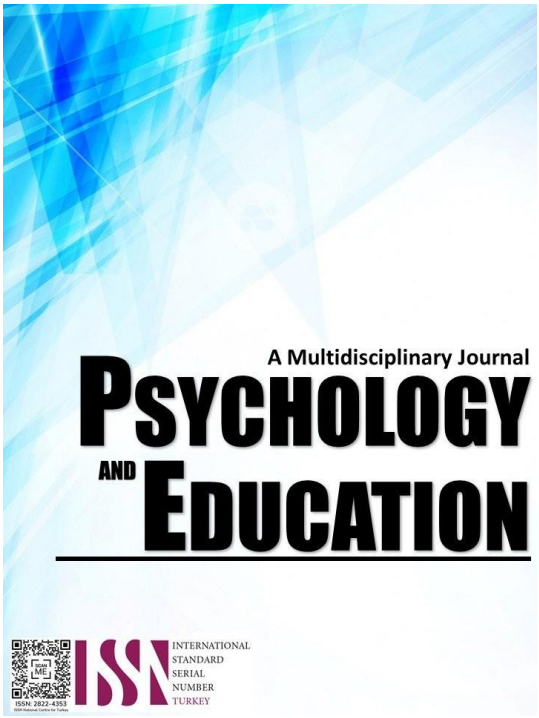
AI IN THE WORKPLACE: 4IR AND DEGREES OF SENTIMENTS TOWARDS AI IN THE ACADEME INDUSTRY



PSYCHOLOGY AND EDUCATION: A MULTIDISCIPLINARY JOURNAL

Volume: 16
Issue 10
Pages: 1143-1152
Document ID: 2024PEMJ1532
DOI: 10.5281/zenodo.10635748
Manuscript Accepted: 01-16-2024

Psych Educ, 2024, **16**(10): 1142-1152, Document ID:2024PEMJ1532, doi:10.5281/zenodo.10635748, ISSN 2822-4353

Research Article

AI in the workplace: 4IR and Degrees of sentiments towards AI in the Academe Industry

Francisco L Sanchez Jr.*
For affiliations and correspondence, see the last page.

Abstract

Digital transformation was imminent during the pandemic years which started in 2020, the Fourth industrial revolution was evident during the said years because restrictions to mobility to curb the transmission of COVID-19 necessitated digital transformations in the economic and political spheres. However, economic, and political aspects were not the only institutions affected by the pandemic but also the educational institutions. In this paper, the researcher explores the development of the fourth industrial revolution by peering through the AI-enabled tools and technologies and its effect towards the academe industry. Using mixed method analysis, the researcher will use archival case-study design in gathering studies about sentiments and attitudes of AI in workplace in the global, regional, and national setting using thematical analysis the researcher will explore recurring themes about AI in workplace, this will then be studies at parallel with descriptive quantitative method using a four-point Likert scale focused in the academe industry, inquiring perceptions of benefits, risks, opinions about effectivity of AI, and beliefs and opinions on how AI will affect the participants' job, profession, and institution in the future. The purpose of the study is to explore the degree of sentiments of academe practitioners in their workplace by peering through their perception towards AI use especially in the academic setting whether there has been an AI boom in the academe industry is determined in this study as perception, opinion, and cues of action towards AI use. The study shall then explore these facets in order to recommend and suggest to academe industry and institutions the need to practice and train for ethical AI-enabled tools and technologies application and use in the academic work settings. Globally, according to the study conducted by Beauchene (2013), Rao (2023), and the Boston Consulting Group (2018) which focused on diverse industries and not specifically in the academe, 60% of their global participant are curious about AI in the workplace, while 40% are concerned about AI proliferation in the workplace, and 35% are optimistic about AI in workplace (Beauchene et al., 2013:, Rao, 2023:, BCG, 2018). This study matters because first, the study is specific within the academe industry alone unlike the global survey which focused on diverse industries, and second, the proliferation of AI-enabled tools and technologies can be observed not just globally but also within the academe industry in the Philippines, with 36% of the participants are curious about it, while optimism and concern is observed with the 32% of the participants of the study, and on the level of use if AI in the workplace, 65% of the participants (n=20) said that some form of AI-enabled tool or technology is already in use within their workplace.The use of AI and AI-enabled tools and technologies will continue to increase in the foreseeable future, such that the study not only yielded the number of practitioners using AI-enabled tools and technologies and their degree of sentiment with AI-use, but also the study found out that new learning strategies rose out from this phenomenon such as personalized learning and adaptive learning. The study's objective is to explore the sentiment of AI-use within the academe industry as the effect of the 4th industrial revolution and that trainings, regulations, and pathways to responsible use of AI is needed in future-proofing the academe industry in the proliferation of AI as it is here to stay.

