Aralık 2024 Cilt 26 Sayı 2 (669-688)
DOI: 10.26468/trakyasobed.1478054 Derleme Makalesi/Review Article

THE SENSE OF AGENCY IN THE USE OF GENERATIVE AI SYSTEMS IN EDUCATION FROM A SOCIAL IDENTITY THEORY APPROACH

EĞİTİMDE ÜRETKEN YAPAY ZEKANIN KULLANIMINDA KONTROL DUYGUSUNUN SOSYAL KİMLİK KURAMI ÇERÇEVESİNDEN DEĞERLENDİRİLMESİ

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Geliş Tarihi: 14.05.2024 (Received) *Kabul Tarihi: 03.09.2024 (Accepted)*

ABSTRACT: Social identity theory is widely accepted to explain intergroup relations for any group. Decisions are influenced by people's social identity which moderates the agent's sense of agency -one's feelings of controlling their own actions; therefore, both should be considered while investigating human-generative AI interactions and possible challenges that arise from them. This review starts with discussing human-AI interactions in terms of Social Identity Theory; then, focuses on the sense of agency that plays out in human-AI interactions moderated by social identity; and finally, discusses consequences that would be raised from these correlations. Accountability is one of the concerns related to human-AI interaction. The diversity of the users and the data is another concern. We conclude the review by suggesting a future direction for empirical research on social aspects of the sense of agency in human-AI interactions and provide possible solutions to ethical and social concerns regarding the use of generative AI systems.

Key Words: generative AI; sense of agency; social identity theory; education; intergroup relations; diversity

ÖZ: Sosyal kimlik teorisinin herhangi bir grup için gruplar arası ilişkileri açıkladığı yaygın olarak kabul edilmektedir. Kararlar, kişilerin sosyal kimliklerinden etkilenir; bu da, kişinin kontrol duygusunu -kişinin kendi eylemlerini kontrol etme duygusu-etkiler; bu nedenle, insan ve üreten yapay zeka etkileşimleri ve bunlardan kaynaklanan olası zorluklar araştırılırken her ikisi de dikkate alınmalıdır. Bu inceleme, insan-yapay zeka etkileşimlerinin Sosyal Kimlik Kuramı açısından tartışılması ile başlıyor; daha sonra sosyal kimliğin gruplar arası etkileşimindeki önemini özellikle insan-yapay zeka etkileşimlerinde ortaya çıkan kontrol duygusuyla bağdaştırarak tartışarak devam etmekte. Son olarak bu korelasyonlardan ortaya çıkabilecek sonuçları tartışmaktadır. Sorumluluk, insan-yapay zeka etkileşimiyle ilgili endişelerden biridir. Kullanıcıların ve verilerin çeşitliliği başka bir endişe kaynağıdır. Makale, insan-yapay zeka etkileşimlerinde kontrol duygusunun sosyal yönlerine ilişkin gelecekteki görgül araştırmalar için öneriler sunarak ve üretken yapay zeka sistemlerinin kullanımına ilişkin etik ve sosyal kaygılara olası çözümler önererek sonlandırılmaktadır.

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Anahtar Kelimeler: üretken yapay zeka; kontrol duygusu; sosyal kimlik teorisi; eğitim; gruplar arası ilişkiler; çeşitlilik

