DIGITAL CITIZENSHIP

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ABSTRACT
Era in which we live is known and referred as digital age.In this age technology is rapidly changed and developed. In light of these technological advances in 21th century, schools have the responsibility of training "digital citizen" as well as a good citizen. Digital citizens must have extensive skills, knowledge, Internet and technology access and schools must guide the students to be a digital citizens. Ribble and Bailey (2007) described the digital citizens features in schools that need to have in nine touchpoints. Based on these points, this research is aimed to develop a scale about digital citizenship.
Keywords: digital age, digital citizen, digital citizenship

INTRODUCTION

Strongly expanded information and communication technology (ICT) has changed life, people and era. Anymore, ICT has become the sine qua non of our lives. Upon this change, using digital tools is increased, primary requirement for individuals is being to use ICT effectively not only for entertainment but also searching for and sharing information, communication, access, law and consumption.

The changing era with ICT has led to the exchange the characteristics of individuals and upon this the characteristics of the community. Digital era that digital tools are widely used is endeavoring to create digital citizens from the digital society. Schuler(2002) defined digital citizens as "the characteristic of a genuine digital city". Digital citizen is generally identified as "those who use the Internet regularly and effectively" (Mossberger, Tolbert & McNeal, 2011).

Digital citizen must have some characteristics such as understand human, cultural, and societal issues related to technology and practice legal and ethical behavior; advocate and practice safe, legal, and responsible use of information and technology; exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity; demonstrate personal responsibility for lifelong learning; and exhibit leadership for digital citizenship (Ribble, 2008). A Common Sense Media White Paper(2011) explained that digital citizenship means the ability to use technology competently; interpret and understand digital content and assess its credibility; create, research, and communicate with appropriate tools; think critically about the ethical opportunities and challenges of the digital world; make safe, responsible, respectful choices online   To understand the characteristics of digital citizens and digital citizenship clearly, based on previous works (Ribble, Bailey & Ross, 2004, Ribble & Bailey, 2004a, Ribble & Bailey, 2004b, Ribble & Bailey, 2004c, Ribble & Bailey, 2005), Ribble & Bailey(2007) described nine areas of behavior that digital citizenship must have: access, commerce, communication, literacy, etiquette, law, rights and responsibilities, health and wellness, security(self-protection).

Digital citizenship goals for the 21st century are educate, empower and protect (Common Sense Media White Paper, 2011). Ribble & Bailey(2007) explained these three as respect(etiquette, access, law), educate(communication, literacy, commerce) and protect(rights and responsibility, safety/security, health and welfare).

Being digital citizen is more important thing in nowadays. Therefore in education there are some key features to make the students digital citizens for looking at the 21st century digital citizenship goals. These key factors are student learning and academic performance, student environment and student behavior, student life outside the school environment. Ribble & Bailey(2007) sorted the nine areas of behavior for making up digital citizenship under these three keys.

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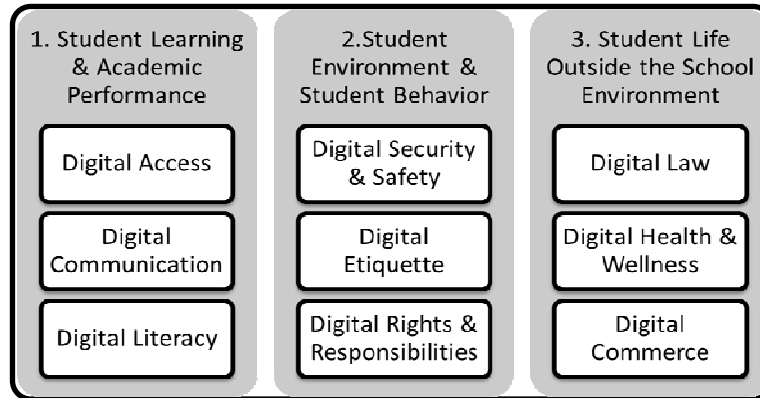*E-mail address:* isman@sakarya.edu.tr

Fig. 1. Digital Citizenship Touchpoints (Ribble & Bailey, 2007)

Student Learning & Academic Performance
1- Digital Access: full electronic participation in society.
2- Digital Communication: electronic exchange of information.
3- Digital Literacy: process of teaching and learning about technology and the use of technology.

Student Environment & Student Behavior
4- Digital Security (self-protection):   electronic precautions to guarantee safety.
5-Digital Etiquette: electronic standards of conduct or procedure.
6- Digital Rights & Responsibilities: those freedoms extended to everyone in a digital world.

Student Life Outside the School Environment
7- Digital Law: electronic responsibility for actions and deeds
8- Digital Health & Wellness: physical and psychological well-being in a digital technology world.
9- Digital Commerce: electronic buying and selling of goods.