Keywords: *education, AI, fourth industrial revolution, academe*

Introduction

The pandemic years which started in 2020 saw the rise of an innovation cycle that either forced or necessitated a change in how humans operate both in social and economic spheres due to social mobility constraints to suppress the spread of Covid-19, it saw the entry of the Fourth (4th) industrial revolution known as industry 4.0 (Neufeld, 2021; Chourasia et al., 2022; Duggal et al., 2021) which heralded the entry of digitalization of economies both micro and macro-scales, remote arrangements both in work and life, as well as developments of tech-companies on making the datasphere more robust through enhanced machine learning and artificial intelligence. However, the 4th industrial revolution did not just dominate the realms of economy and information systems, but also the education sector. It is evident that due to limitations in resources and mobility, the pandemic years necessitated a change in how education is being delivered by teachers and students.

According to the statistics by the Department of Education, around 250, 539 students have transferred from private to public schools and an additional 380, 000 students made the choice to transfer from private to public, citing economic challenges that prompted this exodus (Palis, 2022). This mobility from private to public due to economic and financial concerns also means that there were limitations

on technological and infrastructural capacity as public schools cannot provide the same level of support as the private schools do. As such, the Philippines' Department of Education solution was a blend of remote-learning options, tapping mainstream media networks in television and radio to air shows from the Department of Education's programs that cater English, Math, and Sciences subjects.

The digitalization of the education sector of the Philippines not only addressed the challenges of the pandemic years, but also opened doors on use of educational technologies like a boom in the use of Zoom – a video conferencing application, and Canva – a multimedia design tool that is easy and convenient to use. However, it also paved unconventional technologies that aided the students and teachers alike in learning and teaching – enter, Artificial Intelligence-enabled tools and technologies like ChatGPT and Google Bard.

In this paper, the researcher would like to explore on the sentiment of industry sectors notably the academe industry in the use of AI-enabled tools and technologies. With the proliferation of AI in workspaces, how does the academe sector navigate and bridge a gap of another technological advancement prompted by the opening of industry 4.0 with education?

The pandemic years have expedited the transition of education from traditional set-up of face-to-face to a more digitalized one, because of this rapid digital transformation there was a boom of innovation on how education is being delivered to the students, as well as how information, assessment, and evaluation of academe practitioners are being applied to and exercised to the students. This interest in studying the impact of the fourth industrial revolution that was sped-up by the pandemic prompted the researcher to explore and examine the sentiments of the academe industry practitioners on how they perceive about AI-enabled tools and technologies used by them and used by their students and their belief, cues of action, and opinion on how AI-enabled tools and technology might affect their profession and their industry.

The qualitative nature of this paper will peer through ai-sentiments using literatures and studies both global and local levels in understanding sentiments of industries and notably the academe industry towards AI-enabled tools and technologies, paired with the theoretical framework of reasoned action/planned behavior, the research questions will thread through inquiries like perception, belief, and behavior towards AI-enabled tools and technology and discover the dominant sentiment of the academic industry in the use and ethics of AI-enabled tools and technology in the education workspace. This qualitative design will be paired with quantitative analysis to cross-examine whether same sentiments globally is seen in a more specific local level and explore the best practices of industries in future-proofing their profession and industry in the proliferation of AI-enabled tools and technologies in the age of fourth industrial revolution.

Research Questions

The rise of AI and AI-enabled technologies have divided communities on their perceptions and beliefs about the current innovation cycle, spurring notions that some industries and employments would be lost due to machine learning and artificial intelligence replacement, this perception and belief towards machine learning and AI have been somewhat vague in the academe industry, with some welcoming this innovation while others sees this as regressive than progressive.

However, despite the dawn of AI and the rise of AI-enabled technologies, the belief and perception of individuals on how AI will aid the industry remains in a state of varying degrees of acceptance, and the ethos on use of AI especially in the academe industry remains to be seen in fuller picture. The researcher shall explore the varying degrees of acceptance of AI and AI-enabled technology in the academe industry, inquiring about the following research questions:

1. What is the extent and distribution of AI and AI-enabled technology adoption among both non-academic and academic professionals in the academic-industry workforce?
2. What are the attitudes and sentiments of academe-industry workers towards AI and AI-enabled technology in their respective workplaces?
3. Does frequent use of AI and AI-enabled technology induce revolution or evolution of the workplace?
4. How do academe institutions incorporate ethics into the use of AI and AI-enabled technologies in learning?

The corollary research questions above will serve as the guide of the researcher to answer the study's central argument on exploring AI sentiment, acceptance, and action within the academic setting, furthermore, the corollary research questions also follows the framework of the theory of reason action and planned behavior in which the questions are thematically framed based on the theory to be used, starting with exploring perceptions and beliefs, followed by attitude towards these behaviors, behavioral control, and subjective norms, and lastly the behavioral outcomes.

Literature Review

The Fourth Industrial Revolution

Several industrial revolutions have had happened during humankind's historical timeline. The first industrial revolution happened in Europe, where there was extensive use of steam-powered machines, this welcomed an era of steam locomotives, mass production, and efficiency in production lines, the second industrial revolution was brought about using electricity, here electricity-powered machineries further improved industrial efficiency and of course the lives of people. The third industrial evolution is kickstarted by computers and the birth of the internet; through networks and connectivity, it brought people more closer and information more accessible in our fingertips (Duggal et. al., 2021).

