

ALGORITHM LITERACY: SOCIO-PEDAGOGICAL ASPECTS

Research Group: Preschool and Media Education Department, Faculty of Educational Studies and the Arts
Research field: Media Education, Language Education

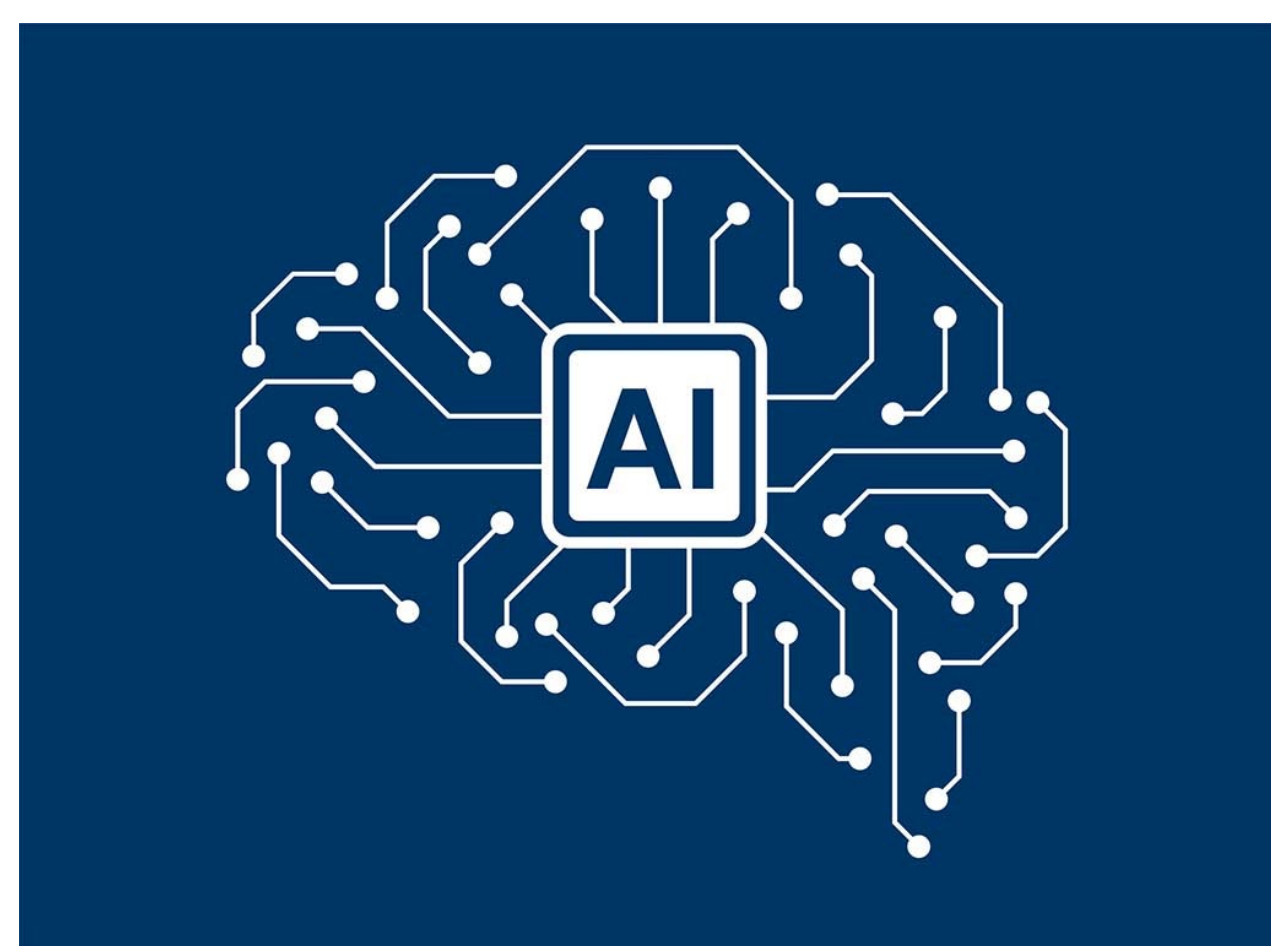
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Project guidelines

The present research aims at gaining in-depth insights of the extent to which undergraduate and postgraduate students in the field of education who use Internet resources, digital platforms, networks and services have developed comprehension of AI technologies and algorithm literacy.