EXTENDED ABSTRACT

A number of psychological studies have provided valuable insights into the ways in which humans and generative AI (GAI) interact. Nonetheless, the majority of research employed a computer science or cognitive viewpoint. This may have led to the exclusion of contextual concepts in intergroup connections from the investigation. In this instance, our suggestion would be to propose that academics do an empirical investigation of the social environment of human-AI interactions. Given that every group employs AI for a different set of reasons, inter-discipliner research on the topic is more essential than ever. Thus, to have a deeper understanding of how various groups of people view AI, investigations should examine contextual factors. An interdisciplinary approach must be taken, for instance, when examining the loss of agency due to artificial intelligence. In this sense, we addressed the issues of diversity, accountability, and sense of agency from a social identity viewpoint in our review. Social identity theory is widely accepted to explain intergroup relations for any group. Decisions are influenced by people's social identity which moderates the agent's sense of agency -one's feelings of controlling their own actions; therefore, both should be considered while investigating human-generative AI interactions and possible challenges that arise from them. Therefore, the main goal of this review is to investigate the challenges derived from generative AI use in education in regard to the sense of agency from a social identity standpoint. Consequently, the aim is to efficiently shape generative AI as a better learning tool for all participants. The importance of this review is to open a discussion on how people in education can improve the generative AI experience for students (and instructors) to learn and deliver more efficiently. To do so, it is essential to mention how humans as agencies are interacting with other groups since generative AI can also be accepted as an agency. Thus, another important point of interaction between humans and generative AI would be the sense of agency, one's feelings of controlling their own actions. In our review, we brought these two different lines of research in order to discuss the possible challenges that might be raised through human-AI interactions specifically in educational settings.

Research on human-AI interactions indicates that there might be several challenges that need to be addressed. One of them is regarding accountability. In our review, we discussed the accountability issue from a social identity and sense of agency standpoint. Sense of agency studies have suggested that our sense of control might change depending on the contextual factors that we are surrounded with. One of the most vital factors is our social identity. When we think of human-AI interactions as a social encounter, specifically when we cooperate with them, our social identities will be activated, which will also impact our sense of agency. There could be the accountability issue that might kick in. Human-machine studies show that when individuals use machines, even when the machine performs better than they do, they are more likely to ascribe good outcomes to their efforts and negative outcomes to the machine (Wen et al., 2015). When an activity has a positive outcome, the person accepts responsibility for it. But when it's unpleasant, people tend to "blame" or hold the surroundings accountable for the unfavorable outcomes. Therefore, it's intriguing to observe where the beginning of the sensation of agency occurs while collaborating with GAI.

This means that a careful analysis of how GAI affects a person's sense of agency is necessary. Another important concern regarding human-AI interactions is the diversity. When humans rely on generative AI, their level of sense of agency might fluctuate. This fluctuation could have an impact on attitudes towards the usage of generative AI systems. Therefore, this is also essential to discuss since the usage of AI can increase by some groups and not by some other groups means the diversity issue of both who uses AI and where the AI gathers the information from is an important subject that has been investigated. In our review, we discuss these concerns in depth. Finally, we concluded the review by suggesting future direction for empirical research on social aspects of the sense of agency in human-AI interactions and provide possible solutions to ethical and social concerns regarding the use of generative AI systems.

1. INTRODUCTION

The use of generative AI systems, particularly those that produce art, pictures, movies, and material, has recently increased dramatically. Generative artificial intelligence (GAI), in its broadest sense, refers to technologies that use trained or untrained Large Language Models to produce information that resembles that of humans. Although it has been in use for a while, the GAI discussion really got underway in November 2022 when OpenAI launched ChatGPT. The main focus of the debate centres on the moral implications of using generative AI. ChatGPT is one of the most intelligent and approachable generative AI model technologies currently available. It can support natural conversations and generate creative works and practical content in response to requests. Some claim that highly developed GAI can pose a plagiarism and originality risk (King, 2023). Some question whether using AI-generated content constitutes plagiarism (Kleebayoon & Wiwanitkit, 2023). Others contend that GAI technologies can boost creativity by enabling speedier creation from artists and scientists, therefore should be embraced rather than shauned (Lim, et al., 2023). These are not the only issues, though. To successfully incorporate GAI into daily life, particularly the educational system, studying the socio-psychological aspect of the story between humans and AI is necessary. In this review, we concentrate on the social-psychological aspects of human-AI interaction, particularly in the context of education, and assess the possible benefits and downsides provided by generative AI systems by drawing on evidence from sense of agency and social identity theories.

