braun and Clarke (2006) for thematic analysis was used; first the entire data set was scanned various times by two researchers, with the eventual analysis involving familiarisation, generating and reviewing codes, searching for themes, and reviewing sub themes. The first phase for the review stage was to specify if all the coded extracts for a theme were coherent. The second criterion is the distinctiveness of each of the main themes and involves being capable of articulating what is the essence of each of the themes. Lastly, the codes that contributed to a theme were checked for internal consistency. After a considerable amount of recursive analysis, the main themes and their sub-themes were defined and named. In order to ensure the reliability of the collected data, two experts decoded 112 data selected among participants` reflections (89 in total) on their reflective essays.

For the analysis of qualitative data, the reflective essays were first recorded. The participants were given information about the research and their approval was obtained. After approval, the data was read several times and the first codings were made around the research question. Then the encodings were categorized according to similarities and differences. Similar categories were brought together to reach themes. In the second part of the analysis, seven themes and their categories and sub-categories were reached. Finally, the coding table was prepared in order to facilitate the analysis of the themes and categories and the data were analyzed again.

Limitations of the Study

Students who participated in the study were asked to communicate with the researcher were asked to do so by social media, however not all of the participants had social media accounts and from time to time communication was not as efficient. Forming the groups to produce machinima on friendship seemed viable in the beginning but after some time the groups had to be reformed as members of the groups would have hard time working with each other. The production of the machinima took longer for some groups as not all of the students had their own computers, and the computer lab of the faculty had to be arranged for them in the evening hours. This arrangement proved to be working but some students had problem with staying at school after working hours. The triangulation of the data seemed successful however the data was immense and having only two researchers to examine the data created great workload.

FINDINGS

After their experience with Machinima on 3-D VWs in their Drama Class the pre-service language teachers were asked the question "*What have you learnt from the Machinima Assignment?"* to obtain their views on their experience. The findings of the analysis of the reflective essays have been given in the following Table 1.

Theme	**Categories**
Experience	Good, hard, enjoyable, challenging but fun, awesome, nice, great, fabulous, best, wonderful, unforgettable, compelling but unforgettable, different, amusing, difficult, entertaining, valuable, important, very exciting, real, entertaining and informative.
Collaboration	Complicated and painful, useful, have good harmony, plays an important role, collective work, groupwork, good friends, a great pain, compromise, stronger

	relationship, work together, beneficial to work together, difficult to find time, proud of ourselves, proud of product, collective and mutual product, working in a group is really hard, responsibility.
Learning	Learnt a lot, relationship, materials design, contextual, learning by doing, many applications, Second Life, 3-D Virtual Environment, script writing, Camtasia, technical knowledge, editing, voicing, recording, new techniques, new perspectives, inductive, imagination, authentic, technical skills, digital literacy.
Technology	Complicated, many apps, technical problems: wifi, internet connection, computer, avatar, voice over, microphone, editing, sandboxes to build, places to record, recording and camera controls, time consuming, limitations like copyrights and money.
Professional Development	Self-efficacy, self-confidence, increase in motivation to be a good teacher, self-esteem, keep up with the new technology, educational material, expert on machinima, help in the occupation, enrich the materials and the lesson plans.
Resource	Limitless, task, helps learn a language, practice new language, teaching language, more effective way to transfer information, realia, authentic, contextualized way.
Creativity	Increases creativity, transform our feelings and thoughts into a creative –our worn-product, creative materials in the class.

Table 1. Analysis of the Reflective Essays Regarding Machinima

The analysis of the reflective essays revealed seven themes, these are: Experience, Collaboration, Learning, Technology, Professional Development, Resource and Creativity. Each theme was observed to be expressed within many categories. Each theme has also been linked to the categories in the Table 1.

Experience

The pre-service English teachers have agreed that the the experience they acquired in the process of making machinima was hard, challenging, different, difficult, compelling but on the other hand it was also good, enjoyable, fun, nice, great, fabulous, best, awesome, wonderful, unforgettable, amusing, entertaining, valuable, important, very exciting, real, entertaining and informative. Some marked that it was challenging but fun, and compelling but unforgettable. These comments indicate that the pre-service English teachers experienced some difficulty in the process but definitely had very good time while producing their machinima. The students asserted that producing machinima was an engaging experience.