The fourth industrial revolution or Industry 4.0 is defined as the integration and interconnectedness of intelligent digital technologies in the sectors of industry and manufacturing. According to Burrus (n.d.), the general definition of industry 4.0 or 4IR is the rise of the new and emerging digital industrial technology, a transformation that allows humanity to work alongside machines in new and highly productive means. The fourth industrial revolution began in the early 21st century wherein it is predicted and studied that the 4IR will be the dawn of information technology and the broad use of artificial intelligence (Duggal, 2021). It is believed that the influence of the third industrial revolution continued and well trickled until the early 21st century, but according to Duggal (2021), studies about 3IR became saturated, no new research has been done about computers and the internet.

In 2011, scientists working for the German government first introduced the concept of the fourth industrial revolution because of the saturation of research fields in the aspect of computing and internet, and in hopes to create and promote that computerization in manufacturing and the industry sector is revolutionary (Industrie 4.0-BMBF as cited by Duggal, 2021), but according to Lassi et. al. (2014) this trend has been around since the 1980s but has not set off in the global scale because of lack of support and skeptcism (Lassi et al., 2014). However, the notion of 4th industrial revolution reached wider audience when Karl Schwabb, the former executive chairman of the World Economic Forum made it the theme of 2016's WEF conference entitled "Mastering the fourth industrial revolution".

Since the promotion of 4IR in the wider audience notably through the World Economic Forum, axioms of what 4IR constitutes is thematized based on systematic review of studies that relates to the characteristics and traits of emerging technologies, innovations, inventions, and behavior towards these technologies. 4IR welcomed the following themes within the sphere of humanity: augmented reality or AR, automated manufacturing, internet of things or IoT, cloud computing, Big data, and lastly artificial intelligence (Duggal et al., 2021:, Lasi et al, 2014:, McKinsey & Company, 2022:, Schwabb, 2016:, SAP n.d.:, Smith, 2023:, Agrawal et. al., 2020)

The 4IR and Pandemic

It is worth noting that 2011 was the start of the emergence of the characteristics of what is soon to be termed as the "fourth industrial revolution" and that this emerging concept was evident in the 1980s but never gained traction due to lack of popularity to the global audience. It was during 2016 that the term 4IR was introduced to larger audience through an international forum – specifically World Economic Forum. Indeed, 4IR's strength lies with the integration of human – machine capabilities such as augmented reality, artificial intelligence, big data, and automation. 4IR is seen as a transition from exclusive human is separate from machine to a more huma-machine integration, thus the process of digitalization or digital transformation. These aspects are the focal points of 4IR which was evident during the pandemic years which started in 2020.

Digital transformation is not new, according to Bellamy & Taylor (1998) digital transformation has happened since the 90s disguising as Electronic Governance or E-governance, surely, during the 90s saw the integration of computers in making everything "electronic", from mail, to documents, to even transactions in banks and finance institutions which later trickled into government institutions. However, the guise of digital transformation in the means of digitalizing the traditional transactions of paper and pen developed further into accommodating user-experience to improve digital transformation, welcomed engagements with people (Bellamy & Taylor, 1998:, Agostino, 2020).

However, the pandemic years brought about the necessity to digitalize everything, this is because of the imposition of physical distancing, restrictions to travel, and limits to mobility to mitigate the transmission of Covid-19. Delivery of goods and services have shifted from on-site to online transactions during the pandemic years, and everything necessitated the use of software applications both mobile, or desktop in nature (Agostino, 2020). Because of this, the pandemic years brought about extensive use of social media platforms, it is said that social media penetration was 45% during 2019 globally and had risen to 50% on average across regions around the world (Routley, 2020), the use of social media platforms in combination with mobile applications have accelerated e-commerce

growth, according to Routley (2020) digital wallets became a gateway for consumers to enter the cashless and cashier-less transaction realm, furthermore, 78% of consumers used digital wallets during 2020, and in 2019-2020 there was an 11% increase in e-commerce through businesses shifting from online services.

The 4IR was very much evident during the pandemic as digitalization dominated the social and economic spheres, the pandemic years which started in 2020 have forced or necessitated organizations, businesses, and government institutions to shift from the traditional way of transaction which is on-site – to online transactions using digital tools and technologies both old, new, and developing. The 4IR also strengthened user-experience, co-creation, and engagement aspects of digital transformation by catering to the needs of the people in time of mobility restrictions and limitations to physical transaction.

Methodology

Research Design

The researcher shall use qualitative and quantitative (mixed method) research design in exploring AI sentiments in the academe industry in the Philippines. In the qualitative design of the paper, the researcher shall use archival case study to gather insights on different educational institutions starting with the global level down to the local level on the aspect of AI-enabled tools and technologies in the industry in general and in the academe.

