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Who supports or opposes the use of AI in educational and scientific contexts? An analysis of the role that knowledge and attitude has on the perception of the appropriateness of AI-use within the Austrian population

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Abstract

In this article we investigate in how far participants of an Austrian population survey (n=2302, summer 2024) deem the AI-use in the school and research contexts as appropriate. The data was collected via an online-access-panel survey on digital skills and competences, with a special focus on attitudes towards and knowledge on Artificial Intelligence. Participants had to indicate whether a specific scenario of AI use seems appropriate or inappropriate to them. Linear regression models on both – the school-related scenarios and the university/research-related scenarios – were calculated testing for effects of general technology commitment, digital competence, AI knowledge, experience and general attitude as well as controlled for socio demographics. Results show that socio demographics provide little, however surprising explanation for the assessment of the appropriateness of AI-use and attitudes and experience (in particular concerning AI) only partly do matter.

Note: The three waves of the Digital Skills Austria panel survey (2022-2024) were financed by the Austrian regulatory authority RTR (Rundfunk- und Telekomregulierungs-GmbH).

Keywords: *Artificial intelligence; digital competence; technology commitment; survey research; Austria.*

1. Introduction

Initially a pure technical development, the recent rise of generative Artificial Intelligence (AI) has led to the perception that AI is employed in all facets of society. Consequently, regulatory bodies started to establish policies like the *AI Act* (European Parliament, 2023); national and

organizational guidelines followed. Despite such legal and regulatory debates normative questions must be addressed, as a key part of the discussion around AI is about social processes and norms. In which situations and settings does society agree that AI-use is appropriate? Which forms of AI-use are deemed inappropriate? Generative AI resulted in many ethical questions about its capabilities and uses, including whether or when it is able or even should be allowed to outperform humans in certain tasks (cf. European Commission, 2019). Questions on the suitability of AI-tools for learning- and knowledge-driven environments remain unresolved, with no societal consensus. Especially, since the way AI acquires, and processes knowledge is not transparent to most outside the industry. This paper is based on a population survey from Austria, and we aim to illustrate what the population sees as appropriate AI-use in educational contexts (school and university & research) and identify what factors have an impact on opposing or supporting attitudes towards AI-use in these contexts among the population.

2. Background and Reasoning

For the Higher Education sector, the substantial shift in the availability and use of AI technology resulted in extensive and profound discussions. Debates range from legal and ethical issues such as academic integrity and plagiarism, to more practical considerations including the probabilistic nature of content creation with AI-based tools (e.g. McDonald et al., 2025). Empirical evidence shows that institutions (e.g. UN, EU and OECD) as well as leading universities adopted critical, but not necessarily negative positions on the emerging technology, as "they are focusing on the opportunities while simultaneously trying to address the emerging challenges in the field." (Dabis & Csáki, 2024, p. 10). Overall, a tentative agreement in academia is the importance of re-examining critical thinking and problem-solving skills, given AI's increasing presence in education (Ogugua et al., 2023). Yet, the way this shift results in assessment practices and pedagogical approaches remains subject of ongoing discourse. Educators seek guidance and regulatory frameworks that address the integration of AI-tools capable of text generation, information processing and other tasks traditionally associated with the formalized acquisition of skills and knowledge (e.g. Ruiz-Rojas et al., 2023).

At the same time, discussions about AI enter the academic digital skills and competence research. Research reveals relevant differences in how people use technologies around the world, including Europe. Significant competence gaps continuously highlight age, gender, and educational disparities (Palomino et al., 2025). Yet, on a national level, better performances seem to be linked mostly to humanistic education and lifelong learning (Labudova & Fodranova, 2024). In contrast, countries focusing on employability in digital skills acquisition often perform worse. Yet, for Austria it could be shown that technology commitment and positive and negative associations with digital technology provided sensible explanation for competence in the field (Gruenangerl & Prandner, 2023, p. 66). Recent findings indicate that this may also be true for the topic of AI (Gruenangerl & Prandner, 2024, p. 73).

3. Methods and Data

The analysis in this paper is based on the dataset of the third wave of the *Digital Skills Austria* panel study (Gruenangerl & Prandner, 2024), which is a CAWI survey conducted in July/August 2024 using an online access panel. The sample (n=2302) matches the Austrian resident online population according to age, gender, education, and regional distribution (see Gruenangerl & Prandner, 2024, pp. 18-20 for details). The annual focus of the third wave of the study was set on the attitudes towards and experiences with AI. A central element of the study were eight vignette-based scenarios of AI-use, each vignette representing a different area of everyday life[1]. For each area four different precise descriptions of possible AI-use were provided, asking the participants to assess if AI-use is appropriate in such a situation.

