

ADDRESSING BELIEFS IN THE IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN VISUAL COMMUNICATION DESIGN: THEORY OF PLANNED BEHAVIOUR PERSPECTIVES

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Abstract. The current situation of social development demands digitalization in all aspects of public life. The use of technology in education has some potential for improving cognitive abilities that emerge as essential benefits in the form of emotional and social perspectives. In this regard, as a foundation of cultural and learning process, education may serve as a starting point for the competent and aware deployment of Artificial Intelligence (AI). The descriptive qualitative study used to explore lecturers' beliefs in the use of artificial intelligence for higher education especially in Visual Communication Design educational context. The data was collected through a semi structured interview with seven Visual Communication Design lecturers from state University in Surakarta. The result showed that the lecturers had positive beliefs towards the use of Artificial Intelligence in Education. According to the findings, the lecturers found that there were possibilities to have both advantages and disadvantages in the process. In doing so, the participants believed that AI was eligible to support cognitive skills although several factors can facilitate and hinder the implementation of the use of Ai in education.

Keywords: Artificial intelligence, digital, education, technology, visual communication design

Introduction

The rapid development of digital-technology influences most educational perspectives around the globe. In this matter, the use of technology provides new opportunities to improve the educational process. Specifically, the comprehensive educational project implemented in Indonesia is supported by the Independent Campus, Freedom to Learn (MBKM) Curriculum proposed by the Ministry of Education (Utami et al. 2022). Accordingly, the current education encourages a combination of online distance learning and face-to-face learning which takes immense aspects of digital-aided procedure. This educational procedure supports the development of 21st-Century skills in the form of learning and innovations skills (creativity, innovation, critical thinking and problem solving, communication and collaboration); information, media, and technological skills (information literacy, media literacy, and technology literacy); career skills (flexibility, adaptability, teamwork, leadership and cross cultural skills) (Yükseltürk, İlhan, and Altioğ 2022).

Artificial Intelligence (AI) defined as new technologies (Barakina et al. 2021) which are widely used in educational context. According to UNESCO, AI served a potential to give a solution towards the biggest challenges in education, develop innovative teaching and learning practices, and accelerating progress towards Sustainable Development Goals or SDGs (Barakina et al.

2021). In the broader sense of using AI in educational context, higher educations are expected to adapt the digital-aided program while also embedding 21st century skills in the main educational purposes. Accordingly, educational institutions are the most affected domains by the development of AI in the world (Gocen and Aydemir 2020). Furthermore, the new forms of technology may dominate in human society which effects educational sectors to have choice but make a room for the implementation (Karsenti 2019). The use of AI is useful to assist developments in education sector. Particularly, the use of AI has been adopted and pervaded in various domains of the educational sector, or departments in a wide range of educational institutions. In this matter, the use of AI in education influences several aspects such improving efficiency and effectivity of global learning and administration (Chen, Chen, and Lin 2020). As a matter of fact, when the AI continues to evolve, new educational platform continues to emerge.

In particular, several studies indicate various researches on artificial intelligence in different areas such as English education (Xu and Margeviča-Grinberga 2021), Mathematics education (Heins 2022), and discourse related to education and school context (Gocen and Aydemir 2020). In this matter, the higher education students tend to be more exposed to the newest platform and media of technology in their daily life especially for Visual Communication Design students. The students have the tendency to use various kind of platforms to assist on editing, creating, designing and developing concept. In doing so, AI in educational perspectives become program assistance for teaching, learning, and decision-making (Hwang et al. 2020). Nevertheless, the tremendous innovations of technology is believed lead to an abundance of risks and challenges (Barakina et al. 2021) in achieving educational purposes. In doing so, lecturers were required to gain the understanding, knowledge, skills, and awareness about Artificial Intelligence in different media usage and platforms.