For the specific objectives of this study respondents' algorithm literacy was assessed with the two-dimensional AL Scale for Internet Users (Dogruel, Masur & Joeckel 2021). Furthermore, a scale has been designed, seeking to establish the level of young adult Internet users' comprehension and engagement with generative AI models.

The conducted research additionally investigates respondents' self-assessment of their foreign language and coding skills, and measures their locus of control, using Locus of Control Scale (Rotter 1966).



Introduction

The speedy evolution of generative artificial intelligence (AI), as well as the ever-broadening range of its applications, the implications of new technologies gain still greater prominence. AI has an impact on education, science, media, and other spheres of both societal and individual daily lives and concerns.

Awareness and knowledge of how algorithms affect online content, which users interact with, enable them to avoid a wide range of potential risks.

The development of algorithm literacy (AL) as well as the comprehension of AI technologies will play a key role in successfully managing the challenges, as well as maximizing the opportunities brought forth by rapid technological progress

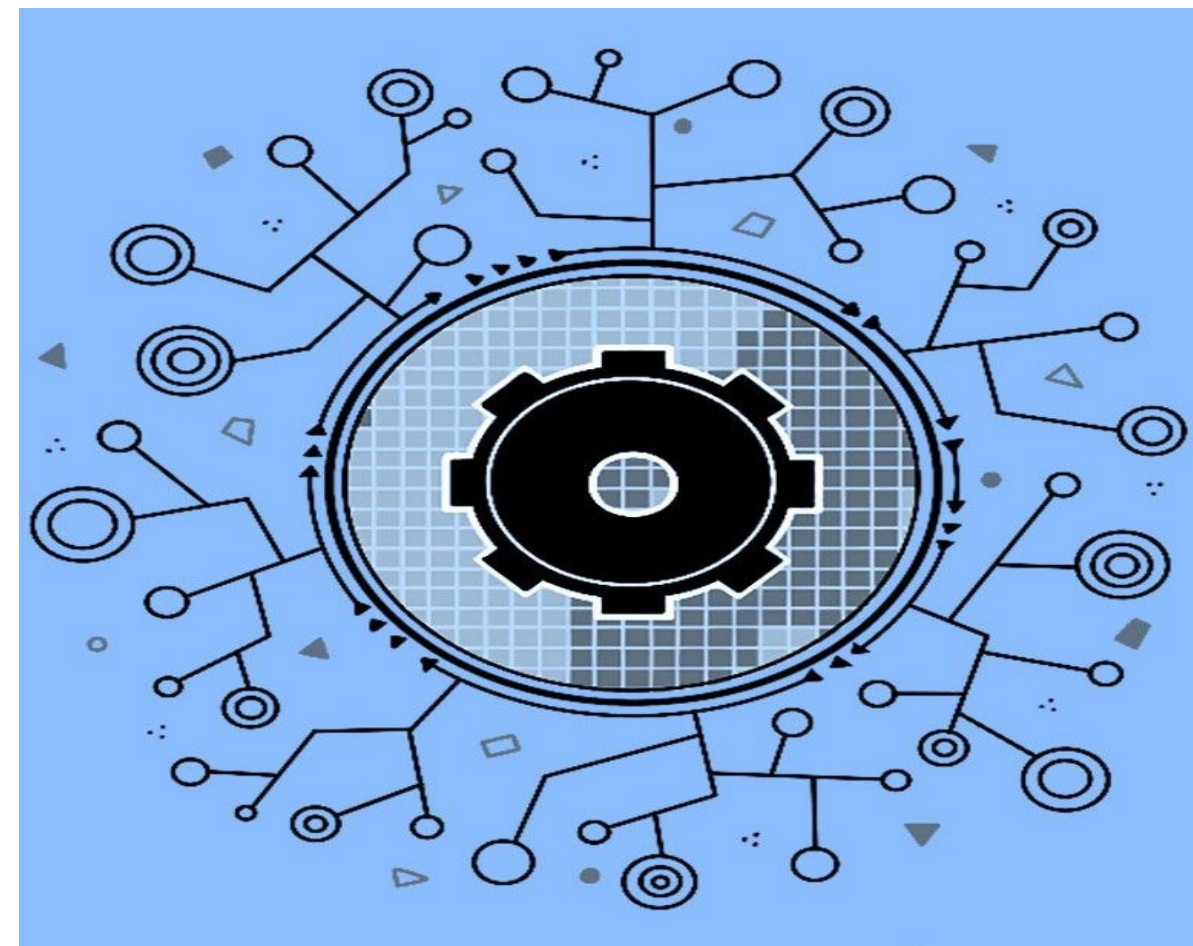
It is our belief that the present research in some way contributes to highlighting the relevance of algorithm literacy and AI comprehension for broadening of the content scope of media education.

