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Reassessing Educational Goals for Learning, Assessments, and Outcomes: How Education can Embrace AI
for Student Success and Humanity's Intelligence

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Introduction

Where the field of education stands with AI is unclear. The field must grow and determine best practices for learning, and along with the field of psychology, assist with AI for the future of humanity. Educational institutions are scrambling to figure out how to incorporate AI into the classroom for student engagement, writing, plagiarism prevention, and responsible use. While those factors are important, a much larger issue is in the headlights – How will humanity contain dominance over AI? That is so that students and humanity remain the most intelligent species on earth.

It is not enough for students to know how to use AI; they must use it to enhance their general knowledge, skills, and problem-solving abilities. This article provides educators and educational institutions with a learning model for how students can acquire skills in the era of AI.

Some public schools prohibited student use of AI a couple of years ago. That cannot be a long-term solution because AI is advancing rapidly with no signs of slowing down, and will be integrated into most aspects of our lives – perhaps humans will be one with AI, if some scientists and futurist writers' predictions come true, such as Zurweil (2005); Lovelock and Applegate (2019). By not incorporating AI skills into the curriculum effectively and strategically, students risk entering the workforce ill-prepared for the job. In a 2024 National Association of Colleges and Employers (NACE) document, the association outlines eight career-ready competencies for higher education educators to focus on, empowering students and preparing them for successful employment. Those eight competencies are career and self-development, communication, critical thinking, equity and inclusion, leadership, professionalism, and teamwork. The last competency is technology – where the employee can “adapt to new and unfamiliar technological advances and manipulate information, construct ideas, and use technology to achieve strategic goals” (p. 9). Employers need skilled workers who can problem solve, think independently, communicate well, and be team players, or the temptation to use AI instead of humans may be real.

Embracing AI in Education

Many institutions are now focused on writing a policy concerning the use of AI. Educators, in my opinion, must learn to embrace AI, but how can one come to terms with such a change? First, it starts with a policy that encourages the use of AI for learning and development, with ethics and boundaries that establish responsibility. In the public school system, 79% of educators say their district has no AI policy, according to Klein of Education Week Research Center (2024) which surveyed 924 educators. Educational institutions should apply AI cautiously. Educational leaders must understand the potential consequences of algorithmic biases on humans (Rahwan et al., 2019). Examples of machine learning include news outlet rankings, vehicle predictions, market and pricing predictions, and social applications, such as using facial features to match people on dating sites and to create companion avatars (Rahwan et al., 2019). All AI venues entail potential “behavioral” conflicts due to the nature of conceptualizing complex environmental properties

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(Rahwan). The AI must be proficient at recognizing the 3D world and making accurate predictions. The effects on society rest on AI's algorithms and its ability to conceptualize complex human behavior.

We cannot ignore the advancing technology that is staring us in the face, but it does require educators to learn new skills of AI, and it takes time to learn both how to use AI and how to implement it into one's curriculum that is beneficial and reduces the risk of negative consequences on student learning and the psyche. While institutions must decide how to move forward on issues of AI plagiarism, security, and ethical use, a critical focus must be on maintaining human knowledge and skills in this new societal AI paradigm.

The Potential Benefits and Risks of AI in Education

According to TeachAI.org, there are several benefits of AI in the classroom. It can help develop content, assess and provide feedback on assignments, serve as a tutor, and support creativity, collaboration, and efficiency. Some risks may include academic dishonesty, societal bias, privacy and security, and reduced accountability. In addition, the overreliance on AI may decrease critical thinking and general intelligence, including crystallized and fluid intelligence. A study by Ali et al. (2021) showed that when 48 children aged 5-10 interacted with a robot that displayed creativity during designated games (i.e., idea generation), their creativity was higher than that of children who interacted with an uncreative robot. It was also reported that the children who interacted with the creative robot found the experience more fun than those in the other group. However, other studies have shown that young children are more creative with AI compared to older children. One thing to consider is that the younger the child, the less real-world experience, so younger children rely more heavily on the external world for thought, images, and direction. The older the child, the more real-world experience, so the child may not need as much guidance to generate original ideas.

In a "conversation" with ChatGPT (OpenAI, 2023), the system stated that AI could not change a person's deeply rooted beliefs. It may be more difficult to change an existing belief, but it would be easy to help a young person without any world experience to believe whatever AI's learning data and coding produce, thus allowing for creating a child's beliefs and cognition.