The notion of belief has been defined interchangeably with a variety of concepts, such as perceptions, perspectives, and opinion. In this matter, belief is a simple proposition which is consciously and unconsciously accepted to be true, thus reflecting on people's actions (Borg, 2001). Meanwhile, belief is also perceived as a perspective or viewpoint that someone held about a particular concept (Khader, 2012). Furthermore, Gilakjani & Sabouri (2017) defined belief as individual judgement about specific ideas. In this matter, beliefs can be perceived as a proposition which is associated with people's mental construct that influence people behaviour and actions. This belief system may influence how people perceive the world and how people personally deal with particular domains. In a digital world, this belief reflects the development of people's 21st century skills to be more adaptive to new technology and information-oriented.

The theory of planned behaviour is a proposition to explore the notion of beliefs by determining individual intentions' namely: behavioural beliefs, normative beliefs, and control beliefs (Ajzen, 1991). In this matter, the theory of planned behaviour is used to predict the occurrence of particular behaviour under the control of particular factors (Laksani 2019). Associated with the personal evaluation about specific concepts, individuals have various perceptions about positive and negative attitudes which may affect certain outcomes.

In this matter, the concept of the theory of planned behaviour proposed by Ajzen (1991) is divided into three areas, namely behavioural beliefs, normative beliefs, and control beliefs.

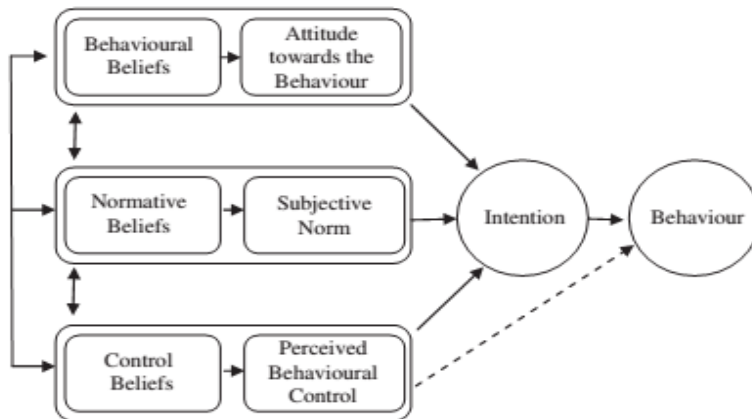


Fig.1. The Theory of Planned Behavior

Behavioural beliefs are types of beliefs that are associated with attitudes towards particular concepts. In this matter, behavioural beliefs focused on the perception about the relationship between performance of a particular attitude with certain outcomes. Meanwhile, normative beliefs relate to the concept of subjective norms. This notion focused on the individual beliefs that expectation from a person or institution is important to perform a given behaviour. For instance, the belief that digital usage is important or unimportant is a concept of subjective norms. Meanwhile, the perceived behavioural control focuses on the consideration whether particular attitudes may be easy or difficult to perform. This concept associates with the motivational factors and enthusiasm on performing particular behaviour (Koc and Memduhoglu 2020).

Artificial Intelligence is a concept that associates with the concept of smart machines. For the use of the word intelligence to define a particular object, there are several definitions proposed by experts. First, artificial intelligence (AI) is a technique that generates human intelligence using computers, particularly computer systems (Heins 2022). In line, AI is also believed to be computers with cognitive functions which are associated with human brains (Baker, Smith, and Anissa 2019; Wang 2019). Meanwhile, McCarthy (1955) described AI as the process of making machines that have a particular function that would be considered intelligent if a person were doing so (Cope, Kalantzis, and Searsmith 2021). In this case, artificial intelligence is perceived as a tool that produces human-like functions.

Moreover, AI is defined as the combination of computer-related technologies, machines, and communication technology giving the ability to handle human-like functions (Chen, Chen, and Lin 2020). In particular, AI is a notion that represent a technology that can perform and execute human cognitive skills, namely speaking, thinking, learning, and solving problems (Jantakun, Jantakun, and Jantakoon 2021). In this matter, AI is used in a wide range of domains, such as voice recognition, language and writing processing, design and illustration programs, animations apps, and control systems in tools and robots.

In educational context, AI-aided education pervades smart education, innovative virtual learning, prediction and data analysis in order to improve learning values and efficiency (Chen, Chen, and Lin 2020). Accordingly, this concepts may affect the development of independent learning abilities for higher educational purposes. The students may access various learning materials, platforms, resources which significantly swift the students learning behaviours. Particularly, the use of various platforms and applications in visual design areas has also facilitated the development and deployment of pedagogical tools. The use of AI as an instructional tool includes the use of simulation-based instructions in order to demonstrate

particular practical materials (Chen, Chen, and Lin 2020) thus affecting the students' learning experience (Rus et al. 2013).