Research on human-AI interactions has been concentrated on the AI perspective to make the AI more human-like and ultimately more acceptable to society (Hois, Theofanou-Fuelbier & Junk, 2019; Sundar, 2020; Wen & Imamizu, 2022; Wienrich & Latoshchik, 2021; Veitch & Alsos, 2022; Zanatto, Chattington & Noyes, 2021). However, more thorough research on the human perspective must be conducted. Few studies have examined how people view AI, and how it interacts with humans. According to social psychological studies, a person's identity greatly affects how they show themselves to others as well as how they view the other party

to the contact (Hogg, 2016; McLeish & Oxoby, 2011; Miller, 1962; Neville, Novelli, Drury, & Reicher, 2022). The identification should therefore be one of the most crucial considerations when talking about AI-human interaction (Wen& Imamizu, 2022). The sense of agency is closely related to identity since it influences perception, conduct, and the environment around us (Wen & Imamizu, 2022; Wen & Haggard, 2018). According to Georgieff and Jeannerod (1998), a diminished sense of agency may cause a change in our identities, or vice versa. In this vein, we address the sense of agency in GAI-human interactions within the framework of Social Identity Theory in this paper. Our goal is to explore this interaction in the context of education by concentrating on the effects of how a user's identity and sense of agency interact with GAI. Therefore, in this review we focus on accountability and diversity as the effects of how an individual's identity and their sense of agency interact with a generative AI.

2. SOCIAL IDENTITY THEORY IN HUMAN -AI INTERACTION

There are many social groups in our environment, and we identify with several of them. We are a part of those social groups in every aspect of daily life, including every choice we make, action we take, and emotion we experience. Our responses to the question "Who are you?" are highly correlated with our social identities. Furthermore, we modify our actions in response to social cues about the identity and self-presentation of others. The Social Identity Theory (SIT) has studied how the social group memberships we belong to affect how we interact with people from other groups.

The social identity theory (SIT) is a well-researched theory from the field of social psychology that has grown in popularity and credibility because of studies using valid data (Abraham & Hogg, 1988; Emerson & Murphy, 2014; Hogg, 2016; Mealy, Stephan & Urrutia, 2006; Word, Zanna & Cooper, 1979). Studies have demonstrated how our social identities influence how we *see* others (Lewis & Sherman, 2003; Mealy, Stephan, & Urrutia, 2006), as well as how decisions are made on individual's social identities (Emerson & Murphy, 2014). For instance, research based on the SIT framework found that students have a *more* positive opinion of their instructors when they identify *similarities* between them and the instructors (Edwards & Harwood, 2010). This study can be used to illustrate how our identities and those of others affect how we make decisions and how we see people in social situations. Additionally, research has shown that group identity influences student participation in the classroom, which is significant for group projects and collaborative work (Harwood, 2006; Kelly, 2008). Evidence also suggests that academic success is predicted by a sense of connection to the school environment (Reynolds et al., 2017). Minority students, in particular, are more prone to segregate themselves and stop participating in school activities when the environment disregards *or* undervalues their social identities (Derks, Van Laar &

Elemers, 2007). Research implies that social identity-based interventions could improve intergroup relations in educational settings, drawing on the findings that social identity is a crucial component of school engagement and academic achievement (Scheepers & Ellemers, 2019). Moreover, studies in educational settings with a social identity approach suggest that simulating an intergroup relationship as between members of the same group enhances the outcomes of the interaction (Vezzali et al., 2015). Furthermore, research using the social identity approach in an educational context suggested that students' perceptions of a shared sense of identity may have an impact on how they use technology in the classroom (Bowskill, 2013). This suggests that teachers must coordinate social identity with classroom management to foster a learning environment.