Furthermore, user behaviour and data input play a key role in algorithmic decision-making, performed by the digital tools these users operate with. Users who have developed algorithm literacy are knowledgeable of the way in which algorithmically generated suggestions modify or filter online content.

Studies draw parallels between the structure, evolution and acquisition of natural languages and algorithmic rule-based logic. Further to that, language learning, can also be thought of as an algorithm-based process.



Methodology



The two-dimensional Algorithm Literacy Scale for Internet Users (Dogruel, Masur & Joeckel 2021), has been first trialed in Bulgarian settings. Further to that, a Generative Artificial Intelligence Models (GAIM) scale has been devised.

Specific alternative hypotheses were statistically tested:

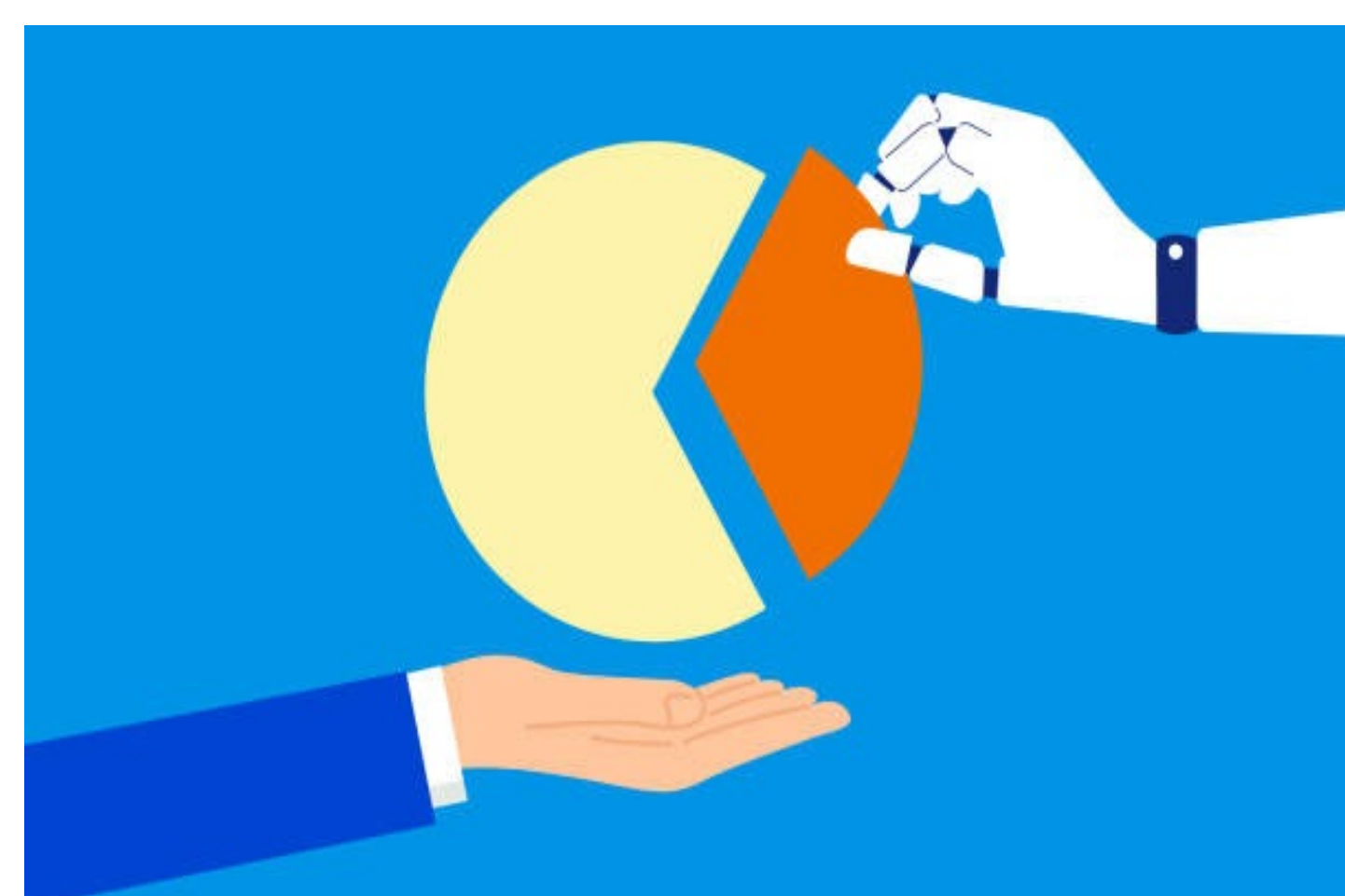
H1: Students in education will exhibit a comparatively low level of familiarity and usage of generative AI models.