Specifically, artificial intelligence is also generally defined as the machine's ability to think, to perceive, and to act as humans. In short, AI represented the ability of the technology systems to imitate human mind and actions (Gocen and Aydemir 2020). Furthermore, AI is perceived as machines to process data, patterns, models, make predictions, and also manipulate objects (Karsenti 2019) where designers tend to exert this kind of platform. In the visual design context, AI is used for a wide range of purposes. Karsenti (2019) proposed the concept of deep learning which focused on the use of AI in recognizing an image and making an illustration of a particular object. The notion of AI in design which can acknowledge certain shapes and typical features of objects into a digital design.

As a matter of fact, it is inevitable that this growth has a significant impact in higher education sectors. Several studies had conducted research results of the possibilities and effectiveness of the use of technologies in educational context (Barakina et al. 2021). In this case, the research focused on the lecturers' beliefs in using AI in visual communication design educational context. Moreover, this research examined the positive and negative aspects of using AI. In this regard, this research seeks to explore the beliefs of the lecturers of visual communication design about AI, how the lecturers perceive the development of AI in higher education, and how this belief actually has affected their ideas about teaching and learning process. Furthermore, it is anticipated that this research will ascertain personal belief of the lecturers in AI and what implications for the future behaviour of education according to the opinions from visual design sectors.

Methods

A research methodology described as a particular process in order to identify, select, process, and analyse information about a particular topic (Heins 2022). Particularly, this research used qualitative study to explore beliefs about the implementation of Artificial Intelligence in higher education. Using the theory of planned behaviour, this research focused on exploring the beliefs system that the visual communication design lecturers have about AI. This research also focused on factors that facilitate or hinder the potentials on implementing AI in education. For this purpose, descriptive study approach was applied. The process were begun with data collection, data analyses, and data description. The data were collected by using semi-structured interview. Then the raw data were analysed to retrieve the data. Then the raw data were analysed to retrieve the suitable and appropriate data.

The participants of the research are Visual Communication Design lecturers at one of the state universities in Surakarta, Indonesia. One common characteristic of the participants was that they belong to gen-Z lecturers. Therefore, purposeful sampling procedures were used to select the participants. The use of selected participants may lead to better understanding of the research problems and preserve the process effectively and suitably with the research goals (Creswell, 2016). Having a particular attention to visual communication design educational programs, the research focused on seven participants to be interviewed about the use of AI in educational practices. The first semi-structured interview was conducted by spreading the google form in March to understand basic beliefs that the lecturers hold about Ai in education activities. Furthermore, in order to get a better understanding about the issue, a face-to-face interview was conducted which indicated the interest and concept about AI in the design project.

Focusing on the data analysis, the content analysis (Corbin & Strauss 1990) was used to organise and interpret the data. The data obtained in this research was accurately read, coded, and analysed according to particular categories. In order to ensure coding reliability, the data were analysed more than once.

The data from the interview were transcribed. Focused on the interpretative nature of the study, the research used open and selective coding to analyse the data. The open coding includes the coding process by fracturing the transcribed data sentence-by-sentence. For example, different responses from interviewees were sorted and categorised in one raw data. After the similar and different information were identified, the concepts were grouped and labelled to make appropriate categories that were related to the theoretical concept, in this matter focusing on the concept of beliefs based on theory of planned behaviour. After the categories were identified and the concepts extensively defined, the categories became the basis for in-depth exploration.

Result and Discussion

Focusing on the exploration of the beliefs by utilising the theory of planned behaviour about the AI in visual design context, this research focused on three notions, namely: behavioural, normative and control beliefs.