- *In process of machinima, there were hard times but I do not remember any time as joyful as like that. (P1.)*
- *The whole experience made us proud and I am still watching sometimes without getting bored. (P2.)*
- *However, for our experience while trying to use it I can say that it was fun but at the same time challenging. (P3.)*
- *All in all, this process was both entertaining and also informative for all of us. (P4.)*

This is in line with the findings of Koenraad (2013), Butler, (2012) and Muldoon & Kofoed (2009) who have indicated that machinima provides engagement in domain related practice, ownership of inquiry and motivating learning context. The following examples are extracted from the reflections of the students and they represent both the theme and the categories summarized in Table 1.

Collaboration

Some of the students who reflected their opinions about the collaboration aspect of their task have indicated that the group work had been hard, complicated and painful, a great pain, and difficult to find time to work together. Yet some other revealed that it had been useful and beneficial to work together. Positive aspects that they indicated were that group work played an important role, it was a collective work, they made good friends and created stronger relationships in the process, they were proud of themselves and their mutual product as well as they learnt responsibility and how to compromise. These reflections can be verified with Morozov (2008), CAMELOT Project (2015) and Barwell, Moore & Walker (2011) indicating that machinima makes it easier to work together and create social and collaborative context. The students expressed multiple prsepectives of collaboration in their reflections, these are visible below:

- *We had good relationship after class. We do not know each other before but now we are good friends. We had good harmony with our friends. We enjoyed by doing our work. On the other hand, discipline was a first factor for us to make a good work. (P5.)*

- *It's also useful for teachers or even undergraduate students like us in terms of working cooperatively.*
- *I think relationship between us got stronger due to this task. (P6.)*
- *I realized that working with a group is really different from working alone. Being together increases the creativity and pace. Each of us had a work to do. We both learned and enjoyed. (P7.)*
- *Secondly, I realised that, it's not always possible to work with everyone. What I mean is, you should be careful in each step when you're working with your friends, because some of them may not be concerned, or may leave you alone in the middle of the work. (P8.)*
- *As I said above, cooperation, understanding and reliance is most important needs to work as a group. We did it. (P9.)*
- *My experience with machinima was just "a great pain" not because it was difficult but because it needed a group work. Once again I understood that working with a group is painful for me. (P10.)*
- *I would say, we all learned how to use Second Life and Camtasia to some degree, but most of all, we learned how to compromise and work together. (P11.)*
- *I learnt lots of things; firstly, group work is the best for this kind of work if you are beginner because the more people the more creativity and the less anxiety. (P12.)*
- *Firstly, to create it, we have to be in a group and spend our much time to work together. To success this common work situation, we had to take our friends needs into consideration and this is the hardest one. I mean finding common spare hour, day or a common place is really hard. (P13.)*
- *Apart from these we as a group learnt the responsibility among the group members. Each person in the group try to do their best of their duty. So we learned how to create something in collaboration. (P14.)*

As is seen from the reflections, the students found the collaboration difficult and complicated, however they also expressed that they were proud with their mutual products and that the groupwork was necesseary for beginner level machinima production. Muldoon & Kofoed (2009) characterize the machinma as enhancing "apprenticeship-style learning" thus enhancing coaching and modeling of thinking skills as well as collaborative and social learning. Koehler et al. (2011) persists that communication and collaboration are the ability of individuals to use effectively digital tools to discuss and come to conclusion together. They help students' communication and cooperative learning skills. In this respect, they are 21st century skills.

Learning

Since machinima is related to a number of other *semiotic domains* like videogame, filmmaking and animation, Morozov (2008, p. 5902) summarizes characteristics of effective learning of a given semiotic domain as "*learning and experience the world (see and act on) in a new way*". Viewed as a *semiotic symbolic representational domain* machinima could be used to develop digital literacy, as well as 21st century skills. The digital semiotic domain of machinima possesses incredible potential for enabling effective learning experiences. This is evidenced by the reflections of pre-service language teachers. Majority of the participants indicated that they learned a lot and that this project was an opportunity for learning by doing. When the categories were analyzed to explain what "a lot" means it is observed that the students explained it as learning about realtionships while working in groups, learning materials design for for foreign language teaching, learning many applications like Second Life, learning about 3-D Virtual Environments, Camtasia, script writing for role-plays, learning technical knowledge and skills like editing, voicing over, recording, new techniques, new perspectives, digital literacy. Some of the participants asserted that learning via machinima was inductive and authentic in nature and required using the imagination while learning.