In the quantitative side of the research, the researcher shall employ descriptive quantitative design to inquire on the sentiment and use of AI-enabled tools and technology in their workplace and peer through opinions and beliefs about AI-enabled tools and technology, using a digital survey form, the researcher shall conduct a small-scale survey to assess the sentiments of Filipino educators coming from varying teaching levels about AI-enabled tools and technology use in their workplace.

The researcher employs mixed method of research design because of how it is appropriate in comprehensively cross-examining both the trend and issues about AI-enabled tools and technology in the global, regional, and local levels using related literatures, and studies on AI-use in different industries while looking at the numbers on the AI-use in a more specific industry which is the academe; the archival case study in the qualitative phase shall be used to gather insights on the adoption of AI-enabled tools and technologies in educational institutions at both global and local levels. In the quantitative phase, surveys will be administered to a representative sample of academic-industry workers to collect data on their frequency of AI usage, attitudes towards AI, and its impact on their workplaces. The results from both phases will be integrated and analyzed to provide a comprehensive discussion and understanding of the topic which matters as the researcher argues that AI-enabled tools and technologies have proliferated within academe industry and have created new forms of teaching and learning strategies and that this characteristics of fourth industrial revolution has been expedited by the pandemic year causing varied degrees of sentiments on AI-enabled tools and technologies within the Academe industry (Beuchene et al, 2023:, Watnick and Park, 2023.; Creswell, 2017).

Participants

Purposive sampling method will be used in disseminating the digital survey as the paper requires participants from the academic industry and education sectors. Purposive sampling is a type of sampling method that requires a specific category or classification of participants based on the judgement of the researcher. It is cost and time effective because it only requires a specific population – in this case, the teachers and those working in the academe industry (Heath, 2023:, Black, 2010:, Creswell, 2017).

The population to be sampled will be academe industry workers such as teachers, trainers, professors, instructors, or lecturers who hold a teaching position or both a teaching and an administrative member of a school, college, or university. This made the sampling more purposive in nature. The population is not locale-specific, meaning that it does not require a specific place, location, region, or a specific school to be conducted for as long as the participant is an academic practitioner.

The instrument to be used is a web-based / digital survey form made through Google Forms. The survey consists of 6 sections, the first section is a consent waiver and privacy and data protection policy, the second section will inquire about demographic profiles such as age, educational attainment, and the educational level to which the individual is working in. The succeeding sections are in a four-point Likert scale that is designed to explore the perception, belief, opinion, and behavior towards AI use in the academe sector using scales of degrees of likelihood, satisfaction, frequency, and good and bad scales (Elliot, 2021).

For the statistical treatment, since the paper will be using descriptive quantitative design, the researcher shall use frequency of distribution in this paper which will peer through the percentage of the number of participants' selection of answers in relation to the

total number of participants. Conveniently, surveys made from digital applications and software such as Google Forms automatically computes the frequency of distribution and encodes these data by linking the results with Google Spreadsheet (see Appendix on access links).

Ethical Considerations

The surveying of academic practitioners did not commence without ethical considerations. As part of ethics in doing research, the researcher's survey asked for consent in the first section of the form whether they would wish to proceed with the participation or not. The Google Form to where the survey was created does not collect any form of names that is sensitive to the participant (Ex. Their name, name of school, etc.), the form did not collect addresses of any kind (ex. Residential or business), and did not collect birth dates, and specific age as part of the data privacy procedure. Furthermore, the researcher assured the participants of the study that the survey form will not collect the e-mail address they used even though Google prompted them to sign-in first before accessing, the form did not collect their email address.

Aside from data privacy and consent sections, the researcher e-mailed institutions to invite them for participation notably the Technical Education and Skills Development Authority or TESDA Philippines, and iAcademy Philippines, the researcher managed to get a reply with the said institutions saying that they are in the process of approving the said request, the institutions have not followed up since the sending of the letters last November 2023.

Furthermore, since the form was adopted from previous studies, it has been modified to cater the study through re-phrasing: removing variables not associated with the study, changing the way the questions are structured, and unified the choices to fit as a four-point Likert scale instead of varying number of choices. Most of the questions are from BCG global survey, with almost 45 items in the survey, the modified version has only 30 items in total (see Appendix).

Results and Discussion

In this section, the researcher will - at parallel - examine the attitude and sentiment and attitude of AI-use in the workplace using archival study and survey results from small-scale participants. Using archival study, the researcher will analyze thematically the content of archival data such as literatures and data sets from primary and secondary sources of information. The first two sub-sections will discuss about sentiments and attitudes towards AI-use globally in the workplace, later in more specific aspect the academic industry.

The second discussion will focus on the result of the survey which was conducted from November 20 to December 04, 2023 exploring the attitudes and sentiments of academicians and academe industry practitioners towards use of artificial intelligence in workplace.

Frequency of use and Sentiments on AI-enabled tools and technology

Industries

Defined by the World Economic Forum, Generative Artificial Intelligence of Generative AI is a category of artificial intelligence that generate outputs based on what the AI-enabled tool or technology has been trained to (WEF, 2023.; Ng et al., 2023). Furthermore, Generative AI unlike any traditional artificial intelligence is designed and trained to recognize patterns and make predictions based on these patterns through so-called neural network machine learning, the products that these generative AI may produce varies from generating images, new lines or summarized versions of texts, audio, and video creation, and so much more (WEF, 2023).

