MEASURING AI READINESS IN COMPUTER SCIENCE STUDENTS: DEVELOPMENT AND ANALYSIS OF AIRSUS

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Abstract. *This paper reports on the development of an AI readiness instrument for computing education through exploratory analysis of mixed-methods data. We administered the AI Readiness Assessment Questionnaire for University Students (AIRQUS) to 140 first-year undergraduate students (71 Software Technologies and Design, 69 Software Engineering) at the Faculty of Mathematics and Informatics of Paisii Hilendarski University of Plovdiv, Bulgaria. From AIRQUS, we extracted and analyzed a 15-item quantitative subset (AIRSUS v1.0) measuring six theoretical constructs: AI literacy and awareness, AI use for English language learning, AI applications in software engineering, non-academic AI use, ethical considerations and academic integrity, and attitudes toward future AI integration. Exploratory analysis revealed acceptable internal consistency (Cronbach's $\alpha = .77$, McDonald's $\omega = .83$) and a three-factor empirical structure accounting for 47.2% of variance. Bivariate analyses showed theoretically meaningful associations with prior AI exposure ($\rho = .34$, p ¡ $.001$) and programming experience ($\rho = .27$, $p = .001$ with code error identification; $\rho = .24$, $p = .004$ with total scores). Systematic qualitative analysis of open-ended responses ($n = 140$) identified key themes including AI conceptualization patterns (49.3% view AI as tool/utility), primary use cases (code generation, debugging, learning), accuracy concerns (25.4%), and adoption barriers (46.4% fear overdependence). Synthesizing quantitative findings with qualitative insights, we developed AIRSUS v2.0, a refined 38-item Likert scale with standardized response formats and improved construct coverage designed for future psychometric validation and cross-institutional comparison. This exploratory work addresses the need for validated instruments assessing AI readiness in computing education and provides a foundation for systematic measurement of this emerging competency domain.*

Key words: Artificial Intelligence, AI Readiness, AI Literacy, Instrument Development, Computing Education, Mixed Methods, Scale Development, University Students.

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