Behavioural Beliefs

The behavioural beliefs describe the perceived attitudes which lead to desirable results. The findings showed particular beliefs held by visual design lecturers about the use of AI in education. In this matter, the lecturers mostly believe about the benefits of AI in education, namely: developing students' 21st Century skills, managing effective learning, and increasing students' awareness of the digital future in visual design context. The results of the semi-structured interview showed that most of the lecturers believe that AI is useful to be used in the classroom especially for today's generation. One of the participants proposed the concept of developing 21st Century skills as follow:

"The development of Artificial Intelligence is massive. This also affects the classroom instruction and objective. We used to focus only on the idea of having a great score, understanding a particular subject. But now we have a different objective that relates to 21st Century skills. Especially visual design students that tend to face many platforms to search, to design, and to create particular objects. It's really helpful for them".

Another participants also stated the same idea as explained below:

"In my classroom, the use of AI in the form of various platforms, simulation tasks, and many more things are crucial. Indeed, with a lot of sources on the internet, it will help them to develop critical thinking and communication skills. The students look more interested in doing particular tasks nowadays".

Instead of avoiding the negative sides of AI, the students need to be more aware about the benefits of AI in the future. One of the participants explained:

"In the digital era where AI is growing fast, we can hinder our students from using the same procedure as we used to be. Instead, it's a great time to introduce the students to particular AI so that they can get benefits from it".



In another context, AI-based applications are also used to detect plagiarism in students' papers. The use of Turnitin before submitted to the lecturer became one of the requirements in several subjects in the visual design class.

“The use of turnitin as an application to support writing assessment that can detect potential plagiarised information, the potential data resources, and the percentages of the similar data appears in the article”.

Furthermore, the algorithm in AI made an appropriate influx to the students' educational background. AI made individual learners match to their education needs, learning styles, and content characteristics.

“AI can make students be aware of their own pace of learning. This has actually happened because AI makes a particular algorithm which matches the students' interests. Thus, AI makes the students' gadgets to be more personal and in education, it may enrich their particular course or study”.

Taken from the data, it was revealed that developing students' awareness about digital platforms and applications was one of the crucial reasons for using AI in the classroom. The participants believed that in the current situations when the availability of sources and platforms are easy to retrieve, it has to be balanced with the ability of the students to use wisely. One of the participant argued:

“Nowadays, students really get the benefits of finding sources, creating concepts, and designing objects by means of platforms and applications available. For instance, when the students had a task for writing a paper, they tend to use several applications and use websites for helping them. Instead of forbidding them to do so, I will ask them to check the plagiarism too. So, even though it is easy to get the data, they actually had the responsibility to keep honest and aware about the world”.

Furthermore, it is believed that AI can foster students' teamwork, improve classroom behaviour, increase students' engagement and motivation, and also create easier and effective teaching management. Particularly, the perceived attitude of using AI in education has associated with the demands of the future world. In this case, all of the participants believed that using AI in education may help the students to have a better preparation in the future world career. In visual design context especially, the platform will always be different from the current situation. They remarked that the understanding of AI help them to survive in the modern society in the next future.

Normative Beliefs

Normative beliefs associate with the subjective norms which focused on the approve and disapprove of particular attitudes between society. Taken from a semi-structured interview revealed that the use of AI is actually influenced by the intentions of fulfilling others expectations from institutions and students. First it focused on the expectation from the institutions. Most of the participants agreed that institutions played a crucial role in the decision to use AI as classroom instruction. One of the participants stated that:

“The institution is highly supporting the newest technology integration in the classroom. We, as a lecture, usually share and discuss the newest program or platform in visual design. Indeed, we have a chance to develop our skills through webinars or workshops that the institution fully supports”.

In this matter, it can be concluded that one of the basic reasons to use AI in the classroom was the institution requirement to always in line with the newest learning experience that

supported the development of digital literacy and competence of the students. Moreover, the intentions to integrate digital literacy in the classroom was also motivated by the expectation from the students. Taken from the interview, the participants believed that the use of AI in education, especially in visual design context, was relevant to students' interest. One of the participant stated:

“The students are digital natives. They tend to get a higher exposure to technology and information. Of course, they expected to have modern and newest learning experience using digital media. In this case, they tend to be more interested in the learning process”.