- *Because the Second Life has many opportunities as I said above, it arises the imagination of the user. It was like an inspiration for me. The users have always a chance to think, imagine, discover themselves. You can also learn the meaning of point of view while shooting the machinima. (P15.)*
- *Lastly, I, sincerely say that, it was one of the most motivating and delightful school project for me. (P16.)*
- *It is absolutely learning by doing. Many forms, structures and moral lessons can be taught via it. It creates a real life atmosphere, it touches feelings, it provides an inductive learning environment, it really relaxes the doers. (P17.)*
- *Machinima isn't just a task for us, we obtained more things. Being together, laugh, entertain, information, happiness, dramatization, success, applaud, friends, creation of something are our words for machinima. (P18.)*

- *However, it was great pleasure to develop our technical skills and gain 3D virtual environment experience. (P19.)*
- *We learned how to add fragments, cut out unwanted scenes, add credits at the end and use "fade-in/fade-out" effects. (P20.)*
- *We learned how to cut and add the video on screen saver program. We have learned how to write on it and how to add music to our machinima. So I believe that now I can shoot a play with Second Life and add extra features to it like subtitles and music and use it in my language classes as an authentic material. (P21.)*
- *I learnt Camtasia so well that I helped any roommate from a different university to edit a video. (P22.)*
- *We learnt to create and use visual material, how to work effectively as group and how to use SL and Camtasia. (P23.)*
- *But all of us learned how to use Screencast-O-Matic, movie-maker, select music for a film and especially use Second Life. It was amazing experience for me. After this time, I could make montage, … I know where I will select outfit from, I know the features of movie-maker. (P24.)*
- *Because it needs lots of time, technical knowledge and also a place where we will be able to do this. (P25.)*
- *First of all, I learnt using Camtasia for editing, adding voices, music and other stuff. For Second Life, now I'm able to use, command my avatar effectively and appropriately. Let's say more effectively. Sometimes my friends act and record, sometimes I had to act and record because of either technical problems or the roles. (P26.)*
- *To sum up machinima is a useful tool in teaching and with this study my technical knowledge has increased. (P27.)*

Trilling and Fadel (2012) think that 21st century requires people to be technology literate who are capable of using digital technology tools and social networks efficiently with the purpose of accessing, managing, evaluating and creating information. The reflections of the participants above show that they feel confident that they acquired some digital and technical skills to make them proud members of the contemporary society. ICT Literacy and Media Literacy are also part of the 21st century skills which are referred to as in the reflections of the students. They have indicated that with the knowledge and skills that they learnt during the machinima task they can find different solutions in the creation of machinima that is a form of media to represent information. According to Middleton & Mather (2008) the educational value of Immersive Virtual Worlds (IVWs) seems to be in their social immersive qualities and as an accessible simulation technology. To them, student-generated production models the learning value may be found in the production process itself.

Technology

The participants confirmed that technology required to create machinima was complicated and they were confronted with many technical problems during the creation process. Among those problems they pinpointed poor wifi and internet connection, poor computer quality which hindered their access to 3-D VWs, difficulty in controlling the avatars, voice over, microphone problems, editing, sandboxes to build, places to record, recording and camera controls, limitations like copyrights and money, as well as that the creation was time consuming. These comments and reflections are confirming Lu's (2011) and Koenraad's (2013) studies who are reporting technical issues like "insufficient network bandwidth and computational power to use the 3-D environment".