Globally, there has been a boom in the use of generative AI in industry settings and workplaces. According to Ghaffary (2023), the use of generative AI has seen its boom with the release of a newer version of ChatGPT IN November of 2022 created a hype globally as it is tested to be a form of generative AI that can create content like new lyrics, essays, and images. Several generative AI have boomed during 2022, like DALL-E which generated paintings and drawings (its name is derived from Salvador Dali), and image-generating and photo editing generative AI named Lensa (Ghaffary, 2023).

The introduction of generative AI did not just generate new platforms for individuals to use or tinker with, it also generated investments and further development of generative AI programs, notable an Open-access artificial intelligence or OpenAI. When generative AI products were introduced last 2022 it kick-started investment supports from different companies notably in the Silicon Valley (Ghaffary, 2023:. Heilweil, 2023). For example, Google made a generative AI that is seen to compete with ChatGPT named as Google Bard, and integration of AI in applications like Microsoft Edge and Zoom (a tele-video-conferencing application), furthermore, newer

versions of OpenAI are in the works to challenge and compete with existing early models of generative AI applications.

Disruptive Technology Globally

Indeed, artificial intelligence most specifically generative AI and its applications is a notable disruptive technology that has been developed in the pandemic years. Able to create and generate new ideas, content, or object, it is an innovation that significantly altered the way we as consumers and industries operate (Smith, 2022).

The pandemic years gave rise to disruptive technologies, for example, blockchains which initiated cryptocurrencies decentralized how consumers use currencies in the digital sphere, and applications that cater to the customized needs of the consumers such as TikTok which at first was a social media platform became a market of goods and services became more rampant and relevant during the pandemic. Indeed, disruptive technologies offer innovative and affordable solutions, and continuously experiment on new business models such as "Freemiums" in which certain levels of use unlocks exclusive content, and subscription commissions.

Sentiments towards AI-use

Global attitudes towards AI

Sentiments on disruptive technologies – in this case, the use of generative AI - varies according to regional, national, and economic aspects. Since generative AI can drastically make an impact on societies and industries, Ipsos conducted a study in a global scale to explore the sentiments of individuals and their attitudes towards AI across varying economies and development stages.

In the survey conducted last 2022 which took place as ChatGPT and DALL-E is being launched as the initial forms of generative AI, of the 28 entries of selected countries, China, Saudi Arabia, India, Peru, and Malaysia have an average of 72% (Seventy-two percent) of respondents agreeing that products and services using AI have more benefits than drawbacks (Boyon, 2022:, Lu, 2023). Ipsos further noted that survey returns coming from China and India have 78 and 71 percent of the respondents agreeing that AI use has more benefit in products and services because of how highly urbanized, more educated, and more affluent than the general population, thus this results to leaning towards AI use at it reflects a more tech-savvy population (ibid.)

Evidently, in the survey conducted, 87% of the respondents from China agreed that products and services using Ai-enabled tools and technologies made their life easier, with 80% of the participants in Saudi Arabia agreeing, and 74% from Peru and South Korea.

Global sentiments of AI-use in the Workplace

In 2018, the Boston Consulting Group in partnership with Ipsos have conducted a survey regarding sentiments and attitudes towards AI in workplace. The survey commenced in May 18 and ended on June 6, 2018, gathering 7, 077 participants who are 18 years old and above belonging to an active population – individuals who are working regardless of their field of work. BCG and Ipsos surveyed France, Germany, Spain, United Kingdom, United States, Canada, and China with each having 1,000 participants on average (Beauchene et al., 2023).

The survey found out that the participants of the survey with regards to AI sentiments and attitudes in workplace resulted in more curiosity than concern and being optimistic rather than indifferent about it. With 60% of the participant being curious, 40% reporting concerned about AI proliferation, and 35% optimistic about AI in workplace (Beauchene et al., 2013:, Rao, 2023:, BCG, 2018). However, when asked if there is already an AI-enabled tools or technologies in use in their workplace, 47% of the respondents said that there are none in use and that the current industry or company they work with have no plans in deploying AI-enabled tools.

Across the board, a large majority of the participants thinks that AI-enabled tools will have a positive impact on their work, with an average of 70% of the participants skewing towards the positive side of the Likert scale (BCG, 2018). In terms of implications towards organizations, participants generally felt that AI will positively affect their organizations, with an average of 71 percent of the respondents leaning towards positive outlook, however, when it comes on how AI will affect their individual lives, the result leaned on the negative side of the Likert scale, with an average of 50% of the participants believing that it will negatively impact their lives.

Lastly, less than a third of the participants expect the development of AI to revolutionize their workplace, with an average of 40% of the participants leaning towards AI as a technological milestone but will not be revolutionary in workplace settings or industries. Furthermore, although the participants of the survey do not expect their careers to disappear, most of the participants notably those who used AI at work thinks that AI in workplace will change the way they handle work and change how workplaces move (BGC, 2018, Beauchene et al., 2023, Rao, 2023).