Control Beliefs

Control beliefs relate to the internal and external factors that may facilitate or hinder the performance of particular behaviour. Based on the data from the interview, it was found that the belief to use AI in education was highly influenced by several factors such as technology availability and sufficient knowledge from the lecture to perform particular concepts. The participants argued that AI has already been common to be used in educational context. One of the lecturers said that the teaching and learning instruction tends to use smart phones and web browsers on learning basis instruction. Taking into account the technology availability, the participants stated that based on their experiences to deliver materials using AI along the way was really helpful. However, they will use the most appropriate platform with the suitable computers available. The participant said:

“... based on my past experience, I will use a platform that the available computer can actually work with. It's quite difficult to manage all the computers to always update to the newest program. So, I will use the digital tools available, then ask the students to look for more information on the internet”.

In line, other participants stated that it is challenging to introduce several programs for visual design students. However, it is manageable to have a meaningful learning experience using the available tools in the laboratory because the students may have different and broader experiences in the process.

Moreover, the data also revealed the internal factors that influence beliefs system was the sufficient knowledge of the lecturers to the newest platform. A participant said that knowledge and experience become the major factors when dealing with practical learning.

“As a lecture, we need to be more aware of the newest digital platforms. In this case, we need to have sufficient knowledge and experience to do so because in the process of delivering materials, somehow we may find errors and many more things happening. This is a big challenge for us. We need to try it first before delivering the concept to the students”.

Likewise, in order to have sufficient knowledge about the newest concept of available AI, the participants believed that it was crucial to get regular professional development on specific technology and digital-aids education.

“I gradually joined seminars and conferences related to AI and technology for education. It helps me to keep up with the newest platform and concept that can be integrated in teaching and learning activities. Specifically, in the visual design context where the AI program has been growing rapidly. We, as a lecturer, need to be more aware of this change”.

Artificial intelligence has significant potential by combining virtual and everyday realities in the concept of human relations (Barakina et al. 2021). The results revealed that the participants' ideas on the enablers and barriers of using AI in education are mostly focused on



the enablers. For instance, the participants proposed the idea to assist students' awareness on AI because they thought the students would be exposed to various types of platforms that provide a chance to develop and improve their skills and ability. Nevertheless, the participants also stated the barriers may arise in the form of the management issues when they found that most of the students tend to use AI rather than use their own personal ideas.

In implementing AI in educational practice, especially in visual communication design perspectives, several skills that can be affected were divided into two major categories, such as: cognitive and social emotional domains. The findings revealed that AI can promote a wide range of cognitive skills. In educational context, the use of AI assists the students to find related answers faster and easier (Heins 2022). In this matter, all the intended information can be easily accessed and retrieved. The findings also showed that Ai was helpful in enhancing students' critical thinking, which is similar to deconstructing problems and solving problems (Yükseltürk, İlhan, and Altıok 2022). Moreover, the use of AI also can improve students' analysing ability in the form of strategy, organising objects, differentiating images, and distinguishing concepts.

Beside the development of cognitive skills, the use of Ai for designers also influences social and emotional skills. In this case, the participants commonly define the ability to have co-operation and sociability, also the persistence, achievement, motivation, and self-efficacy. As a means of assisting people, AI affects creativity as a least cited social skill. Specifically in the visual design context, AI has been extensively adopted and used in the educational sector. The lecturers believed that the use of AI in the form of practical simulation materials as well as the learning resources can help the students to develop and retrieve more ideas.

Conclusion

Based on the result of the research, it can be concluded that there is a positive relation between the belief systems and the attitude someone tends to perform. Providing a comprehensive description about beliefs by utilising theory of planned behaviour, the research showed how the lecturers perceived AI in visual design context and what factors that facilitate and hinder the attitude. This means that, the more positive someone's perception towards AI, the more possible AI will be used in an educational context. In this research, it revealed how positive all the participants toward AI in visual design educational context. Moreover, the expectation from others such as institutions and students also influence the beliefs to integrate AI in the learning practices. Meanwhile, internal and external factors also become the significant issue that facilitate the integration of AI in education. The digital technology available and sufficient knowledge to perform AI were the most significant factors that most of the participants argued. Further researchers are expected to be able to have deeper information about how AI is implemented as learning instruction.

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