In fact, research suggests a connection between social identity and technological use. A study looking at how employees' views of group membership affect how well new information technology changes an organization shows that social identity beliefs justify current institutional arrangements in the face of the promise of new technology (Schwarz & Watson, 2005). These findings imply that existing social identity perceptions may prevent new technological changes from taking effect, hence social identity processes should be taken into consideration when implementing new technology in organizations. In line with this evidence, a study examining the relationship between social identity and technology acceptance discovered a significant influence of self-identification, both directly and indirectly, on technology adoption (Lee et al., 2006). According to a different study, teachers' self-perceptions influence how they see technologies, and how they use them in the classroom (Dele-Ajayi, 2019; Mazman Akar, 2014). This implies that social identity theory is also essential for comprehending human GAI interactions in educational contexts and incorporating GAI systems into the curriculum. Some researchers go even further in their usage of GAI in education and state that robot teachers may become commonplace soon (Edwards & Cheok, 2018). One issue they delivered, though, is that while interacting with the students, GAI systems lack social presence and social agency.

Recent studies also used the SIT framework to examine the function of identity in generative AI-human interactions. For instance, Edwards and their colleagues investigated whether students' motivation to study was affected by how they interpreted the voice of an AI instructor (Edwards et al., 2019). They discovered that the more closely the students identified with the AI instructor's voice, the better ratings of trustworthiness and consequently, the greater intent to learn they expressed. Researchers in another study looked at the similarities and differences between human-human and human-AI interactions (Mou& Xu, 2017). They discovered that when people interacted with a human rather than an AI, they were more open, friendly, extraverted, and self-disclosing. This supports the notion that

social identity plays a big role in how people engage with generative AI systems. Researchers made the claim that building socio-cognitive AI can be more credible to people by using data from SIT and human-AI interactions (Prada et al., 2012; Rato &Prada, 2021). Socio-cognitive refers to agents that have a social identity and sense of agency. This is particularly important for joint actions with generative AI systems. Also, cyberpsychology research indicates that positive technologies can promote connectedness between individuals, groups, and organizations, which might also apply to interacting with generative AI systems (Riva & Gaggioli, 2015). This might be achieved however by the balanced interaction of two agencies where AI has also self-identification. Research addressing robot self-identification from the standpoint of social identity theory indicated that designing robots with a sense of identification could increase the acceptability of AI systems in daily life (Seaborn, 2022). However, to achieve these social capabilities, AI should be designed with the skills of assessing social cues and complex social identities in their environment. They suggest that we are very far off from achieving robot self-identification. Indeed, a study that focuses particularly on chatGPT and human interaction asks whether people regard GAI as a danger to human identity and found that when people perceived GAI as more competent than they were, they rated it as a threat (Ognibene et al., 2023). In general, social identity plays a significant role in human-AI interactions because it influences how individuals *engage* with, *work* with, and *use* GAI.

Since our sense of agency affects our behavior, perception, judgments and decision-making processes, the sense of agency and our identity have a strong connection (Wen & Imamizu, 2022; Wen & Haggard, 2018). As a result, reductions in our sense of agency might lead to changes in our social identities, or vice versa, as claimed by Georgieff and Jeannerod (1998). Using GAI to some extent requires loss of sense of agency as it is a tool that is not completely in our control. Even though it is not entirely within our control, the things we create using GAI can serve as a representation of our identity. Social Identity Theory suggests that we are very concerned about how we are perceived and how positively we are judged by others. For example, our ability to complete an assignment successfully shows how smart we are perceived to be. Our sense of agency will consequently grow when we believe that we will be seen as smarter, which will positively boost our social identity. Thus, we might not experience any problems when utilizing GAI. For instance, when performing a task that doesn't threaten their social identity, a person who feels competent in a foreign language might use GAI without losing their sense of agency. However, it would be problematic if someone felt completely helpless in a foreign language, and lost any sense of control over the GAI, which may lead to accountability issues. Furthermore, as individuals with a strong sense of agency are

more likely to use the GAI tools, this issue would further highlight the diversity issue.