Prospects of AI-use in the academe setting

With the surveys and studies conducted on global, regional, and national scales on the use of AI, sentiments and attitudes towards AI, and the perception, belief, and opinion about generative AI and its related tools and technologies garnering a more optimistic outlook and is likely seen to stay. Does this ring true within the academe industry?

Using a four-point Likert scale, the researcher conducted a survey towards academe practitioners regardless of sex and number of years in the academe industry. The survey consisted of six (6) sections, which the first section composed of the waiver of consent and data privacy clause, the second section about demographical questions, the succeeding sections inquires on the perception, belief, and opinion about AI-enabled tools and technologies in the academe industry. The survey ran from November 20 to December 04, 2023. Due to time limitations and concerns on communication and correspondence, the expected number of participants – which is more than 100 - was not met, only 31 individuals have participated in the survey conducted within the said period (see Appendix on the full details of the survey).

All participants have agreed to participate in the survey, in the second section of the survey, 13% (n=4) of the respondent have both administrative and teaching positions, with 87% (n=27) having a teaching position only. 48% of the participants teaches in the college undergraduate level with 23% teaching in senior high school, 7% (n=2) have doctorate degrees, while a big portion of the participants are masters degree holders (n=15).

Perceived benefits on the use of AI-enabled tools and technologies

The first part of the third section of the survey inquired on what the participants feel about the consequences of having AI-enabled tools and technologies in the workplace, 36% of the participants are curious about it, while both optimism and concern have 32% of the participants share. The second part of the section is where the four-point Likert scale begins, when participants were asked on the level of use if AI in the workplace, 65% of the participants (n=20) said that some form of AI-enabled tool or technology is already in use

With regards to AI's implication towards effectiveness of their work, 51% of the participants said that it is somewhat positively affecting their work effectivity, with 36% saying it had very positive effects, and 13% saying it is somewhat negative. In terms of results of their work, 58% of the participants said that AI somewhat made a positive implication with the products of their work, and 65% saying that it will somewhat positively affect how their work is organized. 61% and 67% respectively said that with the use of AI-enabled tools and technology it will somewhat positively affect the appeal of their work and their well-being at work.

In the aspect of workloads, the mean result of the five questions regarding integration of AI to relieve workloads, enhancing ability to meet deadlines and doing things, reducing risk at work and reduce committing errors at work, enhancing quality of work, and possible innovations of work have garnered 58% of participants saying that AI enabled tools and technologies will somewhat positively affect these aspects in workplace.

Perception of risks on the use of AI-enabled tools and technologies

When participants were asked if using AI-enabled tools and technologies would result to more control and surveillance in workplace, 52% said somehow it will, with 39% saying that it will result to more control and surveillance. 52% (n=16) said that somehow it will lead to job losses due to reduction of workload, and 48% of the participants (n=15) says that AI-enabled tools and technologies would somehow lead to dehumanization of work and less social cohesion.

Lastly, when participants were asked if AI and AI enabled tools and technologies would pose ethical problems with regards to protection of personal data, 52% said somehow it will, while 39% said that it will affect personal data. The results overall in this section of the survey generally lean towards the idea that AI-enabled tools and technologies will pose risks in the workplace.

Opinions about AI-enabled tools and technologies

Participants are then asked if AI will contribute to increasing or reducing inequalities and discrimination between highly educated and uneducated people, 61% said that AI will balance the disparity between highly educated and uneducated people. When asked if AI will contribute to an increase or decrease in partnership and cooperation between developed and developing countries, 55% (n=17) said that AI will increase partnership and cooperation between developing and developed countries.

Furthermore, participants are asked if AI-enabled tools and technologies will contribute to increasing or reducing discrimination between privileged and underprivileged backgrounds, 45% (n=14) said that AI will balance out, the same with increasing or decreasing gender gaps which garnered 58% saying it will balance out.

In the aspect of whether AI will be revolutionary or not in the aspect of how AI will affect employee specific tasks, development opportunities, how work is organized, and types of employees being hired, on average, 63% of the participants said that AI will be a technological milestone but not revolutionary.

Belief on the outcomes that will result due to AI-enabled tools and technologies

The last section of the survey form asked about belief and outcomes of integrating AI-enabled tools and technologies in the workplace. Here, the participants leaned towards the idea that their job, profession, and current institution will exist in the future, with 45% saying that their job will probably exist in the foreseeable future, 45% saying that their profession and institutions will probably exist in the foreseeable future.

In terms of whether their jobs will be transformed, 58% said that their jobs will probably be transformed due to AI, 48% said probably their profession will be transformed in the foreseeable future, 58% said probably their institution will be greatly transformed, and 45% said there is a probability that new jobs will be created.