This era which people must have digital citizenship features, education and students are important for doing this. Hence the aim of the research is to develop a scale about digital citizenship based on Ribble & Bailey(2007)' s digital citizenship nine touchpoints for analyzing students.

METHOD
Population
The population of this study constitute of students of the Faculty of Education of Sakarya University in the 2012-2013 academic year. The population consists of a total of 4395 students. Participation in the study was on a voluntary basis. Convenience sampling method was used in the study. Totally 229 students from the undergraduate program in Elementary Teaching, Pre-school Teaching, Turkish Teaching, Religion and Ethics Education filled out the questionnaires.

Data Gathering Tool
Developing a scale is the aim of this study. For developing the Digital Citizenship Scale (DCS), first literature was reviewed and item pool was created based on Ribble & Bailey(2007)' s digital citizenship nine touchpoints. Four experts evaluated these items and accordance with the experts' recommendations, the scale was created as 34 items. This scale was applied to the participants and reliability and validity analyses were performed.

The 34-item scale was developed as five-point Likert-type scale. The students answered the items by selecting one of the "Strongly Agree", "Agree", "Neutral", "Disagree", "Strongly Disagree" options.

Data Analysis
SPSS 21 statistical software was used for performing construct validity and reliability analyses. For analyzing construct validity, exploratory factor analysis was used. Nine factors were found in the exploratory factor analysis. Moreover internal consistency coefficients were used for examining the reliability of the scale. After validity and reliability analysis the scale has 33 items.

FINDINGS
Validity
For analyzing construct validity of DCS, exploratory factor analysis was used. Stevens(1996) explained "the purpose of exploratory factor analysis is to identify the factor structure or model for a set of variables.". According to this purpose, first, Kaiser-Mayer-Olkin (KMO) coefficient and Bartlett sphericity test were used for analyzing suitability of the data for factor analysis by exploratory factor analysis (EFA). KMO coefficient gives the information about the suitability of the the data matrix for the factor analysis, the suitability of the data structure for factor extraction and this coefficient is expected to be higher than .60 (Büyüköztürk, 2007). In the analysis the KMO value for the DCS was found .75. Also the Bartlett test determines the relationship between the variables on the basis of partial correlations, and the calculated chi-square statistic is expected to be significant (Büyüköztürk, 2007). The calculated chi square statistic was $\chi2 = 3336, 213, p. =.000$ in the Bartlett sphericity test. KMO coefficient and Bartlett sphericity test indicate that the collected data are suitable for the factor analysis.

Firstly, items are categorized under nine factors with eigenvalues over 1 and the communalities of the items varied between .541 and .907 in the results of exploratory factor analysis (EFA).
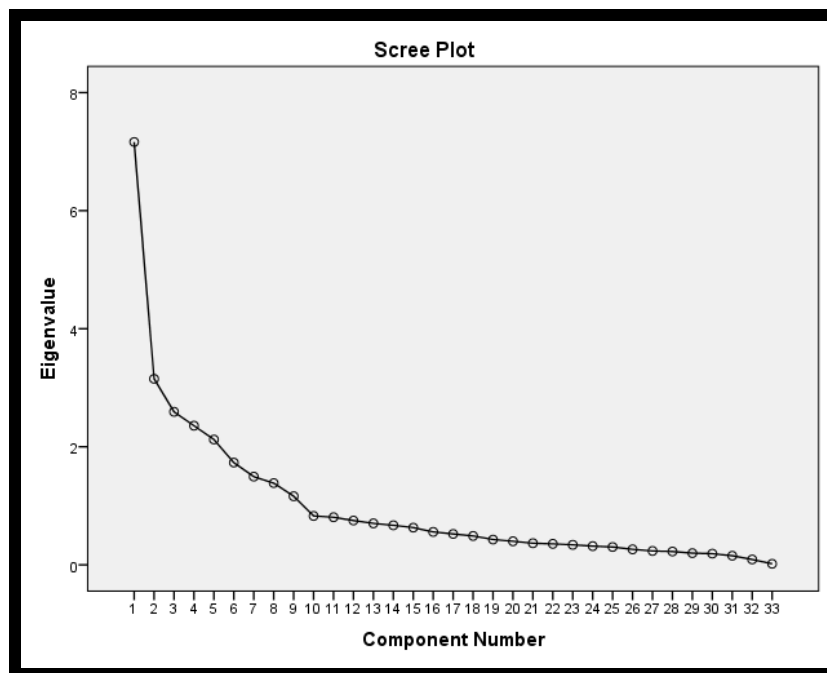

Fig. 2. Scree Plot

As a result of the EFA, scree plot showed that the scale has nine factors. Eigenvalue of the factors and the total variance explained supported this structure.

