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SURVEY ARTICLE

Development of Teachers' Perception Scale Regarding Artificial Intelligence Use in Education: Validity and Reliability Study

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ABSTRACT

This article aims to develop a teachers' perception scale regarding the artificial intelligence use in education. The scale development study was carried out in two stages during the 2023–2024 academic year, covering 597 teachers who stated that they used different artificial intelligence applications. Literature was thoroughly reviewed and focus group interviews were held with teachers who used artificial intelligence applications in education while pooling scale items. Field expert faculty members were consulted in evaluating face and content validity of the scale. Exploratory factor analysis was performed on the data obtained from the first sample group ($n = 424$), and a three-factor structure was determined in the first stage. It was observed that the factors of the first draft scale, consisting of 18 items, revealed 57.8% of the total variance. The first confirmatory factor analysis was conducted on the data collected from the second sample group ($n = 173$) in the second stage. It was confirmed that the structure consisting of 18 items and three factors (teaching perception, learning perception, and ethical perception) was compatible with the data. After the first-level confirmatory factor analysis for the Teachers' Perception Scale Regarding Artificial Intelligence Use in Education, a second-level confirmatory factor analysis was conducted to determine whether the factors that made up the scale revealed the variable. The final scale, consisting of 15 items and three dimensions, was determined to be compatible with the data obtained. Reliability analysis presented that the Cronbach alpha internal consistency coefficient was calculated as .87 for the whole scale, .82 for learning perception, .79 for teaching perception, and .79 for ethical perception. The results show that the teachers' perception scale regarding artificial intelligence use in education is valid and reliable, and a sound measurement tool to determine the perception regarding artificial intelligence use in education.

1. Introduction

The term "artificial intelligence" (AI) was revealed by John McCarthy in 1956 for the first time. However, the Turing test, developed in the 1950s, was a milestone for AI (Arslan, 2020; İşler & Kılıç, 2021). The Turing test was a measurement tool that determined whether a machine had cognitive competency like human beings (Muggleton, 2014). In the following periods, such terms as "expert systems," "machine learning," "data mining" and "deep learning" made a breakthrough in the process of AI (Haenlein & Kaplan, 2019).

Then, what is AI? Russell and Norvig (2010) express AI as machines' ability to solve problems by imitating the thinking and learning function of the human brain. Nabiyev (2016) defines it as machines' ability to carry out human-specific cognitive functions while Obschonka and Audretsch (2020) refer to it as humanoid intelligence displayed by machines. These definitions show that artificial intelligence is related to the ability of machines to perform basic tasks that require human intelligence, such as reasoning, learning, perception and problem solving (Kaplan & Haenlein, 2019; Lieto et al., 2018). Within this scope, artificial intelligence is

a rapidly developing field that has great potential for societies to provide innovative solutions to problems in different areas. Thanks to this potential, artificial intelligence is used in many fields today, making human life easier and better (Derinalp & Ozyurt, 2024; Karaoglan Yilmaz et al., 2023).

The popularity of AI has had remarkable progress with the introduction of the ChatGPT artificial intelligence application produced by OpenAI. ChatGPT is a chat robot that provides users with logical and satisfying answers by compiling information on the internet (Lo, 2023). Thanks to the developed features such as making logical predictions, and quickly adapting to the language and experience of different people, applications similar to ChatGPT have been used in many areas (Arslan, 2020). It is an important element especially in fields like health, finance, education, communication, and transportation (Hutson et al., 2022). Yet, the impact of AI in education is still in its infancy compared to other fields (Arık & Seferoğlu, 2020; Tahiru, 2021). However, the pace of development in this field is expected to bring new artificial intelligence potentials in different

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Appendix A. Teachers' perception scale regarding artificial intelligence use in education.

Factor	No.	Item (English)	Madde (Türkçe)	(5) Strongly Agree	(4) Agree	(3) Partly Agree	(2) Disagree	(1) Strongly Disagree
Teaching Perception	1	Artificial intelligence makes planning easier in teaching.	Yapay zekâ öğretimde planlanmayı kolaylaştırır.					
	2	It supports the monitoring of the teaching process.	Öğretim sürecinin takibini destekler.					
	3	It offers contextual richness.	İçeriksel zenginlik sunar.					
	4	It supports individualized instruction.	Bireyselleştirilmiş öğretimi destekler.					
	5	It facilitates teaching difficult and complex subjects.	Zor ve karmaşık konuların öğretimini kolaylaştırır.					
	6	It provides continuity in feedback.	Geribildirimde süreklilik sağlar.					
	7	It provides rapid evaluation.	Hızlı değerlendirme sağlar.					
Learning Perception	8	It brings in reasoning ability.	Muhakeme becerisi kazandırır.					
	9	It increases motivation.	Motivasyonu artırır.					
	10	It encourages self-learning.	Kendi kendine öğrenmeye teşvik eder.					
	11	It increases curiosity in learning.	Öğrenme merakını arttırır.					
Ethical Perception	12[1]*	It gets people used to effortlessness.	Kolaycılığa alıştırır.					
	13*	It bears ethical threats.	Etik tehditler oluşturur.					
	14*	It gets people used to ready-made information.	Hazır bilgiye alıştırır.					
	15*	It trivializes information.	Bilgiyi değersizleştirir.					

*Items marked * at the beginning are reverse coded.