- *However, it was great pleasure to develop our technical skills and gain 3D virtual environment experience. (P28.)*
- *When I first saw samples of machinimas, I thought creating one would be quite hard. Because it demands a high level of digital literacy to cope with it. (P29.)*
- *Rather than Camtasia, we used Screencast-O-Matic to take the film then we organized on Moviemaker. (P30.)*
- *We faced with many technical problems, we handled with some of them but still our machinima isn't sufficient from the technical aspects. (P31.)*
- *It was a difficult process, as well because most of us couldn't direct our avatar. The other problem we faced with was the echo of the voice then we learned to reduce it from the settings. (P32.)*
- *The shooting stage was really hard stuff for us. Many technical problems occurred related to voice and places. (P33.)*
- *You can have problems while using Second Life because there is no sandboxes that allow you to transform your items like clothes. Most of the items are not free but you can earn or buy Linden dollars for a minor charge. (P34.)*

Professional Development

Majority of the participants reported greater self-efficacy, self-confidence and self-esteem after completion of the task. They also reported increase in motivation to be a good teacher, that they believe they can keep up with the new technology, they are confident that they can create educational materials, and this experience will help them in their occupation and will enrich their materials and their lesson plans. All of these reflections are linked with professional development and a sense of achievement. The participants also reported creating machinima for other lessons and contexts and confidence that they can use this skill in their future professional lives.

- *To sum up, machinima has help me to develop my technical skills and also I learned new ways of preparing teaching materials. (P35.)*
- *We know that we can use it in our classes. (P36.)*
- *This machinima experience provides me on opportunity to bridge my methodological knowledge on real-virtual application, covering the lacks between knowledge and skill. (P37.)*
- *We added lastly voice as story telling and so that we can use it with another language thanks to voice narration. Anyway, I have learnt so much from this project and I have impressed so much that I have recorded one more machinima for my lesson plan project in Specialization in Language Teaching class as an original and self-made material. (P38.)*
- *A lot of technical information about machinima is obtained for me. I learnt how to create and use machinima in language learniFng as an educational material. (P39.)*
- *In my opinion, I may be expert on machinima. (P40.)*
- *I will show you all of my gain when I become a teacher, a teacher who is satisfied with her job. (P41.)*
- *So, when I will be a teacher, surely I will use machinima in my education. Now, I feel myself a 3-D cinema maker. (P42.)*
- *Right now I feel confident both about machinima and the Second Life. At least, I am not afraid of it. If we had much more time and saw much more examples, we could create more successful play. The most important part is that, when I become teacher I can use machinima in a more effective way rather than other ways. I think it will be very interesting and useful for students. They are already better at technology than us. With technology integrated ways language teaching can be easier in the future. (P43.)*
- *Also it improved me in terms of using technological materials like sound effects, camtasia, which will help me in my occupation. In addition, I learned how to apply technology (Second Life, Camtasia, Machinima) to my class. Preparing motion Uma makes me feel that I'm following technological improvements, which is essential for us. It makes me think that I'm not behind that improving technology. (P44.)*
- *As a teacher, I can prepare a video and I can put it into pre-task. My students can watch it and then can work for the while task stage. I can say that Machinima program can enrich our teaching materials and can enrich our lesson plans, so learning how to use it is a big win. (P45.)*
- *In addition, I saw that I can prepare and create my own lesson materials for my students. And Lastly, I think that I can do better assignments after that. This assignment improved me. (P46.)*
- *Although we have many difficulties such as technical problems, unavailable places, Limited time, we could produce and you thing which we haven't done before. Learning new things is outcome of the machine, and we can use it in our future professional lives. (P47.)*
- *Firstly, as a prospective teacher, getting such technological competence Will make me one jump ahead of others. With the help of it, I believe that I will begin leaving behind the problems like shy students who do not like to speak or act. (P48.)*

Resource

As a form of a task the machinima was reported to be a limitless resource. The participants asserted that it can help learn a language, practice new language, teach language and is more effective way to transfer information, is a form of realia, is authentic and helps teaching in a contextualized way.

