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ARTIFICIAL INTELLIGENCE INTEGRATION IN ESL EDUCATION: OPPORTUNITIES AND CHALLENGES

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Abstract: Artificial intelligence (AI), known by some as the industrial revolution (IR) 4.0, is going to change not only the way we do things, how we relate to others, but also what we know about ourselves. This article will first examine what AI is, discuss its impact on industrial, social, and economic changes on humankind in the 21st century, and then propose a set of principles for AI bioethics. The IR 1.0, the IR of the 18th century, impelled a huge social change without directly complicating human relationships. Modern AI, however, has a tremendous impact on how we do things and also the ways we relate to one another. Facing this challenge, new principles of AI bioethics must be considered and developed to

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provide guidelines for the AI technology to observe so that the world will be benefited by the progress of this new intelligence. Our research project, titled “The Impact of Artificial Intelligence on Humanity,” explored how AI is reshaping modern society, focusing on its opportunities and challenges across various sectors. The main goal of our team project was to evaluate the dual nature of AI’s influence—its transformative benefits and the potential social, ethical, and economic risks it presents.

Key words: Artificial intelligence, Bioethics, Principles of artificial intelligence bioethics.

Artificial intelligence (AI) has many different definitions; some see it as the created technology that allows computers and machines to function intelligently. Some see it as the machine that replaces human labor to work for men a more effective and speedier result. Others see it as “a system” with the ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation (A. Kaplan, M. Haenlein, 2009). Along with the rapid development of cybernetic technology in recent years, AI has been seen almost in all our life circles, and some of that may no longer be regarded as AI because it is so common in daily life that we are much used to it such as optical character recognition or the Siri (speech interpretation and recognition interface) of information searching equipment on computer (Roger C. Schank. 1991).

From the functions and abilities provided by AI, we can distinguish two different types. The first is weak AI, also known as narrow AI that is designed to perform a narrow task, such as facial recognition or Internet Siri search or self-driving car. Many currently existing systems that claim to use “AI” are likely operating as a weak AI focusing on a narrowly defined specific function. Although

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this weak AI seems to be helpful to human living, there are still some think weak AI could be dangerous because weak AI could cause disruptions in the electric grid or may damage nuclear power plants when malfunctioned. The new development of the long-term goal of many researchers is to create strong AI or artificial general intelligence (AGI) which is the speculative intelligence of a machine that has the capacity to understand or learn any intelligent task human being can, thus assisting human to unravel the confronted problem. While narrow AI may outperform humans such as playing chess or solving equations, but its effect is still weak. AGI, however, could outperform humans at nearly every cognitive task.

Despite the different definitions, the common understanding of AI is that it is associated with machines and computers to help humankind solve problems and facilitate working processes. In short, it is an intelligence designed by humans and demonstrated by machines. The term AI is used to describe these functions of human-made tool that emulates the “cognitive” abilities of the natural intelligence of human minds.

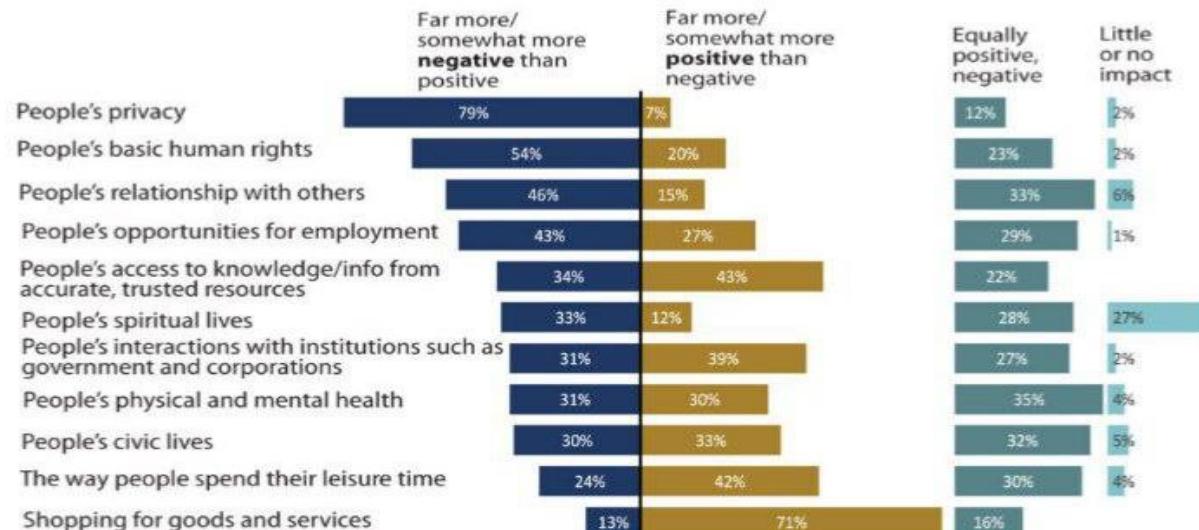
Strong AI is a different perception of AI that it can be programmed to actually be a human mind, to be intelligent in whatever it is commanded to attempt, even to have perception, beliefs and other cognitive capacities that are normally only ascribed to humans. Automation: What makes a system or process to function automatically. Machine learning and vision: The science of getting a computer to act through deep learning to predict and analyze, and to see through a camera, analog-to-digital conversion and digital signal processing. Natural language processing: The processing of human language by a computer program, such as spam detection and converting instantly a language to another to help humans communicate. Robotics: A field of engineering focusing on the design and manufacturing of cyborgs, the so-called machine man. They are used to perform tasks for human's convenience or