The sense of agency component of human-AI interaction has received relatively little attention in empirical research. There are few reviews on the sense of agency in human-AI interaction. The reviews, however, have not specifically linked the agency's social features. One review focused on the impact of agency on perception and action during human-AI contact (Wen & Mamizu, 2022). The other is examining the elements that can improve the sense of agency in interactions between humans and AI (Pagliari, Valérian, & Berberian, 2022). We hope to start a conversation regarding the sense of agency and how it affects how people engage with AI in this essay using the social identity approach in the context of education. As a matter of sense of agency and social identity, research indicates that two primary issues surrounding the employment of AI would be accountability and diversity. Consequently, in relation to the sense of agency and social identity research, we will go into more detail about these two significant issues.

3. SENSE OF AGENCY AND ACCOUNTABILITY CONCERN IN HUMAN-AI INTERACTION

Recent studies have focused more on examining accountability in cooperative and human-generative AI interactions. For example, in a study, they found that while having AI partners who performed better, members of the accountability group shared more resources with them, took longer to make decisions, and underperformed individually (León et al., 2020). This finding suggests that when people must justify their decisions in the end, they interact more with their AI partner and pay more attention to the decision-making process. This data can be applied to educational contexts as a strategy for how to integrate generative AI systems to collaboratively work. Imagine a scenario where students are not allowed to use AI or are degraded for using GAI for their assignment, they probably will use it but won't acknowledge the contribution of AI. Also, the effort of the student will diminish. However, if a lecturer encourages using AI but expects students to justify their proposed decisions, students will spend more time creating it, and consider more of the consequences of their work. Therefore, rather than banning generative AI from education, we may accept, and develop arrangements around it to use it efficiently. The sense of agency is once more an essential component since without it, people cannot be held accountable. One of the two agents in a cooperative work has a sense of agency. The agent with the agency in this situation—the student—must be considerate of the consequences of the action.

According to human-machine studies, when people work with machines, they are more prone to attribute positive results to their activities and bad consequences to the machines, even if their performance is worse than the machine's (Wen et al., 2015). The person takes responsibility for the action when the consequence is

favourable. When it is unpleasant, however, people frequently "blame" or hold the environment responsible for the negative results. It is, therefore, interesting to see where the sense of agency starts when working collaboratively with GAI. The impact of GAI on one's feeling of agency must therefore be thoroughly examined. When the chatGPT is used as a tool, for example, it may positively improve one's view of their own creativity, and therefore boost one's sense of agency, which may also help people to generate sufficient work. As you can see when people work with AI, they might create better work and their perceived sense of agency might increase; thus, this might result in an accountability problem, which can be resolved by requiring justification of their decisions or accountability pressure (Leon et al., 2021).

We already know that chatGPT delivers extensive responses to issues or topics that most people do not consider. It is something a person may work on, using the information provided by chatGPT to generate some ideas that are novel or authentic on the subject. They may feel responsible for the intended outcome as the previous studies summarised above, that's what people do (Wen et al., 2015). While we would like to emphasise the importance of coming up with an authentic idea, we would also like to advocate the accountability of the agency. The fact that the person has a strong sense of agency does not imply that the authentic or original concept was entirely created by that person. However, GAI would unquestionably be a useful tool for a person to come up with that concept, which we feel is why all tools are designed. So, what we try to explain here is that the ability to use a sophisticated tool for personal development is important and the GAI could be very helpful to establish that. However, it is again an accountable issue. Finding a strategy to resolve the accountability issue might improve the creative ideas and unique works. Generative AI makes research and information more accessible to laypeople, which may lead to an increase in an individual's sense of agency to access that information. Then, an increased sense of agency could lead to simpler use of a GAI system for a person. This will undoubtedly and rapidly change the way we communicate, demonstrate, and create (Hacker et al., 2023). The use of AI in various situations, as well as the accountability that comes with it, is extensively debated in the literature. According to studies, laypeople and technologists considered the GAI system as an agent, while artists and curators considered it as a tool (Epstein et al., 2020), indicating that the disputes are still ongoing. However, in educational contexts, we believe that when people have access to a chatbot that provides information in a more nuanced and sophisticated way, they can utilise this information to polish up their own ideas. Because the GAI helps them improve the quality of their own outcomes, they may be more inclined to use the GAI due to the rewarding system of a sense of agency (Wen & Imamuzu, 2022). On the other hand, a non-native speaker who wants to write an essay on a hard topic. Because they potentially have a low sense of agency for writing an essay in another language, they can use chatGPT to organise their