- *In SL, we used limitless sources, actually. We found houses, ballet schools and costumes for free. We changed the weather according to the scenario. We made our characters put up or loose some weight. We used animal voices, when Mike was fighting with his wife. To show, Mike was happy, we made him smile using gestures and mimics section in SL. (P49.)*
- *Second life is a 3D virtual world and while I was preparing my work I met with foreign people and talked to them. I can also make a company with other people from different country. It also helps us to improve our English. If I work on it I can discover more things and share with my students in future. (P50.)*

- *This gives the student the opportunity for autonomous learning. We are in technological/digital era. Keeping children in learning environment such as class is a hard stuff but SL gives the opportunity of being outside the classroom but in a learning environment. (P51.)*
- *I think machinima is a great way of designing materials for a lesson. Because you shape your own characters, place and plot. You can even shoot short films. You can employ it as a listening task with or without subtitles or you can make students present the same story as a role-dramatizing that makes learning more memorable. There can be many more task related to this machinima. (P52.)*
- *All in all, I learned that Second Life and machinima have great opportunities for language teaching and makes lesson more enjoyable. (P53.)*
- *Instead of books and many traditional approaches, using Second Life exactly would be more effective way to transfer information. While I was watching the videos in the class, I'd realized it one more time. (P54.)*
- *By using machinima, we created more motivating material for language classes. We experienced technological devices actively. Moreover, we learned how to take a video from virtual environment and its technical knowledge (cut, paste, import media, recording the screen, adding transitions, music, sound effect and so on). We bought things from SL market… I don't know. It more reflective to present our experiences by using machinima. (P55.)*
- *We always talk about presenting our students with realia, what could be more real than a 3-D world material. (P56.)*
- *This way they would learn it in a contextualized way. (P57.)*
- *Secondly, we as teacher need to use this kind of stuff in our class for the sake of authenticity, learning, teaching and creativity. (P58.)*

Creativity

According to the reflections obtained in the end of the study, machinima increases creativity, transforms the feelings and thoughts into a creative – own – product, and is a creative material for the class. Machinima as a by-product of the digital game, has been seen as a *storytelling form of artistic expression and creation* in Hui-Chun Hsiao (2013) by combining visual game scenes, actions and narrative.

- *It increases creativity or critical thinking skill. (P59.)*
- *It lets students to be creative the most important issue. (P60.)*
- *We had a chance to transform our feeling and thoughts into a creative –our own- product. (P61.)*
- *While making our Machinima "known unknown" a machinima about cultural awareness, I discovered that there are many great opportunities for us to prepare creative materials in our class. (P62.)*

Creativity and innovation are also among the 21st century skills according to the (P21 Framework for 21st Century Learning), thus the comments of the participants provide the fact that the machinima task increases and allows for creativity in the learning process. Yeni (2017, p. 97) postulates that in her work "*qualitative and quantitative data results show that teacher-training programs in Turkey focus mostly on theory*". She has developed "21st Century Skills Material Design Teacher Training and Professional Development Program" and her findings indicate that after the training her in-service language teachers improved their creativity and created their own materials as well as shared the materials they had prepared and started using 21st century digital skills in their own classes (Yeni 2017, p. 95).

CONCLUSIONS

All of the themes that were found to be central in the reflections of the students were observed seperately in other research in the literature. For instance, findings of Koenraad (2013) and Butler, (2012) indicate that machinima provides engagement in domain related practice, ownership of inquiry and motivating learning context. Thus machinima provides engagement and motivation in education as well as teacher training. The research reported in the study of Muldoon & Kofoed, (2011) that has been conducted in accounting education with machinima confirms that students appreciated the technology-enhanced learning environment, which resulted in significantly increased level of engagement and active learning. Barwell, Moore & Walker (2011) stress that incorporating "machinima" for education helps the development of learning engagement. The findings of our case study are also in line with Johnson & Runo (2011) who did a study designed to show educators the potential of machinima and they argue that machinima is a new level of *storytelling* that could captivate the students. The majority of our participants proposed that machinima production was both challenging but fun, and they used more positive ajectives when they defined the experience that they had during the task.

Machinima production requires students to collaborate as production takes a lot of resources and necessitates a lot of knowledge on the side of the learners. Likewise, in his work, Harwood (2013) suggests that machinima is '*digital clay'* that has the potential to add value to p*ractice-based learning in a connected world*. The CAMELOT Project evaluation revealed that "a positive course outcome was the sense of community developed during the training through collaborative engagement in the process of creating machinima, which was considered as most effective and rewarding (Thomas & Schneider, 2018). Participants of the study indicated a strong support for the collaborative nature of the task, and they also confirmed the development of strong bonds among themselves. However, some of the participants also indicated that collaboraton on such a task is more difficult and complicated. In addition to positive experience and collaborative nature of the machinima task, the participants also mentioned about hıw much they learned from the task. They stressed that they learned by doing, they learned many apps, technical knowledge, and digital literacy for designing foreign language materials. To Middleton & Mather (2008) student-generated production models the learning value that may be found in the production process itself. In this respect, Muldoon & Kofoed's (2011) findings also revealed that the development of higher order thinking skills is best facilitated in authentic contexts that represent the values and practices of the discipline.

