Rosemary Papa
Karen Moran Jackson *Editors*

# Artificial Intelligence, Human Agency and the Educational Leader

Springer

funding formulas. Four major actions that can and should be taken to realize the equitable and accessible educational environment are as follows:

1. Convene a commission of top thinkers from the fields of education, technology, business, manufacturing, and public service, and give them a specific charge to create a more effective and efficient educational system that utilizes artificial intelligence and augmented reality as a core component of a child's educational experience. This may lead to a more of a humanistic experience as we inevitably move toward a cybernetic future.
2. Pass legislation that provides free high-quality internet access to homes as a part of city services. This is essential to ensure that all families and children have access and are not left behind.
3. Examine funding mechanisms to decentralize education in a way that gives parents choice and that improves teacher pay and increases accountability for teachers as we move toward a more decentralized model of education.
4. More study is needed in the area of convivial technology and like conceptual frameworks that may serve as a guideline of how to restructure education with intentionality in order to create a more connected, trustful, synergistic, and adaptable future not focused on individualistic competitiveness.

Another vignette of the future is depicted by Dr. Bryan P. Sanders, called STEAMHAMLET. This optimistic vision builds on the concepts of innovative schools that embrace making and doing in collaboration. Sanders' STEAMHMALET vision is filled with student-centered, multidisciplinary spaces that leverage data and technology for student learning.

## Vignette: STEAMHAMLET Is School 2051

Bryan P. Sanders
Loyola Marymount University
Los Angeles, CA, USA

**Vignette**

Common. List of video clips curated on a theme. Uncommon. Virtual space to view and edit the clips concurrently. Common. Written analysis of current structural engineering trends. Uncommon. Immersive experience walking through a building and making adjustments.

Enter a classroom that has access to every document. It's a room of possibilities. We still call it school for legacy reasons, but we are searching for

another word. It looks nothing like the familiar rows and columns of desks. The six walls of the room are instantly different from any other cube space you've visited. Their material is unknown to you. You feel something different when in this room. You have the sensation that you are deep underground.

The room has a quiet cave coolness. Comfortable and modular furniture appear arranged to fit the work of the previous visitors. Also noticeable are more familiar items from what people in 2020 call a makerspace: cameras, screens, computers, microcontrollers, wires, batteries, boxes of LEGO, robot parts, pencils, papers, measurement tools, and numerous handmade projects in various stages of completion.

You are inside STEAMHAMLET. It is a room of possibilities. It can project editable holograms for its users to test out concepts and prototypes. It is called STEAMHAMLET because it consciously puts back into one learning experience all of the subjects that school mistakenly and artificially separates: Science, Technology, Engineering, Art, Mathematics, History, Art, Music, Language, English, and Theater. Art appears twice not by accident in the name and emphasis, but on purpose. Art represents and communicates essential cultural and aesthetic values that humans consciously use to demonstrate their positionality and politics. Art is our most valuable form of irrationality where we can be emotional and expressive in pursuit of ideas.

Ideas. They come from an invisible space. They enter the visible through enormous effort. Directed by imagination, and intellect supplying the props, a product comes into being. It has a raw, newly hatched essence that the creator typically wants to preserve throughout the stages of creation. And that might be possible if this were one person's film or album or novel or sculpture. But here, in the STEAMHAMLET room, the stages of creation belong to the collective. Each individual participating is both the audience and the creator. The future of teaching and learning happens in schools that care not for your performance on a silent paper-pencil test. Instead, the focus is now on the collective making something together.

You can make anything here inside of STEAMHAMLET. It contains everything. And all things are fungible objects. By listening to the sound of your voice, the machine produces a representation of the new stage prop. Change it; shift it; edit it; make it useable to suit the needs of the project. Everything already documented and, in the libraries, can become an object to place upon the hologram stage. Sounds, images, events, texts, films, animals, places, objects, people—you can quite literally call in everything to test and try.

Pulling from existing databases, clearinghouses, and digital archives, all ideas and artifacts in recorded history are movable objects projected by STEAMHAMLET in this shared space. No special glasses or goggles are necessary: Imagine students working collaboratively in a room where they can pinch, move, scale, mash up, replace, alter, add, and edit any informational object in an easily manipulated hologram projection.