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something too difficult or dangerous for human to perform and can operate without stopping such as in assembly lines.

Self-driving car: Use a combination of computer vision, image recognition amid deep learning to build automated control in a vehicle.

Picture 1. Experts view on AI's level of impact on people's personal lives.



Is AI really needed in human society? It depends. If human opts for a faster and effective way to complete their work and to work constantly without taking a break, yes, it is. However if humankind is satisfied with a natural way of living without excessive desires to conquer the order of nature, it is not. History tells us that human is always looking for something faster, easier, more effective, and convenient to finish the task they work on; therefore, the pressure for further development motivates humankind to look for a new and better way of doing things. Humankind as the homo-sapiens discovered that tools could facilitate many hardships for daily livings and through tools they invented, human could complete the work better, faster, smarter and more effectively.

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The invention to create new things becomes the incentive of human progress. We enjoy a much easier and more leisurely life today all because of the contribution of technology. The human society has been using the tools since the beginning of civilization, and human progress depends on it. The human kind living in the 21st century did not have to work as hard as their forefathers in previous times because they have new machines to work for them. It is all good and should be all right for these AI but a warning came in early 20th century as the human-technology kept developing that Aldous Huxley warned in his book *Brave New World* that human might step into a world in which we are creating a monster or a super human with the development of genetic technology.

Besides, up-to-dated AI is breaking into healthcare industry too by assisting doctors to diagnose, finding the sources of diseases, suggesting various ways of treatment performing surgery and also predicting if the illness is life-threatening (Jacob R., 1976). A recent study by surgeons at the Children's National Medical Center in Washington successfully demonstrated surgery with an autonomous robot. The team supervised the robot to perform soft-tissue surgery, stitch together a pig's bowel, and the robot finished the job better than a human surgeon, the team claimed. It demonstrates robotically-assisted surgery can overcome the limitations of pre-existing minimally-invasive surgical procedures and to enhance the capacities of surgeons performing open surgery.

Picture 2. The impact of AI on humanity

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON HUMANITY

A Comprehensive Analysis of Opportunities and Challenges
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Introduction

Artificial Intelligence is no longer a futuristic concept; it is a present-day reality reshaping our world. From healthcare to transportation, AI's integration is profound and accelerating. This research explores the dual-edged nature of AI, examining its transformative benefits and the significant ethical, social, and economic challenges it presents.

Objective

This research aims to systematically investigate the multifaceted impact of Artificial Intelligence on human society, moving beyond general discourse to provide a structured analysis of its specific benefits and challenges.

- **Principle Goal:** To evaluate the dual nature of AI's influence across key sectors, including the economy, healthcare, education, and ethics.
- **Key Focus Areas:**
 - To quantify and qualify public perception and readiness for AI integration in daily life and work.
 - To identify the most significant opportunities AI presents for solving complex human problems.
 - To analyze the most pressing risks, including job displacement, ethical dilemmas, and security concerns.
 - To provide data-driven recommendations for harnessing AI's potential while mitigating its dangers.

Conclusion

Our research concludes that Artificial Intelligence is a powerful, dual-force technology whose trajectory must be guided by intentional human action.

Key Findings:

1. **The Job Market Will Transform, Not Disappear:** A net gain of 12 million jobs is projected, but this requires massive reskilling initiatives to manage the transition.
2. **Public Perception is Mixed:** While fear and optimism coexist, effective policy must address both to ensure public trust and adoption.
3. **The Greatest Benefits are Societal:** The most significant positive impacts of AI are anticipated in critical sectors like healthcare and education, promising solutions to long-standing human challenges.

Methodology

We employed a mixed-methods approach to ensure a comprehensive and data-driven analysis.

- **Literature Review:** We conducted an extensive review of over 5 academic publications, industry reports, and credible articles to establish a foundational understanding of AI's global impact and identify key themes for investigation.
- **Data Collection:** We successfully gathered responses from a diverse group of 10+ respondents.
- **Comparative Analysis:** Survey data was compared against trends and statistics from our literature review to identify alignments and disparities between public opinion and expert predictions.