H2: Students will exhibit a relatively high level of algorithm literacy.

H3: There will be meaningful association between the students' scores exhibited on the GAIM and the AL scale.

H4: There will be meaningful associations between the students' scores on GAIM, AL, LC scales, and their self-reported language proficiency level in English, their coding skills and year of university studies.

H5: There will be meaningful differences on the scales in relation to students' year of studies and major. In particular, students in media education and art communication will score higher on the GAIM and AL scales compared to their peers on the other university programmes.



Results

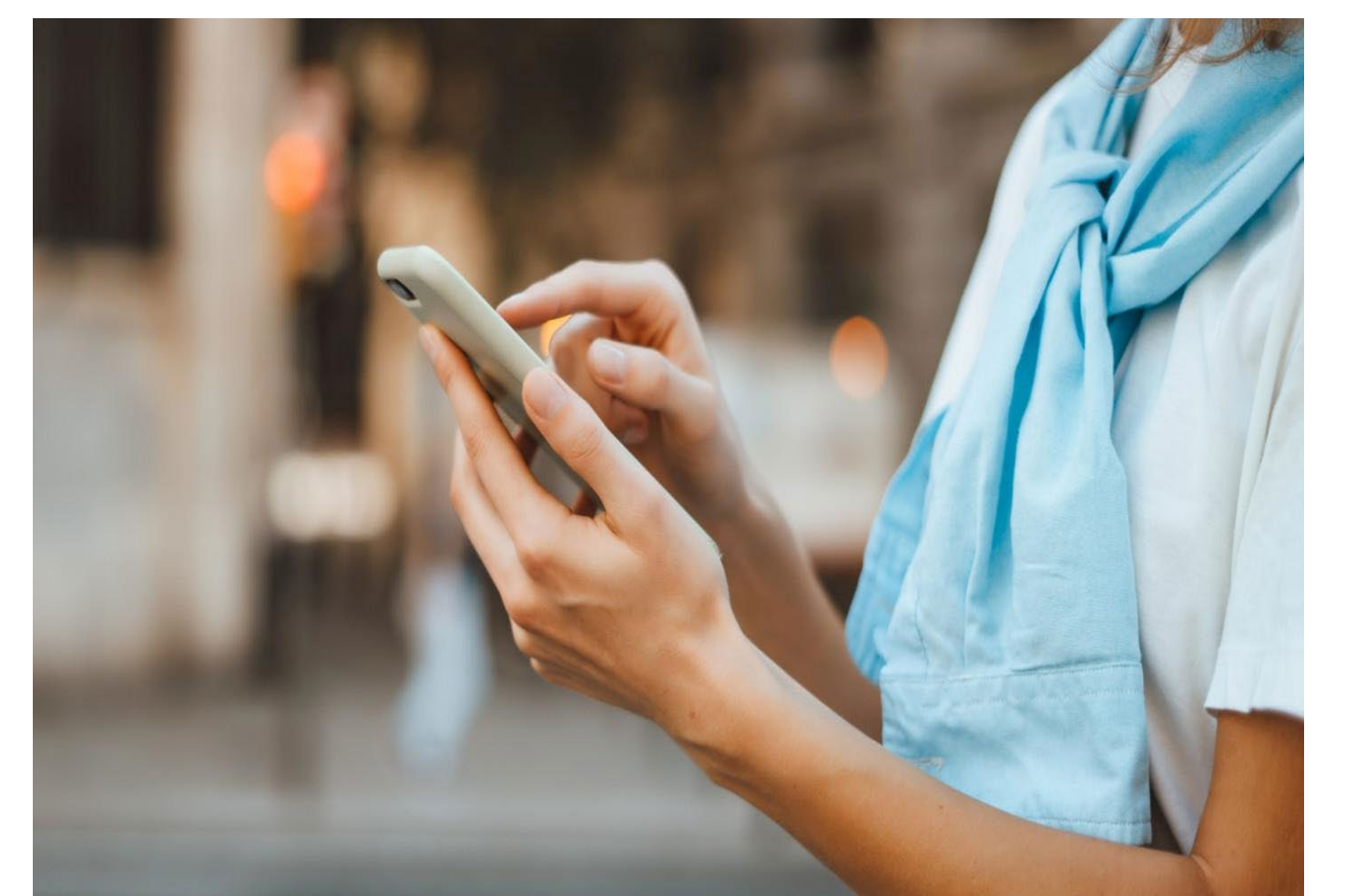
Congruent to our first two research hypotheses (H1 and H2), students on all programmes in education displayed relatively high level of algorithm knowledge and algorithm awareness.

Statistically significant correlations were found between the two subscales of the Algorithm Literacy Scale for Internet Users, as well as the GAIM scale and the algorithm knowledge subscale (H3). Also, as hypothesized (H4) students' proficiency level in English was positively related to the algorithm knowledge subscale and GAIM scale.

As hypothesized (H5), students in media education and art communication scored the highest on the algorithm knowledge subscale and the GAIM scale.

Students' knowledge and use of generative AI models displayed a negative association with students' year of studies at university which was quite expected.

Students with higher level of proficiency in English exhibited a more external locus of control, whereas students in their last years of studies at university displayed a more internal locus of control compared to those in the first years at university.



Conclusion

Comprehension of the uses and limitations of generative AI models as well as the understanding of how algorithms function fall within the wide scope of digital competences that educators need to cultivate in order to meet their learners' needs. It is our belief that knowledge of generative AI and skills in algorithm literacy will enhance the quality of materials and activities, designed by teaching professionals for pedagogical interaction with preschool and primary school children, as well as for creation of online media content for young audiences.

The findings of our research are consistent with results of other studies on the need of media literacy curricula to address in much greater depth how algorithms modify online content.

Additionally, the positive correlation between respondents' self-reported language skills and GAIM scale may be interpreted along the lines of suggested recommendations for inclusion of generative AI systems in language teaching as an additional interactive tool.

A larger study on students' language proficiency level, gender, university major, etc. in relation to these scales and other constructs may provide valuable educational insights. It could enhance understanding of young people's traits, skills, inclinations and preferences so that educators can accommodate their students' needs most effectively.

As suggested by the findings in this study, we remain in support of further research on and promotion of algorithm literacy and comprehension of AI technologies in order to ensure users' autonomy, knowledge and confidence. The present survey attempts to initiate a novel perspective to the understanding of how the educational process evolves within the new digital reality.

The implications of the established associations between the various constructs, explored in the study, merit further careful verification and consideration.