Conclusion

In the case of sentiment towards AI-enabled tools and technologies in the academe industry, the survey showed that participants - regardless of the level of education institution they work and their educational attainment - are curious about AI and AI-enabled tools and technologies. This section of the survey showed the same result in the global survey that participants across industries are curious about the implications of AI both in their current work and prospects.

In the aspect of perception of benefits in using AI-enabled tools and technologies in the academe industry, majority of the participants agreed that somewhat the use of AI in the academe will affect their work positively in the aspect of management, organizational, and creative side. However, majority of the participants did agree that somewhat there will be risks in using AI such as risks on data privacy, surveillance during working hours, and most notably risks on dehumanization and unethicality within the academe workspace.

Most of the participants have agreed that AI will somehow balance everything which means that it is likely that gaps on access, equity, and education will still be evident according to the participants' opinions on how AI will affect social, economic, and political disparities. And lastly, majority in the academe industry believes that in the foreseeable future, their job, the profession they chose and graduated with, and the institution they currently work and contribute with will probably be not lost, however, the participants believe that AI and AI-enabled tools and technologies will somehow transform their job, their profession, and their institution.

Placing ethics in using AI and AI-enabled technologies in learning in 4IR

With these in mind, the researcher would like to recommend the following based on the results of the study. First is the availability of training academic practitioners in using AI-enabled tools and technologies as this will greatly enhance the way they organize and manage work in various subject fields and departments. According to Melo (2023), one of the key benefits in integrating AI in the academic setting is the ability to provide students with more personalized learning experiences within the classroom or outside of it (Melo, 2023). The author further noted that use of generative AI can make learning personalized by how AI can analyze the learning styles of each students based on algorithm.

The importance of training teachers and academe practitioners also boils down to the prospective use of generative AI and related tools and technologies in learning and teaching delivery. According to Bojorquez and Vega (2023) the use of Canva's magic features using artificial intelligence and ChatGPT for example induces a personalized learning experience and adaptive learning experience.

However, changing making teachers and academe practitioners be familiar with AI-enabled tools and technologies also means that regulating use is imperative, and that ethical use of AI and related services must be regulated by equipping teachers and academe practitioners necessary knowledge on how to combat AI-misuse. For Langreo (2023), educators and practitioners wants to know how to use AI effectively within school settings, in the conducted survey by EdWeek last June and July 2023, 62% of the participants wants to know how they (teachers and academe practitioners) will teach students how to use AI responsibly and effectively. This burden on teacher and academe industry training on effective, ethical, and responsible use of AI-enabled tools and technology is placed upon

researchers, institutions, and policy-makers on how to regulate AI-use without discrediting the benefits AI may bring to school settings such as adaptive learning (Langreo, 2023).

Conduction of the study

The researcher wishes to recommend to future researchers who wish to adopt this study to have ample time in gathering participants. The researcher acknowledges that the participant of the survey is too small to generalize, hence the quantitative design of the paper is further backed by sources using archival study methods and thematic analysis from gathered qualitative data.

Future researchers might wish to include specific details on available trainings on the use if AI-enabled tools and technology in the academe industry setting, ethical use of AI-enabled tools and technology, policy recommendations for management use of schools both basic education and higher education institutions, and trainings that not only cater on specific group of subjects or people but a more holistic approach in training use of AI and ethics in AI.

Due to the number of participants, further research is needed to investigate the future of AI-enabled tools and technologies within the academe industry in the fourth industrial revolution within the Philippine-context. Future research in the context of AI-enabled tools and technologies within the academe industry in the Philippines should focus on investigating their impact on academic performance, adoption rates, ethical implications, role in addressing educational inequality, and emerging trends in virtual reality, augmented reality, and natural language processing.

References

Agostino, D., Arnaboldi, M., Lema, M.D. (2021). New development: COVID-19 as an accelerator of digital transformation in public service delivery. Public Money and Management, 41 (1). 69-72. https://re.public.polimi.it/retrieve/handle/11311/1143405/614866/2020_AgostinoEtAl_ PMM.pdf.

Agrawal, M., Eloot, K., Mancini, M., Patel, A. (2020, July 29). Industry 4.0: reimagining manufacturing operations after COVID-19. McKinsey and Company. https://www.mckinsey.com/capabilities/operations/our-insights/industry-40-reimagining-manufacturing-operations-after-covid-19.

Beauchene, V., Bellefonds, N.D., Duranton, S., Mills, S. (2023, June 07). AI at work: What people are saying. Boston Consulting Group. https://www.bcg.com/publications/2023/what-people-are-saying-about-ai-at-work.

Black, K. (2010). Business Statistics: Contemporary Decision Making. 6th edition, John Wiley & Sons.

Bojorquez, H., Vega, M.H. (2023, May 31). The importance of artificial intelligence in education for all students. Language Magazine. https://www.languagemagazine.com/2023/05/31/the-importance-of-artificial- intelligence-in-education-for-all-students/.

Creswell, J. W., Creswell, J. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. 4th edition, Sage publications.

Duggal, A., Malik, P., Gehlot, A., Singh, R., Gaba, S. J., Masud, M., Al-miri, F., (2021). A sequential roadmap to industry 6.0: Exploring future manufacturing trends. IET Communications. https://doi.org/10.1049/cmu2.12284.