Table 1. Eigenvalue of the factors and the explained variance

Factors		Items	Eigenvalue	% of Variance
Factor 1	Digital Literacy	8,9,10,11,12,13	7.163	21.707
Factor 2	Digital Law	25,26,27,28	3.151	9.548
Factor 3	Digital Rights & Responsibilities	21,22,23,24	2.593	7.856
Factor 4	Digital Communication	1,2,3,4	2.357	7.142
Factor 5	Digital Security	14,15,16	2.123	6.432
Factor 6	Digital Commerce	32,33,34	1.732	5.247
Factor 7	Digital Access	5,6,7	1.494	4.527
Factor 8	Digital Etiquette	17,18,20	1.384	4.195
Factor 9	Digital Health & Wellness	29,30,31	1.163	3.523

Eigenvalue of the first factor is 7.163, eigenvalue of the second factor is 3.151, eigenvalue of the third factor is 2.593, eigenvalue of the fourth factor is 2.357, eigenvalue of the fifth factor is 2.123, eigenvalue of the sixth

factor is 1.732, eigenvalue of the seventh factor is 1.494, eigenvalue of the eighth factor is 1.384, eigenvalue of the ninth factor is 1.163. Moreover the first factor explains 21.707% of the total variance, the second factor explains 9.548% of the total variance, the third factor explains 7.856% of the total variance, the fourth factor explains 7.142% of the total variance, the fifth factor explains 6.432% of the total variance, the sixth factor explains 5.247% of the total variance, the seventh factor explains 4.527% of the total variance, the eighth factor explains 4.195% of the total variance and the ninth factor explains 3.523% of the total variance. The total explained variance of the scsle is 70.178%.

Second, varimax rotation technique was used in order to facilitate the disclosure of important factors. Item 19 was removed from the scale because item's factor loading showed that it was also under the two factors. The factor loadings are between the lowest .558 and the highest .889. The total explained variance values of the scale and factor loadings show that the scale is successful in explaining digital citizenship.

Table 2. Results of the exploratory factor analysis

Item	Communalities	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9
i13	,703	,731								,306
i9	,577	,667								
i8	,556	,603								
i12	,534	,587								
i11	,545	,559								
i10	,527	,558								
i27	,786		,868							
i26	,750		,823							
i28	,630		,773							
i25	,656		,701	,335						
i22	,810			,795						
i21	,659			,761						
i24	,647			,740						
i23	,688		,366	,653						
i2	,751				,849					
i1	,600				,749					
i4	,567				,674					
i3	,667	,346			,636					
i16	,885					,897				
i14	,839					,885				
i15	,634					,770				
i32	,812						,880			
i34	,715						,828			
i33	,728						,820			
i5	,908							,852		
i6	,896							,843		
i7	,694							,665		
i18	,771								,853	
i17	,695								,760	
i20	,659								,736	
i31	,794									,856
i30	,738									,739
i29	,693									,738

*Loadings are values above .30.

RELIABILITY
For the reliability of the DCS, Cronbach's Alpha internal consistency coefficient was calculated. As a result of the analysis, the Cronbach's Alpha value of the scale is .85. According to the factors, the Cronbach's Alpha value of the Factor 1 is .78, the Cronbach's Alpha value of the Factor 2 is .84, the Cronbach's Alpha value of the Factor 3 is .80, the Cronbach's Alpha value of the Factor 4 is .79, the Cronbach's Alpha value of the Factor 5 is .85, the Cronbach's Alpha value of the Factor 6 is .84, the Cronbach's Alpha value of the Factor 7 is .90, the Cronbach's Alpha value of the Factor 8 is .70 and the Cronbach's Alpha value of the Factor 9 is .70. The .70 or

higher calculated reliability coefficient for psychological scales is considered sufficient in terms of the reliability of the scale (Büyüköztürk, 2007). Thus, the Digital Citizenship Scale and its factors developed have a high reliability level. This finding indicates that the scale is able to distinguish between students' digital citizenship or not.

CONCLUSION

In this study, a scale was developed to measure the digital citizenship levels of students of a faculty of education. First, item pool was created after reviewing the literature and receiving expert opinion. Then the 34-item scale was applied to students of the Faculty of Education of Sakarya University in the 2012-2013 academic year. Reliability and validity analyses were conducted on the data collected from 229 students from the undergraduate program in Elementary Teaching, Pre-school Teaching, Turkish Teaching, Religion and Ethics Education.

For examining validity of DCS, exploratory factor analysis was used. The EFA showed that all the items had high factor loadings and items are categorized under nine factors. The nine factors in the DCS explained 70.178% of the total variance. The total variance explained and the factor loadings show that the scale is successful in capturing digital citizenship level. Thus, it can be safely argued that the scale provides a valid measure of digital citizenship.

To examine the reliability of the scale, the Cronbach's Alpha value was calculated. The value calculated was high (.85), which showed that the scale has high reliability.

In conclusion, the reliability and validity analyses conducted show that the DCS developed is an effective measurement tool that can be used to study about digital citizenship. The scale can be used in future studies.

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