Participants reported many drawbacks from the machinima task, especially regarding the technology. They put forward that the technology required to create machinima is complicated, computer specifications and Internet connection are troublesome, it is time consuming, and there are limitations like copyright issues and money. These have been confirmed by the studies of Lu (2011) and Koenraad (2013) as well. However, Koç (2005, p. 13) stresses that "*interactive, self-directed learning and higher order thinking can be fostered by technology, and that technology can have the greatest benefit when the environment is conducive to such experiences*." The problems and the drawbacks could be a source for learning and development of the teachers as the problem solving process to complete a task could enhance a valuable experience to support the teachers in their careers.

Likewise, the participants confirmed that their self confidence, self-esteem and self-efficacy has definitely increased. Machinima task helped with increase in motivation and enrichment of the language classes. Horlescu (2017) found out that the teachers who used machinima in her professional development training developed digital literacy which helped overcome the constraints of digital technologies through synaesthesia, spontaneous improvising and coaction. Our study reveals that the pre-service English language teachers believe that machinima can be used as a task for language learning where learners can practice language, machinima can cater for transfer of linguistic information as well as authentic and contextualized language practice. Last but not the least, according to out thematic analysis machinima increases creativity, transforms the feelings and thoughts into creative products to be used in the class. Hui-Chun Hsiao (2013) thinks that Machinima, a by-product of the digital game, has been seen as a *storytelling form of artistic expression and creation*. As seen from the pre-service student responses, using 3D Machinima in the training of the pre-service English language teachers enhances many affrodances like good experience, collaboration, learning, technology knowledge, professional development, obtaining a good resource and creativity. In summary, training pre-service teachers with machinima enhances learning by doing as well as many other benefits as stated above. The process of producing Machinima presents a constructivist environment in which the pre-service language teachers can develop internal cognitive connections and rely on them in their professional lives.

REFERENCES

Barwell, G. & Moore, Ch. & Walker, R., (2011) Marking Machinima: A Case Study in Assessing Student Use of a Web 2.0 Technology, Australasian Journal of Educational Technology 2011, 27, 765-780 http://www.ascilite.org.au/ajet/ajet27/barwell.pdf (2014-04-15)

Bassey, M. (1999). Case study research in educational settings. USA: Open University.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. http://dx.doi.org/10.1191/1478088706qp063oa

Butler, D., Second Life machinima enhancing the learning of law: Lessons from successful endeavours, Australasian Journal of Educational Technology 2012, nr 28 383-399. http://www.ascilite.org.au/ajet/ajet28/butler.pdf (2014-04-15)

Canagarajah, S. (2005). Reclaiming the local in the local language policy and practice, Lawrance Earlbaum Associates, NJ, USA

Chamot, A.U. & EI-Dniary, P.B. (1999). Children's learning strategies in immersion classrooms. The Modern Language Journal, 83(3), 319-341.

Cohen, L. ve Manion, L. (1997). Research methods in education. London: Routledge.

Conkey, C., MACHINIMA AND VIDEO-BASED SOFT SKILLS TRAINING, University Central of Florida 2010, http://etd.fcla.edu/CF/CFE0002984/Conkey_Curtis_A_201005_PhD.pdf (2014-04-15)