thoughts, compose a good quality essay, and ultimately receive a higher grade. As a result of employing GAI, they can feel competent in their work although they previously felt less competent due to a low sense of agency. The student is sure that the essay is their own work, even though they collaborated with AI completely. As research indicates people are more likely to own the action when it has favourable consequences for them. In the student's case, they might be more willing to own the work without mentioning the help of GAI, which might be deemed as plagiarism. On the other hand, since their sense of agency decreased by using another language, they are more concerned about the competency of their work. According to sense of agency studies, people with a high-level sense of agency are more concerned with the moral repercussions of their actions (Moretto, Walsh & Haggard, 2011). The solution to this issue could be that students are informed about the GAI use in their work instead of forbidding them to use it. There could be AI literacy courses for students. People would be hesitant to share their agency with non-human agents (Berberian et al., 2012; Parasuraman, 1997). An empirical study: in line with the previous studies, demonstrated that when people perceive GAI systems to be more accountable, trustworthy, transparent, and explainable, they are more willing to employ them (Shin, 2020).

Some other factors may influence the level of agency. One of the factors is the uncertainty of the outcome of the activity. The other aspect is competence. A study on social judgements and sense of agency reveals a link between how people perceive others which affects the level of agency. (Louvet et.al., 2018). In this vein, the relationship between perceived competency and a sense of control should be investigated further to better comprehend the accountability aspect. Aside from social judgments, the level of uncertainty is also related to a sense of control (Vatrepotte et al., 2022). Competence may be crucial when specific outcomes are present. If the individual sees the AI to be more capable, they may give up their feeling of agency. However, if people believe they are competent enough in a certain environment, they may be unwilling to risk employing GAI to provide adequate results. This, however, needs to be researched further in the context of human-AI interactions. To accomplish so, it is critical to emphasize that the context will differ for different groups; thus, the level of sense of agency will most likely differ between groups, affecting their interaction with GAI. Furthermore, accountability of AI algorithms is critical for diversity issues. In order to be considered an accountable algorithm, AI software should eliminate biases that emerge from taught data and make themselves more inclusive and trusted by users (Porayska-Pomsta & Rajendran, 2019).

4. SENSE OF AGENCY AND DIVERSITY CONCERNS IN HUMAN AI-INTERACTION

We asked chatGPT what the key AI-related worries were, and it responded with the following: job displacement, bias and discrimination, security and privacy, autonomy and control, and finally ethical worries like accountability, transparency, and responsibility. When we question whether its resources are credible, ChatGPT responds that as it is an objective, impartial programming language, it cannot be biased toward any opinions. AI claims that it chooses its resources based on 'credible' and 'unbiased' training data. In response to our request for references, it gave us five. To be precise, the sources it mostly drew from were the most widely read pieces authored predominantly by men. One writer out of nine was a woman who was solely engaged in art, not business or science. This shows that AI isn't creating prejudices; instead, it just reinforces those that people already have (Norori et al., 2021). Research has also shown that ChatGPT, in particular, portrays itself as the ultimate authority on science without having a solid base of facts or enough credentials (Cooper, 2023). This goes counter to the idea that artificial intelligence is unconcerned with any ideas. This, in our opinion, is the most urgent problem with the diversity of data offered by generative AI, particularly ChatGPT. We think that encouraging prejudices would only result in a less diverse society than what we already have. As humans, we make a lot of effort to create equal possibilities for everyone, particularly for minorities. AI might fundamentally undermine everything we have built into contemporary society to ensure equality, which could be extremely dangerous. On the other hand, there is also research that demonstrates how individuals apply their prejudices and stereotypes to robots, more so when they view them as Asian or Black than when they do as White (Strait et al., 2018). This shows that concerns with diversity in relation to generative AI and social interactions may be more complicated than initially anticipated. Here we discuss the possible implications of the diversity issue regarding sense of agency and social identity in educational contexts.

