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HETL Frontiers

The aim of the International Higher Education Teaching and Learning Association (referred to as HETL) is to bring together higher education professionals and thought leaders from around the world to dialogue, network, and collaborate on issues relevant to teaching and learning in higher education.

Web 4.0 – a new remodelling in education

Message from the President of the International Higher Education Teaching and Learning Association (HETL)

Dear HETL members and global education community,

The year 2023 has been a productive year for HETL. To support the global educational community, HETL continues to develop relevant projects and initiatives allied with the major concerns confronting educators around the world.

To further our mission, HETL continues to expand on several initiatives that were implemented last year, including:

● *HETL Talks* include webinars and podcasts. These outlets provide an opportunity for educational leaders, policymakers, researchers, and educators to discuss important issues confronting the educational community. These talks are available on our website and on our YouTube channel as well as posted to our LinkedIn group.

● *Learning Futures* newsletter. *Learning Futures* provides an outlet for sharing cutting-edge ideas on how education, learning, and knowledge can help transform the future of the planet.

In this issue of *Frontiers*, educators share their thoughts and practices on the impact of Web 4.0 on higher education. The contributing writers provide exemplars and thought-provoking commentary on how Web 4.0 and related issues are being implemented in higher education institutions and how educators can best respond to the changing technological landscape. We hope that the authors' contributions will help you think critically about how to respond to Web 4.0 at your own institutions and in your own classrooms.

The HETL 2023 Conference in Aberdeen, Scotland, was highly engaging with 275 participants from over 20 countries. The theme for the conference was: Re-imagining Education: Collaboration and Compassion. The proceedings of the conference can be downloaded from the HETL website.

Finally, HETL continues to connect the global education community through networking and collaboration. Fast-moving technological changes around the world remind us of the need to collaborate and communicate. HETL invites you to support our work by becoming a member at https://members.hetl.org/.

Regards,

Patrick Blessinger

Message from the Editor of HETL *Frontiers*

Dear HETL members and global education community,

We are proud to share the second edition of the HETL *Frontiers*. The HETL *Frontiers* magazine aims to present diverse perspectives and ideas on the emerging trends in higher education development, innovation, sustainability, and educational futures, across the core functions of higher education: teaching, research, and service. HETL *Frontiers* includes easy-to-read, high-quality academic essays from educational leaders and scholars worldwide, allowing institutional leaders, faculty, and others to stay updated on the most relevant issues impacting higher education.

This edition focuses on Web 4.0 – a new remodeling in education. Web 4.0 (the symbiotic web) is characterized as the Internet of Things, an electronic space where humans and machines will interact effortlessly through artificial intelligence (AI) and highly intelligent. This edition features essays from colleagues worldwide, including various HETL Country Directors (https://www.hetl.org/country-delegates/).

I want to express my most profound appreciation for the commitment of Patrick Blessinger for his continued unselfish leadership. He ensures that HETL presents information on various aspects of higher education and allows colleagues to share their work on multiple portals.

Thank you to the HETL Publicity and Promotions Committee, Sameera Saeed, Taisir Subhi Yamin, Rakel Kavena Shaleyefu and Mojca Kukanja Gabrijelčič for the dedication to ensuring that this second edition is published. The HETL *Frontiers* will be published twice a year, and a call for the next edition will be forwarded through the HETL communication channels.

We hope you will enjoy the reading and contribute to future editions.

Kind regards

Martina Jordaan

HETL *Frontiers* – Content

HETL *Frontiers* is published twice a year in English. You may circulate and reproduce as you see fit. Kindly cite the authors and refer to the International Higher Education Teaching and Learning Association. We are looking forward to receiving any suggestions, comments and new articles.