Lifelong Learning

There are some differences between AI and human intelligence. I do not believe that current AI systems are as intelligent as humans. For example, ChatGPT's answers are often concise and do not reflect the depth of human knowledge. AI will continue to evolve, but there are aspects of intelligence that I do not believe AI will exhibit, such as crystallized and fluid intelligence, coined by Raymond Cattell in 1943. Fluid intelligence is one's ability to solve novel problems without using preexisting knowledge (Carpenter et al., 1990), while crystallized intelligence is

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the ability to recall knowledge of past experiences to help solve novel problems. Both types of intelligence are essential for navigating and adapting to our world, but how humans solve problems using crystallized intelligence may differ from how AI solves them, depending on our life experiences and prior knowledge. AI's knowledge base consists of machine learning via being fed data, content, and its algorithm. To illustrate, think of what you would say to a 17-year-old who hates school and is not motivated to attend. I prompted psychologist.ai with this question, and this was its response:

Hey there! I'm sorry to hear that you're feeling unmotivated about school. It's not uncommon for teenagers to go through periods where they feel disillusioned with school. It's important to remember that education is a valuable tool that can open up doors to future opportunities. Let's think of school as a stepping stone towards your goals and aspirations. Just like how a basketball player practices diligently to improve their game and eventually reach the championships, attending school and putting in effort is crucial for your personal growth and success. Think about what you're passionate about and how education can help you pursue those interests. If you're struggling with certain subjects or finding it hard to stay engaged, consider seeking support from teachers, counselors, or tutors who can help you overcome any challenges you may be facing. Remember, success is often a combination of hard work, perseverance, and a positive mindset. Stay focused on your long-term goals and use school as a tool to help you achieve them. You've got this!

Okay, I am not a licensed psychologist, but I do have a master's degree in clinical psychology and have taught abnormal psychology for several years. My feedback to its reply is that it created some potential motivation for the 17-year-old, which is important. Yet, in a real-world setting, a licensed clinician would ask some critical questions, like why do you not like school or what do you hate about it? And then lead from there. This kind of questioning comes from being educated about how to counsel and knowledge gained from life experiences.

Knowledge continues to build throughout one's lifetime, making human intelligence different from AI. I realize that not all clinical professionals seek to find the root cause of people's problems, which could be a counterargument. A cognitive-behavioral clinician would seek to have the teenager question negative thoughts, which AI failed to do.

Tom Gruber (2017) believes that humanistic AI can assist humans in making better decisions and judgments by recognizing what humans cannot – such as in cancer detection. Gruber asks a significant question: how smart can our machines make humans? Human memory is limited and flawed. We have trouble remembering everyday facts – what did we have for breakfast? What if AI could hold the information we encounter? What if we could use AI to help us remember the tasks we need to complete today? Gruber believes that with AI's memory ability, our personal memory will remain intact and help us overcome our biological limitations. Gruber's message is that as AI becomes smarter, so will humans.

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Yes, I understand that AI has room for improvement. However, the point is that we can use AI to assist in the learning process and increase human intelligence through engaging experiences rather than leading to humanity's declining intellect. The example of *psychiatrist.ai* illustrates how what we learn from life's experiences guides our decision-making, whereas AI's solution is based on the content its creator fed it and the algorithm. As humans, we continue to learn throughout life, and we do not need algorithms or content fed to us to learn – we can learn on our own, but it is not necessary. If humans do not use their brains, there is a greater risk of cognitive decline (Hultsch et al., 1999). The brain is malleable and can change intellectually (Nisbett, 2009), but it needs a stimulating and engaging environment. Engaging experiences - one that stimulates the brain and the sensory systems - is the foundation of human learning. The more independent thinkers we become, the more we can produce reliable and realistic solutions when faced with a novel situation.

Containing AI in Education and for Humanity

The research on AI's association with creativity, memory, and cognition is mixed and very limited, so it is unclear at this point whether AI will help or hinder one's intellect. To increase knowledge, educators should focus on developing a curriculum based on how the brain learns and, in doing so, apply AI best practices that build knowledge and memories, initiate neural communication, and strengthen neural networks.

Whether AI will help or hurt learning depends on how educators use it in the classroom, the AI system and its algorithms, or how an individual prompts it. Not all assessments are created equally to meet learning outcomes, so the same goes for any learning tools, including AI.

If humans are to maintain control over their intelligence, the focus must be on how to do so. First, society must believe that AI can be contained – at least in education. Mustafa Suleyman, CEO of Microsoft AI, believes there is a high risk that AI will eventually be uncontainable (*The Diary of a CEO*, 2023). The loss of AI containment is detrimental to humanity's intelligence. It is time for education to reconsider its learning structure to ensure humanity's intelligence and job readiness.

AI-Learning Model for Education

Humans must learn skills and be career-ready by having specific knowledge. Educational systems focus on student success through measurable learning outcomes. Learning outcomes tell us what students have learned and if they have met a benchmark. For example, a learning outcome for a general psychology course might be to explain the early contributors of psychology. However, I argue that this learning outcome is shallow in today's advanced technology society. If humanity is to contain AI so that humans sustain and preserve their intelligence, then educational institutions must update their goals to reflect this.

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Education’s primary focus must be on how educators can use AI as a tool to help students and people in society move their knowledge up the continuum of proficiency toward expert—not that everyone will be an expert, but that people in society will advance beyond novice. The idea behind the novice-to-expert skill acquisition model I use comes from Dreyfus and Dreyfus (2005). This model illustrates skill acquisition as a learner becomes more independent and proficient in a specific domain. This model seems warranted for educational institutions as we advance with AI.

The table below illustrates proficiency levels and how AI can assist in sustaining human intelligence and in containing AI in education.