Results

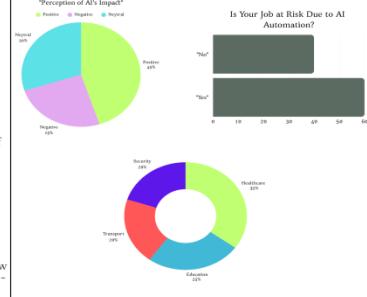
Our study yielded the following key findings from the survey and literature synthesis:

- Public sentiment is cautiously optimistic, with 45% of respondents viewing AI's impact on their future as positive.
- Job displacement is a major concern, with 60% of respondents believing their current job could be at risk due to AI automation.
- Healthcare is the most anticipated sector for AI benefits selected by 35% of participants as the area where they expect the most significant positive impact.
- Global analysis confirms a dual impact: While 85 million jobs may be displaced by 2025, 97 million new roles are expected to emerge, adapting to the new AI-driven economy.

Analysis

We analyzed the collected data to uncover the underlying reasons and implications of our findings.

- **Survey Data Correlation:** The high concern for job loss (60%) directly correlates with the World Economic Forum's prediction of significant workforce disruption, indicating public aversion to job loss.
- **Sentiment vs. Sectoral Hope:** The optimism (45%) is likely driven by the anticipation of AI solving critical problems in desired fields like healthcare, suggesting that people distinguish between personal risk and societal benefit.
- **Visual Data Breakdown:** The following charts provide a clear, at-a-glance understanding of our core survey results.



Recommendations for Future Action:

- **For Policymakers:** Develop robust ethical guidelines and invest in public education and reskilling programs.
- **For Educators:** Integrate AI literacy and future-ready skills into curricula at all levels.
- **For Industry:** Lead with transparent and human-centric AI development, prioritizing augmentation over mere automation.

Above all, we see the high-profile examples of AI including autonomous vehicles (such as drones and self-driving cars), medical diagnosis, creating art, playing games (such as Chess or Go), search engines (such as Google search), online assistants (such as Siri), image recognition in photographs, spaces filtering, predicting flight delays...etc. All these have made human life much easier and convenient that we are so used to them and take them for granted. AI has become indispensable, although it is not absolutely needed without it our world will be in chaos in many ways today.

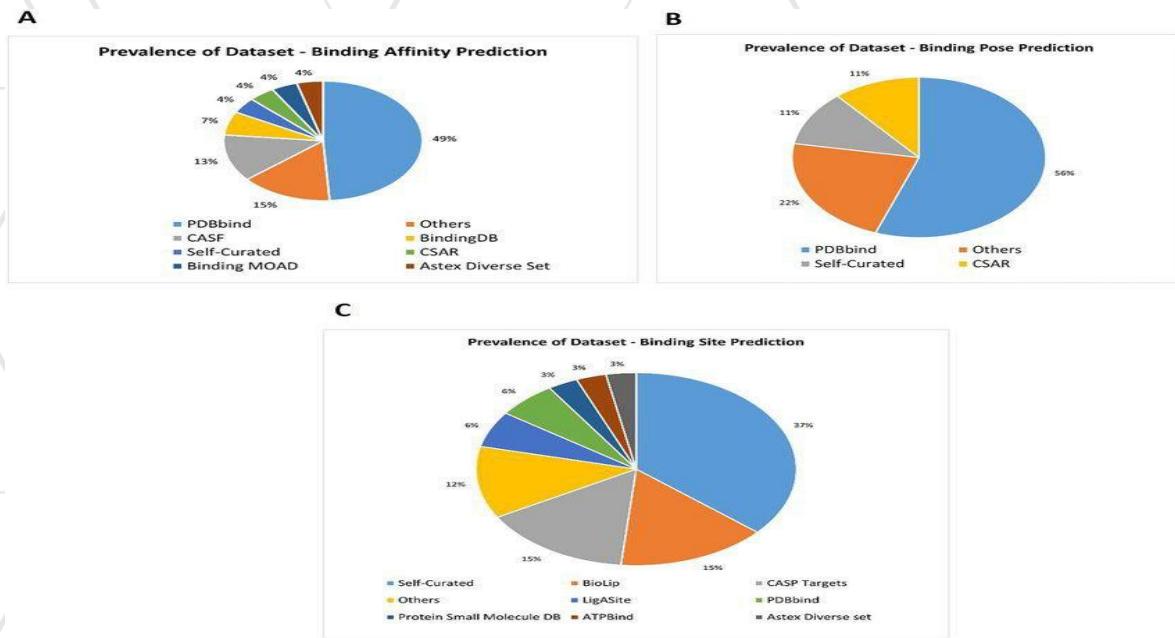
Negative impact

Questions have been asked: With the progressive development of AI, human labor will no longer be needed as everything can be done mechanically. Will humans become lazier and eventually degrade to the stage that we return to our primitive form of being? The process of evolution takes eons to develop, so we will not notice the backsliding of humankind. However how about if the AI becomes so powerful

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that it can program itself to be in charge and disobey the order given by its master, the humankind?