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1. Web 4.0 and game-based learning in postgraduate study: A Case of University of Greenwich, UK

by **Tendai Douglas Svotwa,** lecturer in Management, University of Greenwich, Greenwich Business School

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The Web has gone through a rapid metamorphosis in the past few decades. There have been noticeable transformations on the technological front since the inception of Web 1 in the 1990s to the current Web 4.0. In addition, the Web has necessitated the flow of goods and services seamlessly across borders in industry and commerce. It has also had far-reaching consequences on the social sphere and higher education institutions (HEIs). Web 4.0 is a relatively new phenomenon that has been defined from multiple angles without unanimity on its precise definition. However, for the purpose of this discussion, Web 4.0 encompasses the Internet of Things, and the interactions between humans and machines through intelligent learning systems that enable a synchronized communication infrastructure (Almeida, 2017).

The Case of the University of Greenwich, Greenwich Business School

In the domain of higher education, Web 4.0 is currently being utilized for postgraduate studies, as exemplified by the Master of Business Administration (MBA) International Business program at the University of Greenwich, United Kingdom, in one of the Strategy modules. The module has a component of a simulation game in strategy analysis. The online simulation game provides an excellent platform for students to collaborate and sharpen their analytical, cognitive, critical and problem-solving skills since they are organized in multiple groups and have to craft their strategies, compete with other teams and achieve a sustainable competitive advantage for their firm.

The modalities of the simulation game are such that students collaborate in groups, with a given start-up capital to capacitate and finance their operations. Fundamental and key decisions must be made by the team members who include: The Chief Executive Officer, Head of Finance, Head of Information Technology, Head of Marketing, Head of Human Resources and Head of Production. Furthermore, the executive team's initial task would be coming up with the firm's trading name, vision and mission statement. Based on the concept of strategy, commencing with the crafting of strategy right through strategy implementation and evaluation, the whole essence of the simulation game is about winning.

Students need to have a clear understanding of the competitive environment and be able to comprehend the use of SWOT analysis, PESTEL analysis, Porter's five forces model as well as the value chain. Critical strategic decisions should be made in terms of the markets to operate in (justified), the strategy that should be pursued, hiring of personnel, pricing of the product, segmenting the market as well as distributing the product. All these activities are enabled by Web 4.0 to ensure that the groups operate efficiently powered by information technology. The simulation game is played over six weeks, with each week representing a year of trading. Students submit their work every Monday at 5 pm and results would be available after 2 hours. Based on their performance, the groups are then ranked overall in the entire module. Rankings are provided for the groups by Web 4.0, thereafter, students will strategize going into the following week. New decisions will be made depending on the profitability and competitiveness of the firm.

In the second year of trading, students are given choices of penetrating into additional markets (countries), and such decisions must be justified. Related to that, key strategic decisions must be justified regarding product positioning, distribution decisions, pricing, segmentation, promotional activities, hiring decisions as well as financing decisions. For instance, the Head of Finance should make decisions related to capital budgeting, capital structure and working capital management. The simulation game is also a learning opportunity for students to manage their cash resources and be profitable. The game

progresses to the next week until the teams reach week six (equivalent to year six of trading). Thereafter, the winners of the simulation game will be crowned! Based on the foregoing, it is imperative that team members collectively make decisions regarding the attainment of the firm's vision.

Synthesizing the permeation of Web 4.0 in running the simulation game provides evidence that, indeed, technological advancements have capacitated and enabled the entire learning process for students at the postgraduate level. However, instructors must be mindful of the downsides of relying much on technology as students may overly rely on it, thus substituting the human element, hence negating some of the intended benefits in terms of knowledge acquisition. Another topical issue related to Web 4.0 includes the use of generative artificial intelligence, which may impair academic integrity; hence it needs serious consideration in the assessment of risk, especially at module level. Such concerns need to be dealt with, most importantly at the institutional and faculty level.