To discuss the research question stated in the first section of this paper[2] two linear regression models were set up. The dependent variables for these models are based on factor variables, extracted via explorative PCA, each consisting of four items dealing with the vignettes from the areas school and university/research each. One factor per area was extracted. Questions on the intensity of AI-use among the population, the general attitude towards AI rendering between enthusiasm and worries and a test of AI-knowledge were adapted from Kennedy et al. (2023) and serve as independent variables in the regression models. Like the vignettes the used AI-knowledge test confronts participants with scenarios from six areas of everyday life. Participants had to identify which of the listed everyday technologies are AI-based. Additional data points used as independent variables are: (a) the survey's digital competence test, which consists of thirteen tasks where the participants needed to apply their digital skills to solve an everyday problem using digital technology[3]. (b) the 12-item scale on technology commitment developed by Neyer et al. (2016) assessing generalized attitudes towards digital technology, that were collapsed into three dimensions: technology acceptance (TC1), measuring people's enthusiasm confronting technology, negative perception of technology competence (TC2), dealing with anxiety and overload concerning technology, and technology control convictions (TC3), relating to overcoming technology-related problems. Finally, control variables include demographics (see Table 1 for more details).

[1] The eight different areas of scenarios where school, university & research, tourism & work, medicine, job application, e-commerce, journalism and public administration. Only the first two scenarios were used for the calculations in this paper. Further information on and clarification of the specific scenarios are summarized in Gruenangerl & Prandner (2024, pp. 60-62). A five-point-scale was used by the respondents to assess whether the use of AI was very appropriate or very inappropriate in this particular situation.

[2] For all calculations in this paper SPSS Statistics, Version 29, was used as a tool for statistical analysis.

[3] The complexity of the test included a higher drop-out risk of the participants. It was only given to half of the sample resulting in a smaller subsample of n = 1159 for the digital competence test. It has been conducted twice and was validated for the study (see Gruenangerl & Prandner, 2023, pp. 21-22 and 2024, pp. 22-23)

Table 1: Overview of variables used for analysis (*Digital Skills Austria* 2024, own calculations, deviations from 100 % occur due to commercial rounding).

Dimension	Variable/Question	Scale	Mean (Med.) % coded 1
Scenarios of potential AI use (school & university/research)			
SCHOOL	school (n=1133)	PCA, tot. var. expl. 55 %, KMO 0,695, α 0,719, 1 factor	
UNIVERSITY	university & research (n=1165)	PCA, tot. var. expl. 56 % KMO 0,693, α 0,732, 1 factor	
Digital Competencies and AI Knowledge			
DC	sum-variable of 13 competency tasks (n=1159)	0 to 13 tasks completed	5,0 (5)
AIK	sum-variable of AI-knowledge tasks (n=2302)	0 to 6 AI-tools identified	1,8 (1)
Technology commitment			
TC1	technology acceptance (n=2162)	PCA, tot. var. expl. 74 %, KMO 0,830, α 0,879, 1 factor	
TC2	technology competence (n=2163)	PCA, tot. var. expl. 76 %, KMO 0,836, α 0,893, 1 factor	
TC3	techn. contr. convict. (n=2127)	PCA, tot. var. expl. 63 %, KMO 0,797, α 0,805, 1 factor	
Sociodemographic variables (Control variables)			
Age	age in years (n=2302)	14 to 93 years	46,8 (46)
Gender	male or female? (n=2302)	1 (female) / 0 (male)	52 %
Education	less than lower secondary education (n=1403)		61 %
	secondary education (n=488)		21 %
	tertiary education (n=397)		17 %
General attitudes towards AI-use			
AI exp.	Previous experience with AI	1 (very intensive exp.)	18 %
		2 (some exp.)	53 %
		3 (little or no exp.)	30 %
AI att.	General attitude towards AI	1 (more excited than worried)	16 %
		2 (more worried than excited)	44 %
		3 (equally excited & worried)	38 %

4. Results

The survey highlights that for the Austrian online population AI is still linked to unawareness and uncertainty. The results from the AI-knowledge test demonstrate that participants often lack clarity regarding the AI-driven nature of specific tools: on average, only 1 in 6 AI-applications was identified, 34 % of the survey population could not identify one single scenario correctly. Education, age, and gender are key factors in test outcomes. Men aged 31 to 65 as well as people with tertiary education scored higher than the rest of the online population (for more details see Gruenangerl & Prandner, 2024, pp. 54-56). When asked about AI in general 30 % had never or barely dealt with the topic so far while only 18 % exhibit an intensive involvement with AI. This is consistent with the finding that 43 % reported no or rare interaction with AI in their daily lives. Consequently, it is unsurprising that the Austrian online population's attitude towards AI in everyday life remains rather reserved: for 44 % worries outweigh enthusiasm, only 16 % are rather excited than worried (Gruenangerl & Prandner, 2025, p. 58-59).