Picture 3. Survey results.



A huge social change that disrupts the way we live in the human community will occur. Humankind has to be industrious to make their living, but with the service of AI, we can just program the machine to do a thing for us without even lifting a tool. Human closeness will be gradually diminishing as AI will replace the need for people to meet face to face for idea exchange. (Nilsson JN., 1980) AI will stand in between people as the personal gathering will no longer be needed for communication.

Unemployment is the next because many works will be replaced by machinery. Today, many automobile assembly lines have been filled with machineries and robots, forcing traditional workers to lose their jobs. Even in supermarket, the store clerks will not be needed anymore as the digital device can take over human labor. Wealth inequality will be created as the investors of AI will take up the major share of the earnings. The gap between the rich and the poor will

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be widened. The so-called “M” shape wealth distribution will be more obvious. New issues surface not only in a social sense but also in AI itself as the AI being trained and learned how to operate the given task can eventually take off to the stage that human has no control, thus creating un-anticipated problems and consequences.

There are, however, many positive impacts on humans as well, especially in the field of healthcare. AI gives computers the capacity to learn, reason, and apply logic. Scientists, medical researchers, clinicians, mathematicians, and engineers, when working together, can design an AI that is aimed at medical diagnosis and treatments, thus offering reliable and safe systems of health-care delivery. As health professors and medical researchers endeavor to find new and efficient ways of treating diseases, not only the digital computer can assist in analyzing, robotic systems can also be created to do some delicate medical procedures with precision.

Here, we see the contribution of AI to health care. Fast and accurate diagnostics IBM's Watson computer has been used to diagnose with the fascinating result. Loading the data to the computer will instantly get AI's diagnosis. AI can also provide various ways of treatment for physicians to consider. The procedure is something like this: To load the digital results of physical examination to the computer that will consider all possibilities and automatically diagnose whether or not the patient suffers from some deficiencies and illness and even suggest various kinds of available treatment.

Picture 4. Survey results.

Socially therapeutic robots

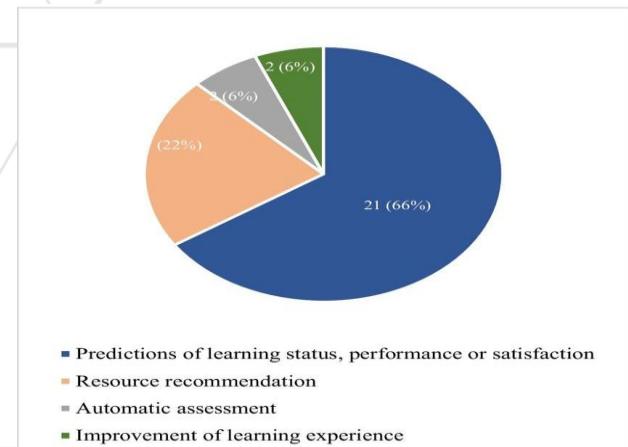
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Pets are recommended to senior citizens to ease their tension and reduce blood pressure, anxiety, loneliness, and increase social interaction. Now cyborgs have been suggested to accompany those lonely old folks, even to help do some house chores. Therapeutic robots and the socially assistive robot technology help improve the quality of life for seniors and physically challenge.

CONCLUSION

AI is here to stay in our world and we must try to enforce the AI bioethics of beneficence, value upholding, lucidity and accountability. Since AI is without a soul as it is, its bioethics must be transcendental to bridge the shortcoming of AI's inability to empathize. AI is a reality of the world. We must take note of what Joseph Weizenbaum, a pioneer of AI, said that we must not let computers make important decisions for us because AI as a machine will never possess human qualities such as compassion and wisdom to morally discern and judge (Roger C. 1991). Bioethics is not a matter of calculation but a process of conscientization. Although AI designers can up-load all information, data, and programmed to AI to function as a human being, it is still a machine and a tool.

AI will always remain as AI without having authentic human feelings and the capacity to commiserate. Therefore, AI technology must be progressed with extreme caution. As Von der Leyen said in White Paper on AI – A European approach to excellence and trust: "AI must serve people, and therefore, AI must always comply



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with people's rights.... High-risk AI. That potentially interferes with people's rights has to be tested and certified before it reaches our single market".

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