Rapidly, the invisible becomes visible as objects are called on stage. Moving from the nebulous space of the mind, ideas can be seen and heard. As objects are juxtaposed together and explored, pathways to new ideas emerge. The students and teachers are creating and observing, observing and creating. The teaching and learning cycle shifts dramatically in this extended reality hologram classroom.

The questions are next, and these are the kinds of questions that educators have asked for 120 years as traditional school developed and dominated: What constitutes getting work done? Or completing a lesson? Or assessing progress? How will we rank and order students for matriculation and admissions to the university? STEAMHAMLET could be used for pure imagination, pure creativity, or pure practicality—and of course, in any combination. But one must remember STEAMHAMLET is not only the classroom and the curriculum, but it is also the pedagogy and the assessment. We have obliterated the artificially created barriers of traditional school.

Specialized or proprietary data can also be loaded into STEAMHAMLET for private editing and use. This is the world's largest storytelling and innovation machine. It has universal application and fits into a vision of education that places a greater value on ideas and creation over grades, test scores, and units of study. People are waking up to the fact that in the year 2020, our technology capabilities have far surpassed our antiquated use. Some schools are still clinging to a 1995 version of technology focused on transactional use, and it wasn't a great idea then!

What we have done with computer technology since the 1960s to transform how we work and think in healthcare and art shows our potential for change. The computer is a brain to think with and should never be a kiosk to simply answer some prewritten questions. Schools, however, have largely used computers as replacements of paper and collaborative class time and in essence used computers as input-output devices. STEAMHAMLET lets its visitors reimagine everything about school as they indulge in an immersive experience that mimics their already-powerful human brains. Something like this has been hinted in a few fictional worlds from television and film, and its power is immediately felt by its users—Dreamscape, Star Trek, Inception, and Ender's Game, to name a few. The impact on school directly resulting from the use of STEAMHAMLET is completely unbound and unknown. Creating and learning in this space will encourage limitless growth and discourage oversimplified measurements of success.

Each day inside STEAMHAMLET changes not only its visitors but also the machine itself. The room learns as it receives input. Visitors can conduct full conversations with STEAMHAMLET as it is capable of processing and responding with culturally relevant objects to put on stage. These conversations further teach the cube space unique versions of culture as understood by the vision and ideas of one's mind. Only speaking a word or a phrase to recall

an object is far too blunt of a tool and highly inaccurate. STEAMHAMLET is more intriguing and of better service to humanity by engaging in trying to represent how people create quiet mental visions that would otherwise hardly ever make it to the physical world outside the mind.

**Actions for the Field**
Students need to own their work. Instead, they are handed a worksheet, a worksheet created by a company that owns the work. In this business transaction, we shortchange the student, and we lie to the family that learning has happened. Without experience, no learning can happen. They may be sitting on beanbags or at kidney-shaped tables instead of rows and columns, but don't be fooled: if students don't have agency or choice, they are passing time and (maybe) passing classes. So, where and when does learning take place? Come to STEAMHAMLET and find out. School will never be the same and that's why it needs a new name.

In the shared vignettes, the authors position AI technology as a tool of learning, and a tool for learning, analogous to the distinctions between educators also make between assessment *of* learning and assessment *for* learning (Aslan & Reigeluth, 2011; Papert, 1993; 1994 revised ed). In some cases, the students use the tools, while the tools are reporting on the student in other cases. One is the actor, one the recipient, but for different kinds of data and information. In both cases, the authors are envisioning hybrid systems, where humans, either students or teachers, are in the loop, meaning that actions and decisions are made at least in part on human feedback.

Adaptive technology, as a growing part of the curriculum, will continue to refine how it addresses the individual and local needs of students and educational systems (Xie et al., 2019). An important caveat of the current data is that much of the research has focused on Western, particularly US-centric, data and applications. Pinkwart (2016) predicted that before 2051 all students would have access to computer technologies, but he also argued that the software would not be adequate to address global needs. The changes required to cross-culturally validate an AI agent are myriad and extend beyond the simple translation of words. Content and cultural experts would need to examine the images, feedback text, and content topics for appropriateness to the setting. Again, this is a task that developers cannot undertake alone—it requires a community of effort.

## AI Ethical Processes

Developing complex technological tools such as wearable devices and AI applications is complex cognitive work. However, researchers and developers need to be aware of how these tools can enhance lives and overwhelm them. Norman, talking