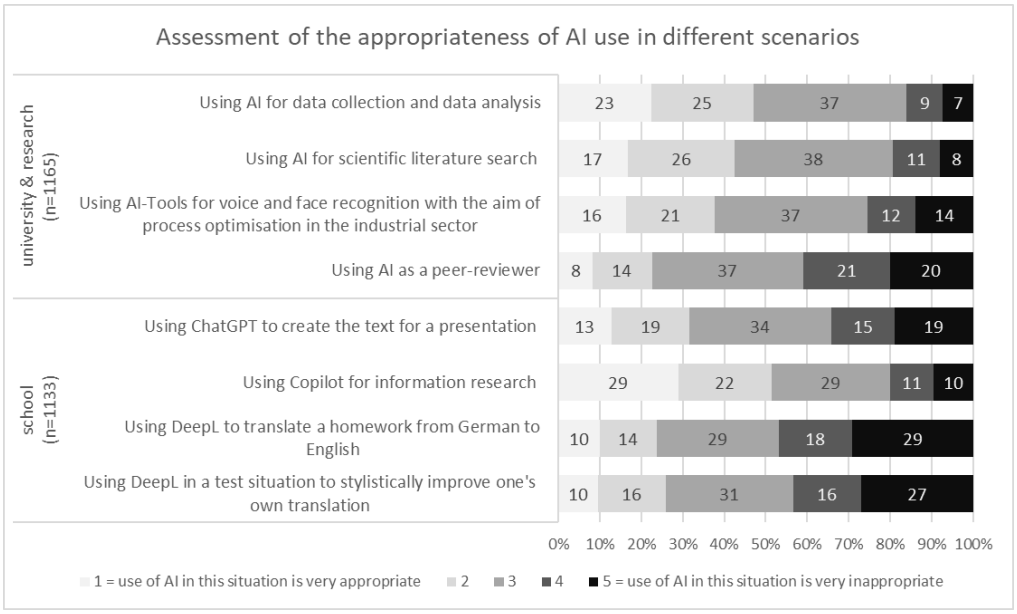

Figure 1: Overview of the scenarios of AI-use in educational and research contexts.

Examining the scenarios of AI-use reveals consistent patterns. Within the research & university scenario the opposition to AI-use is highest when it comes to using AI as a peer-reviewer for publishing scientific results: 41 % rather oppose this application of AI. AI-support for data collection and analysis as well as literature review but also within industrial process optimization was more positively received. These results must be seen in context, since most participants are not academics and likely to judge the scenarios from a layperson's normative perspective. Within the school scenario AI-support for translation tasks (no matter if for stylistic improvement or the pure translation process itself) is perceived more negatively than the application of AI-tools for generating manuscript texts for presentations. The highest level of appropriateness of AI-support in schools is reported when it comes to information retrieval (see Figure 1 for details).

In addition, linear regression models were used to explore which factors influence people's perception of AI-use keeping in mind the rather reserved and unexperienced attitude of the Austrian online population. Concerning the appropriateness of AI-use in the school context (model 1) people with higher worries about AI in general also tend to see it rather inappropriate in the school context. The second negative effect relates to tertiary education. This means that those who spent more years in the educational system tend to view AI-support in the learning context more critical than those with the lowest education degrees. Conversely, people in the 66+ age group, whose own school careers are furthest away from those of today's students, tend to see AI-use in schools with greater appropriateness. Furthermore, people who engage with AI

in a more profound way tend to perceive the scenarios of AI-use in the school context as rather suitable. Considering technological motivation, technology enthusiasts rather support AI-use in school but surprisingly also people with high technology anxiety, who tend to be overwhelmed by technology. These results, indeed, need further discussion. They do not only suggest that AI is treated differently to other technological innovations but also imply different experiences with the school system (longer time since graduation, spent more time in the educational system) lead to different AI-related assumptions. Digital competence and AI-knowledge do not have a significant effect on the judgement of appropriateness of AI-use in schools, at all.

