Extended Summary

Adaptation of Using ICT in Biology Teaching Attitudes Scale to Turkish:
A Validity and Reliability Study

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Summary

Current explosion of information has led to fundamental changes in education. These radical changes are seen especially in education systems. Memorization-based education systems designed within the framework of the information-loaded individual model are now replaced with systems that require research and interrogation. Today, what is important is not the information itself but how to access it. Thus, the fact that we live in a world of information and communication technologies has increased the importance of this situation. In this respect, the need for information and communication technologies that allow accessing, questioning and evaluating the information is of great significance (Özmusul, 2008).

The term “Information and Communication Technologies” refers to transferring, storing, revealing and sharing technology or accessing information. Information and communication technologies include radio, television, video, DVD, phone (fixed and mobile), satellite systems, computer and network equipment and software as well as the equipment and services provided by these technologies (such as video-conference and electronic mail) (UNESCO, 2006).

As biology includes complex relationships of unfamiliar and abstract concepts, it is quite difficult to learn and teach. In biology teaching, the fact that educational situations and biology concepts are abstract and complex causes students to experience difficulty in understanding certain subjects and to learn them via memorization without understanding (Kılıç and Sağlam, 2004). In order to solve this problem, the use of information and communication technologies is increasingly important. It is especially important in biology if
computers can present the information visually. Well-prepared pictures, three-dimensional models, animations, interactive environments and so on help comprehend the target information more easily (Çömlekçioğlu and Bayraktaroğlu, 2001).

The purpose of this study is to determine the validity and reliability of original version of the using ICT in biology teaching attitudes scale developed by Kubiatko ve Haláková (2009) in Turkey conditions. The orginal scale which includes 28 items. Every item in the scale is 5-scale by Likert. Likert scale question comprised five points ranking following: “strongly agree” (5 points), “agree” (4 points), “neutral” (3 points), “disagree” (2 points), “strongly disagree” (1 point). Several questions were constructed negatively. The evaluation of them was in reverse order. The scale consist of five dimensions namely: the positive influence of ICT; the negative influence of ICT; advantages of ICT; ICT used in biology lesson; disadvantages of ICT. Cronbach’s Alpha internal consistency coefficient of the scale was calculated to be 0.82.

Experts and researcher made translation of the scale into Turkish. Then, experts in terms of consistency, content and measurement issues also analyzed the scale. Revised version of the scale was administered to 220 high school students to determine its validity and reliability. The suitability of data for factor analysis was determined by KMO (Kaiser-Meyer-Olkin) parameter and Bartlett test. The results (KMO= 0,82, $\chi^2= 1314,04$ (p< .001) showed that the obtained data was suitable for exploratory factor analysis and then the construct validity of the survey was examined by exploratory factor analysis. Exploratory factor analysis was done by using Varimax technique. As a result of Varimax rotation, it was found that there are three factors whose Eigen values are 6,472, 3,570 and 1,661. At he end of the analysis, the scale that has 26 items, 3 sub dimensions and accounts for %45,01 of total variance was found. Having 0.40 factors load values and above for each item in the scale was taken into consideration. So, two items has 0,28 and 0,16 factors load values were excluded from the scale. The dimensions are defined as advantages of ICT, disadvantages of ICT, using ICT in biology lesson.

Reliability analysis of the scale revealed Cronbach-Alpha coefficients of 0,85 for the total scale, 0,83 for the dimension of advantages of ICT, 0,80 for the dimension of disadvantages of ICT and 0,74 for the dimension ICT using in biology lesson. The results of
the total correlation of the items and %27 sub-up groups comparisons state that item differentiating power of the scale is enough. Also; the mean score of the study group regarding the using ICT in biology teaching attitudes scale was found to be 3.60 and the standard deviation was calculated as 0.694. Depending on the mean score, it could be stated that the participating students has positive attitudes towards ICT using in Biology Teaching.

According the findings; the Turkish form of the using ICT in biology teaching attitudes scale that has 26 items is valid, reliable and suitable for Turkish. The gained results show that the scale can be used for the studies in Turkey.