Elliot, R. (2021, January 26). Likert scale examples and definition. GeoPoll. https://www.geopoll.com/blog/likert-scale-examples-definition/.

Ghaffary, S. (2023, March 06). Silicon Valley's AI frenzy isn't just another crypto craze. Vox. https://www.vox.com/technology/2023/3/6/23624015/silicon-valley-generative-ai-chat- gpt-crypto-hype-trend.

Google Form. (2023, December 07). AI-enabled tools and technologies in the Academe: Progress or Regress?. https://forms.gle/GE7TzuuKQGHMWVjA7.

Google Spreadsheet. (2023, December 07). AI-enabled tools and technologies in the Academe: Progress or Regress?. https://docs.google.com/spreadsheets/d/1hWatoGsEEE4KM88NOpRXypuReXIbuei8k1bhIdenZRY/edit?usp=sharing.

Heath, C. (2023. December 07). What is purposive sampling?. Dovetail. https://dovetail.com/research/purposive-sampling/#:~:text=Purposive%20sampling%20is%20a%20technique,judgmental%20sampling%20or%20selective%20sampling.

Heilweil, R. (2023, January 05). What is generative AI, why is it suddenly everywhere?. Vox. https://www.vox.com/recode/2023/1/5/23539055/generative-ai-chatgpt-stable- diffusion-lensa-dall-e.

Kagee, A., Freeman, M. (2008). Mental Health and Physical Health (Including HIV/AIDS). https://doi.org/10.1016/B978-012373960-5.00045-9.

Langreo, L. (2023, September 20). What AI Training Do Teachers Need Most? Here's What They Say. Education Week. https://www.edweek.org/leadership/what-ai-training-do-teachers-need-most-heres-what-they-say/2023/09.

Lasi, H., Fettke, P., Kemper, H.G., Feld, T., Hoffmann, M. (2014). Industry 4.0. Business, Information, Systems, and Engineering. 6 (4), 239–242. https://doi.org/10.1007/s12599-014-0334-4.

Lu, M. (2023, March 09). Visualizing attitudes towards AI. Vox. https://www.visualcapitalist.com/visualizing-global-attitudes-towards-ai/.

Melo, N. (2023, February 16). Incorporating Artificial Intelligence Into The Classroom: An Examination Of Benefits, Challenges, And Best Practices. eLearning Industry. https://elearningindustry.com/incorporating-artificial-intelligence-into-classroom-examination-benefits-challenges-and-best-practices#:~:text=One%20of%20the%20key%20benefits,their%20individual%20needs%20and%20abilities.

Neighbors, C., Foster, D.W., Fossos, N. (2013). Peer influences on Addiction. Academic Press. 323-331. https://doi.org/10.1016/B978-0-12-398336-7.00033-4.

Ng, M., Koo, M., Haridas, G., Toh, J.T. (2023 May). The Economic Impact of Generative AI. Access Partnership. https://accesspartnership.com/wp-content/uploads/2023/05/Micr_GenAI_-Philippines_FINAL_230529.pdf.

Nickerson, C. (2023, October 16). Theory of Reasoned Action by Azjein and Fishbein. Simply Psychology. https://www.simplypsychology.org/theory-of-reasoned-action.html.

Palis, L.M. (2022, March 22). Education in time of pandemic. KPMG. https://kpmg.com/ph/en/home/insights/2022/03/education-in-the-time-of-a-pandemic.html.

Park, E., Gelles-Watnick, R. (2023, August 28). Most Americans haven't used ChatGPT; few think it will have major impact on their job. Pew Research Center. https://www.pewresearch.org/short-reads/2023/08/28/most-americans-havent-used-chatgpt-few-think-it-will-have-a-major-impact-on-their-job/.

Routley, N. (2020, November 27). 5 big picture trends being accelerated by the pandemic. Visual Capitalist. https://www.ipsos.com/en-ca/news-polls/global-opinions-about-ai-january-2022.

Schwab, K. (2015, December 12). The Fourth Industrial Revolution. Foreign Affairs. https://www.foreignaffairs.com/world/fourth-industrial-revolution.

Schwab, K. (2016, January 14). The fourth industrial revolution: what it means and how to respond. World Economic Forum. https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/.

Smith, T. (2022, April 02). Disruptive Technology: Definition, Example, and How to invest. Investopedia. https://www.investopedia.com/terms/d/disruptive-technology.asp.

Steven R. Smith, The Fourth Industrial Revolution and Legal Education, 39 GA. ST. U. L. REV. 337 (2023).

Supply Chain and Management SAP. (n.d.). What is industry 4.0?. https://www.sap.com/products/scm/industry-4-0/what-is-industry-4-0.html#:~:text=Industry%204.0%20can%20be%20defined,Data%2C%20robotics%2C%20and%20automation.

Affiliations and Corresponding Information

Francisco L Sanchez Jr.
De La Salle University – Philippines