The vast majority of generative AI systems rely on the most widely shared and quoted information on the internet, which feeds preexisting biases and stereotypes (Chauhan & Kshetri, 2022). This may contribute to the societal polarization of ideas (Esteban & Schneider, 2008). As was already said, men have primarily authored the most quoted and widely disseminated material on the internet. As a result, it may exacerbate gender disparities, especially for underrepresented gender groups. Studies have already revealed a gender gap in technology usage (Ahmad et al., 2018), and a gender gap in technology majors in higher education (Zhang et al., 2021). This indicates that men are mostly the users and creators of generative AI systems (Leavy, 2018). Besides gender, research shows that racial and ethnic biases in resources used by generative AI systems might lead to bigger societal

problems in various contexts. For instance, a study in the USA found that healthcare datasets used for generative AI are predominantly from the US and China (Celi et al., 2022). In terms of education, it may also have the effect of making underrepresented groups feel excluded or alone, which lowers their sense of belonging at school. Since social identification and academic performance are strongly correlated, as we have already discussed, generative AI with biases may cause minority groups to disengage or isolate themselves from educational settings.

Besides the risk of decreased diversity of data used in AI algorithms and its consequences, research has also shown that social status and group membership, which are closely tied to social identity, influence one's sense of agency. According to a study, people are more likely to feel a high level of agency when they have more options due to easy access to various action options. (Barlas & Obhi, 2013). Similarly, social status is strongly related to the sense of agency. When a member of the upper class feels like they have some measure of control over their lives, and to some extent the lives of others, they also feel more entitled to take action (Louvet et al., 2018). There are more studies indicating the perceived sense of agency might differ across various groups such as religious groups (Liu & Froese, 2020), groups with different education levels and gender (Meyers, 2002; Schoon & Cook, 2021), socioeconomic statuses (Eom, Kim, & Sherman, 2018), different age groups (Nobusako et.al., 2020; Schoon & Cook, 2021). Drawing on the sense of agency and social identity research, we can confidently say that there is a strong association between social status and one’s feeling of controlling their actions, and hence their environment. Since research shows that the different levels of agency might lead to differences in using and interacting with an AI, this might also negatively affect the diversity of users. Therefore, it is crucial to use a diverse perspective to understand human-AI interactions. Specifically, when we need all groups to contribute to, benefit from, and accept AI systems, creating diversity seems to be a big challenge to deal with.

Another diversity concern regarding social identity and a sense of agency is how oppression might affect the diversity of generative AI users. AI appears to show that certain countries are ruled by dictatorships and corrupt administrations. Frequently, these governments portray themselves as trustworthy, impartial institutions. We cannot claim that the information used by chatGPT, which comes from these governmental bodies, is neither reliable nor objective. Since we are aware that the media is also tainted by this oppression, this is not the fault of AI. The fact that ChatGPT is claiming that it is impartial and objective, however, is a significant issue because it will simply exacerbate the issue. According to data showing that when people perceive AI to be more equitable, responsible, and transparent, they are more willing to use the technology (Shin, 2020). This could simply cause a difference in using generative AI systems, particularly for those who live in

oppressive countries. The diversity of users may reduce overall if AI uses information from corrupted political institutions, especially those who reside in depraved systems due to a diminished sense of agency. This is important for cross-cultural research and has some implications for any oppressed organizations, like a company or a school.