Dede, C (2004). *Design-based research strategies for studying situated learning in MUVE.* Paper presented at the 2004 International Conference on Learning Sciences, Mahweh.
Denzin, N. K. ve Lincoln, Y. S. (1996). Strategies of qualitative inquiry. London: Sage Publications.
Johnson, P. & Runo, R. (2011), The Fantastic and The Furious: Capturing Moments Through Machinima, http://business.treet.tv/shows/bpeducation/episodes/bpe2011-051
Hancock, H., & Ingram, J. (2007). Machinima for Dummies, Hoboken, NJ: Wiley Publishing Inc.
Harwood, T. (2013). Machinima as a learning tool. Digital Creativity, 24(3), 168-181
Horlescu, Alina and O'Hagan, Minako (2017) *Rethinking world language teacher education TPACK for integration of digital literacies in the classroom.* PhD thesis, Dublin City University.
Hui-Chun Hsiao, Using Machinima as a Method for Digital Color Practice and Narrative Creation
http://www.iafor.org/offprints/acset2013-offprints/ACSET2013_offprint_0531.pdf
Koç, M. (2005). Implications of learning theories for effective technology integration and pre-service teacher training: A critical literature review. Journal of Turkish science education, 2(1), 2-18.
Koehler, M. J., Mishra, P., Bouck, E. C., DeSchryver, M., Kereluik, K., Shin, T. S., & Wolf, L. G. (2011). Deep-play: Developing TPACK for 21st century teachers. International Journal of Learning Technology, 6(2), 146-163.
Koenraad, Ton: exploring teacher roles in 3d virtual worlds projects in modern language and teacher education. In: R. McBride & M. Searson (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2013* (pp. 3514-3521)
Lansiquot, R., & Rosalia, C. (2008). Second languages, virtual worlds: Living second lives. In J. Luca & E. R. Weippl (Eds.), Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008 (pp. 2660-2669). Chesapeake, VA: AACE.
Lu, L. (2011). Art Education Avatars in Action: Preparing Art Teachers for Learning and Teaching in a Virtual Age (for Special issue Digital Games and Simulations in Teacher Preparation). *Journal of Technology and Teacher Education, 19*(3), 287-301. Chesapeake, VA: SITE.
Mayring, P. (2000). Nitel sosyal aras□tırmaya giris□. (C□ev. A. Gu□mu□s□ ve M. S. Durgun). Adana: Baki Kitabevi.
Meyers, E. M., (2014). Using Machinima as Cultural Probes to Study Communication in Children's Virtual Worlds: An Exploratory Approach, https://www.ideals.illinois.edu/bitstream/handle/2142/47264/313_ready.pdf?sequence=2 (2014-04-15)
Middleton, J. & Mather, R. (2008). Machinima interventions: Innovative approaches to immersive virtual world curriculum integration, 16(3), 207-220.
Morozov, A. (2008). Machinima Learning: Prospects for Teaching and Learning Digital Literacy Skills through Virtual Filmmaking. In J. Luca & E. Weippl (Eds.), Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2008(pp. 5898-5907). Chesapeake, VA: AACE.
Muir, T., Allen, J. M., Rayner, C. S. and Cleland, B. (2013), Preparing pre-service teachers for classroom practice in a virtual world: A pilot study using Second Life, *Journal of interactive media in education*, vol. Spring Issue.
Muldoon, N. & Kofoed, J. (2009). Second Life Machinima: Creating new opportunities for curriculum and instruction. In G. Siemens & C. Fulford (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2009* (pp. 2243-2252).
Muldoon, N. & Kofoed, J. (2011). Exploring the Affordances of Second Life Machinima as an Anchor for Classroom-based Apprenticeship. *International Journal on E-Learning, 10*(4), 419-439.
Patton, M. Q. (1990). Qualitative evaluation and research methods. USA: Sage.
P21 Framework for 21st Century Learning: http://www.p21.org/
Robson, C. (2001). Real world research. Oxford: Blackwell.
Thomas, M. & Schneider, C. (2018) *Language Learning with Machinima: Video Production in 3D Immersive Environments.* In: Teaching English reflectively with technology. IATEFL, Canterbury, UK. ISBN 978-1-901095-86-9
Trilling, B., & Fadel, C. (2012). 21st century skills: Learning for life in our times. John Wiley & Sons.
Yeni, G. (2018). "The Effect of 21st Centory Skills Training on Foreign Language Teachers' Perceptions Regarding Their Educational Technology and Materials Development", MA Thesis, Istanbul University – Cerrahpaşa,
Yıldırım, A. ve S□ims□ek, H. (2005). Sosyal Bilimlerde Nitel Aras□tırma Yo□ntemleri. Ankara: Sec□kin Yayınları.