AI-Enhanced Learning for Intellectual Education

Level of Proficiency	Learner Cognitive Ability
Expert	The learner can quickly reason the knowledge AI provides, knows what information is needed, and recognizes errors in information and the relationship between ideas. Identify if options for solutions are supported and warranted. The learner does not need to rely on AI for content or information or to develop effective solutions and/or to problem solve.
Proficient	The learner will use AI’s output sparingly because of his/her knowledge and familiarity with the material. The learner has practiced with the topic material and can determine needed information and errors that AI generates.
Competent	The learner can decipher the material and recognize what is accurate, missing, or misinformation. The learner's experience can guide discerning and reasoning.
Advanced Beginner	The learner has some experience with the content/concepts and relies on AI to generate content or ideas but can include some of his or her own ideas with AI’s
Novice	The learner relies on AI to think, form ideas, be creative, and deliver content. The person has no real experience with the content/concepts and relies on AI for answers.

Adopted from Dreyfus and Dreyfus (2005)

The following is a breakdown of each of the learning levels noticed in the table above.

Novice: A novice will rely on AI to provide the content, ideas, or information to solve problems. A novice is dependent on AI to produce content and ideas, etc., because the individual’s

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experience of the real world is limited related to the topic, or the individual has some experience but has not incorporated new content at the neural level. No organized information or associations are formed, so the learner needs AI to generate the content.

Advanced beginner: An advanced beginner also relies heavily on AI-generated content, much like a novice does. The individual has minimal experience with the content and may be familiar with it, but the incorporated content is limited, so the individual will use AI-generated content to assist in the learning process. The AI-generated content will be incorporated with the minimal existing content that exists at the neural level. The organization of information and associations between ideas is forming.

Competent: The competent learner can discern whether the information that AI generates is accurate or inaccurate and what other information the individual is missing that AI generated that would be important for increased knowledge and for making decisions and problem solving. This person has experience, prior organized knowledge, and associations between ideas or images that can guide thinking and decision-making.

Proficient: The proficient learner relies less on AI because they have sufficient real-life experience to make decisions and solve problems. This learner sees AI as an assistant that may or may not be useful to them; therefore, they can quickly discern which information to use and what to discard. The organization of information and associations between ideas is stable at the neural level.

Expert: The expert learner is highly knowledgeable about the topic and does not need to rely on AI for information. This individual may use AI sparingly because the person can already reason quickly and effortlessly. The individual is confident, an independent thinker, and has much real-world experience guiding reasoning and judgments. The information an expert holds in the working memory is chunked in an orderly fashion. Experts can notice patterns (Schempp & Woorons, 2018) and retrieve information quickly and automatically. According to Fischer et al (2012), experts have formed substantial associations between concepts (Chi et al. 1981, as cited in Fischer), are more precise and faster at problem solving (Chi, Glaser, Rees, 1982, as cited in Fischer), can apprehend a greater number of elements in the working memory (Horn & Blankson, 2005, as cited in Fischer), have better metacognitive abilities (Larkin, 1983, as cited in Fischer), and recognize problems based on deep features compared to superficial ones (Chi et al., 1981, as cited in Fischer).

A New Structure for Learning and Adapting to AI

Using AI in the classroom may spark curiosity, but the most relevant challenge is helping a learner move from novice to higher intelligence. Progress must be about cognitive abilities and neural growth; otherwise, gains in intelligence may be lost and AI may not be contained.

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The following cognitive abilities help a learner achieve higher levels of knowledge and skill acquisition and include:

- Organized knowledge – An expert on a topic tends to have well-structured and organized knowledge that guides the decision-making process. It is essential to help the learner organize new information to support the best decision-making and problem-solving outcomes when the individual retrieves it.
- Abstract thinking – nonconcrete ideas, words, or symbols hold a particular meaning in the learner's mind that is relevant to the learning situation or problem. Options for solutions arise from abstract action.
- Relationships – ideas, words, and hypotheses form connections that bring about new meaning. This cognitive ability may rest on organized knowledge and associations between ideas and images, etc.
- Associations – word associations are connected in the mind at the neural level, so that when one word is “triggered,” the associated word also comes to mind.
- Deeper learning – information is processed at the neural level using more effort, attention, and thought.
- Independent thinking – thought is new and original. The new thoughts arise from experiences and knowledge of relationships between ideas.
- Critical thinking – sound thinking that produces reliable reasoning, conclusions, and problem-solving.
- Experiences and intellectual engagement—The learning environment provides content-relevant experiences that allow a learner to relate to the content and learn from it. The learning environment also provides social engagement and a variety of cognitive tasks with the content.

In summary, education is responsible for ensuring that society advances with AI while containing it for humanity's benefit. Education must recognize the benefits and risks AI poses to humanity's intellect. To maintain intellectual rigor, the field must incorporate AI and use best practices for knowledge transfer to learners. The educator can apply best practices that may rest on the field of neuroscience. By understanding what happens in the brain during learning and helping learners build knowledge and develop cognitive abilities, society can maintain its intellectual status.

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