There is no denying that AI will greatly improve our society. We also cannot ignore the fact that some people are hesitant to use AI and have certain worries about it. In this review, we examined how the sense of agency in human-generative AI interaction may exacerbate issues with diversity and accountability in the context of social identity theory. According to us, intergroup relations are a concern in human-AI interaction. It is crucial to consider people's concerns from the psychology of intergroup connections. In conclusion, we attempt to explore the aspects of human-AI interactions that have been overlooked or are not related to one another. We explicitly questioned the potential importance of social identity and a sense of agency in generative AI system integration in educational settings.

5. FUTURE DIRECTIONS

Numerous psychological research has shed important light on the interactions between humans and generative AI. However, a cognitive or computer science perspective was used in most studies. The research may not have included contextual concepts in intergroup connections because of this. Our recommendation in this case might be to ask researchers to do an empirical study of the social context in interactions between humans and AI. Cross-cultural research on AI is more crucial than ever because each group uses AI for a different set of reasons. Therefore, studies should look at contextual elements to better understand how different groups of people perceive AI. The loss of agency to artificial intelligence needs to be carefully examined from an interdisciplinary standpoint.

In our review, we discussed the concerns regarding sense of agency, accountability, and diversity from a social identity perspective. Research must focus on the accountability problem as a result of losing the sense of agency to AI, on those who are more willing to lose their agency, on to what extent and in which contexts people are more willing to give their sense of agency to AI. Additionally, there should be empirical studies focusing on how to increase the diversity of the users, and how the sense of agency might affect the diversity in human-AI interactions. Research examining the leveraging inclusion and diversity of generative AI use in education indicates that by focusing on the specific psychological needs of boys and girls in terms of learning, students are more willing to use and engage with GAI in their assignments (Xia et al., 2022). Therefore, in order to improve agency in the use of generative AI systems in numerous contexts, including education, it is crucial to look at the particular psychological and sociocultural demands of distinct groups. Also, increasing the diversity of design teams and taking into consideration gender

and sex in AI could contribute to mitigating the risks regarding diversity (Fosch-Villaronga & Poulsen, 2022). As we discussed, how people perceive generative AI systems affects their motivation to use them or collaborate in teamwork. Although students generally have a favourable opinion of generative artificial intelligence (GAI), research looking at their attitudes towards it indicated that they are mostly concerned about the data's quality, privacy, and ethical difficulties (Chan & Hu, 2023). These specific issues should be addressed by researchers, educators, and developers in order to use generative AI systems in education successfully and securely. In another attempt to increase the diversity of AI users, researchers designed and delivered AI literacy courses for students coming from diverse backgrounds (Kong et al., 2021). They found that after a 7-hour course on how to effectively use AI in their studies, participants significantly improved their comprehension of AI principles and felt more confident using AI. As a result, it might encourage the usage of generative AI by various social groups and increase user inclusion, equality, and diversity.

With the advancement of AI at an unpredictable speed, we face one of the biggest questions of the modern time. Humankind has experienced this with every scientific and technological innovation. After the innovation arrives, there is a surge of negative reactions towards any novelty, which creates uncertainty for people. Subsequently, the experts try to deal with the challenges raised by the innovation. Only then we can benefit from the advancement to the fullest. As generative AI has many levels for humans to consider, the concerns should be meticulously dealt with even before the negative consequences of AI are spread out. Finally, the issue must be viewed ethically as well as in terms of technological development.

Ethical Declaration

In this study, all the rules stated in the “Higher Education Institutions Scientific Research and Publication Ethics Directive (Türkiye)” were followed.

Ethics Committee Approval

The authors declares that the research is one of the studies that does not require ethical committee approval.

Conflict of Interest and Funding

No conflict of interest and funding has been declared by the authors.

Authorship Contribution Statement

All stages of the study were designed and prepared by the authors.

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