Table 2: Linear regression models on scenarios of AI-use.

independent variables		dependent variables			
		school		univ. & research	
Dimension	Indicator	std. Beta	sig. (p)	std. Beta	sig. (p)
sociodemographic variables	gender (ref.:male)	-0,061	0,182	0,062	0,175
	secondary education (ref.: less)	-0,029	0,544	-0,053	0,256
	tertiary education (ref.: less)	**-0,105**	**0,029**	-0,080	0,090
	age 31-45 years (ref.: up to 30)	0,054	0,351	0,069	0,233
	age 46-65 years (ref.: up to 30)	0,019	0,763	**0,127**	**0,040**
	age 66+ years (ref.: up to 30)	**0,127**	**0,028**	**0,209**	**<0,001**
DC	Digital competence test	0,068	0,211	**0,168**	**0,002**
AI-related items	AI knowledge test	-0,087	0,092	-0,022	0,655
	Intensive AI-experience (ref. none)	**0,134**	**0,023**	0,019	0,749
	Moderate AI experience (ref. none)	0,087	0,103	0,069	0,191
	AI excitement (ref. neutral)	0,095	0,061	0,083	0,111
	AI worries (ref. neutral)	**-0,131**	**0,006**	**-0,177**	**<0,001**
technology commitment	TC1 technology acceptance (+)	**0,146**	**0,010**	0,089	0,122
	TC2 technology competence (-)	**0,110**	**0,024**	0,061	0,210
	TC3 technology convictions (+)	-0,094	0,082	-0,009	0,868
model summary	adjusted R^2		**0,116**		**0,107**
	Sig. (p)		<,001		<,001
	n =		494		507

Digital Skills Austria 2024 dataset, own calculations, no weights applied.
Method: linear regression models on (1) the school scenarios (2) the university & research scenarios (factor variables). Significant effects ($p < 0,05$) are marked bold.
The model prerequisites regarding the Gauss-Markov assumptions were examined through graphical and/or mathematical means for both regression models, and it was ascertained that they were satisfactory. This process entailed verifying the homoscedasticity, the linearity of the independent variables, and the normal distribution of error values.

The overall results suggest that in future research further aspects of learning and information proceeding habits must be considered for a more profound explanation of the people's

assessment of AI appropriateness in the school context. This may possibly lead to additional insights, as the current model only has an R^2 of 12 %.

When it comes to the assessment of the appropriateness of AI-use in the university and research context (model 2) we see different effects. Again, high AI-concerns have a negative effect, resulting in a negative assessment of AI-support for university and research purposes. A positive effect derives from age: people in the age groups over 45 assess the appropriateness of AI-use more positively than the reference age group of up to 30 years. In addition, higher digital competence also contributes significantly to a positive attitude towards AI-support in university and research scenarios. Surprisingly, neither technology commitment nor AI-related aspects (high AI-involvement or AI-knowledge) have a significant effect on this scenario leaving the overall model with a moderate explained variance of 11 % (R^2).

5. Conclusions

The results of the study demonstrate that the use of AI in educational and research contexts is seen critical, but also nuanced by the Austrian population, who is generally barely aware of developments in the field of AI. While tasks like data and information processing or literature research are seen as somewhat unproblematic, translation tasks, stylistic improvements or feedback are contested. This shows that the use of AI is not in general declared as problematic or unproblematic, but differentially judged – case by case. AI-driven knowledge processing is seen as less of a problem than the performance of operational tasks through AI-applications. This matters as it highlights that the normative assessment of what technology should be used for is not uniform and understanding the use cases and assumptions of those involved is central. Especially for our school scenario it becomes evident that the expectations are not split uniformly: While those that are older or afraid of technology are seemingly okay with using AI in education, highly educated people are not that much. This hints at the fact that AI is not seen primarily as a further technological innovation by people but as a potential disruptor of our understanding how to acquire, share and process knowledge. It opens new debates for the field of educational research and institutional learning/teaching environments as it requires us to re-evaluate the importance of humanistic ideas and the basic principles of the Enlightenment (such as critical thinking, autonomy and self-determination) in the aftermath of algorithmic knowledge processing. On an institutional level this implies that guidelines must emphasize rather the critical assessment of AI technologies concerning their impact on knowledge acquisition. On an individual level it refers to personal strategies of fact evaluation and human autonomy. On a societal level it shows the necessity for a broader debate on which tasks and skills can and should be outsourced to technology.

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