Conclusion

The current work typology demands collective and collaborative team effort in the diverse, evolving and dynamic operating environment. Surely, it would be suicidal for HEIs to turn a blind eye to Web 4.0 and its envisaged benefits for the growth and development of students. Particularly important is the link brought by Web 4.0 in the complementarity between the theoretical aspects advanced in lectures and tutorials as well as the application side, represented by the employment of simulation games that are practical and real. The days for HEIs to churn out theory-oriented graduates are over. Rather, they must embrace the application of the Web 4.0 to produce competent, capable, and knowledgeable graduates who are relevant to the job market and who can meaningfully create value in an economy. Value creation implies that graduates are not perceived as job seekers only; rather, they can be active actors in the economic ecosystem by creating employment opportunities for themselves and others, thus contributing to economic growth and development.

Reference

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2. AI-Powered Economics Education: Maximizing Learning Outcomes

by **Prof. Sonal Pandey**, Ph.D. Faculty, SEBS-Agricultural Econ & Mktg, Rutgers University-New Brunswick, New Jersey USA and Business and Computer Science, Middlesex College, Edison, New Jersey USA

Economics education has become increasingly important in today's world, as it provides students with the skills and knowledge necessary to navigate complex economic systems. However, traditional teaching methods may not be sufficient to fully engage students and enhance their learning outcomes. This is where artificial intelligence (AI) techniques come in.

Merging AI and Economics

AI in economics education can revolutionize the way students learn and understand economic principles. By using machine learning algorithms and other AI techniques, educators can create personalized learning experiences that cater to each student's unique needs and learning style.

This article explores the potential impact of AI on higher education. The article discusses how AI can enhance teaching and learning, streamline administrative tasks, assist with research efforts, and improve the overall student experience.

Through an analysis of current AI applications in higher education, we identify the benefits, limitations, and ethical considerations associated with using AI in enhancing learning outcomes in economics education. We also consider the implications for educators, students, and institutions as AI continues to evolve and shape the future of higher education. This paper aims to provide insight into the promising opportunities and challenges that AI presents for higher education and to encourage a thoughtful and informed discussion about its role in shaping the future of learning outcomes in economics education.

AI pedagogy

One important aspect of AI pedagogy is the emphasis on hands-on, experiential learning.

This can include:

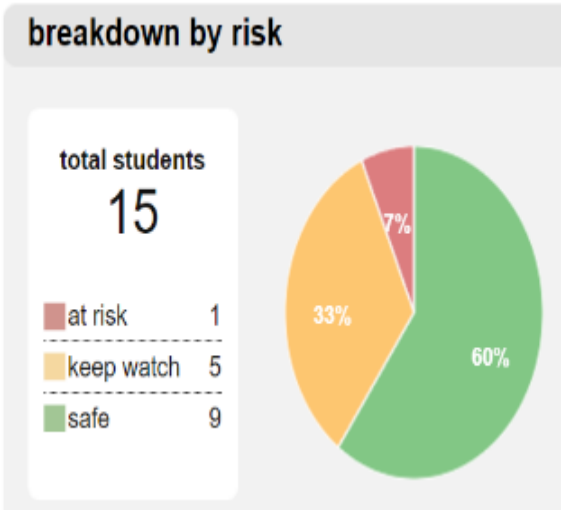
- Working on projects that apply AI techniques to real-world problems,
- Articipating in hackathons or coding competitions, and
- Engaging with open-source AI communities like connect space, nice job and Engagement HQ.

These activities not only help students learn technical skills but also foster creativity, critical thinking, and problem-solving skills essential for success in AI.

Personalized learning

AI can help to create customized learning plans and individualized programs to meet the unique needs of each student. It can analyze data on student performance, learning style, preferences, and interests to offer tailored recommendations. Some of the practical constraints notwithstanding, it is identified that personalized learning with other pedagogical models, such as mobile learning, ubiquitous learning, game-based learning, collaborative learning, etc., has a high potential to enhance the respective model by improving the learning progress and outcome of learners.

How AI and Data Could Personalize Economics Education



Students' performance on each chapter assignment and their time engaged in the chapter can be analyzed by educators to determine which topic or lesson is harder for them and what extra support they need. Educators can, however, identify students' learning abilities with data collection.

Personalized learning

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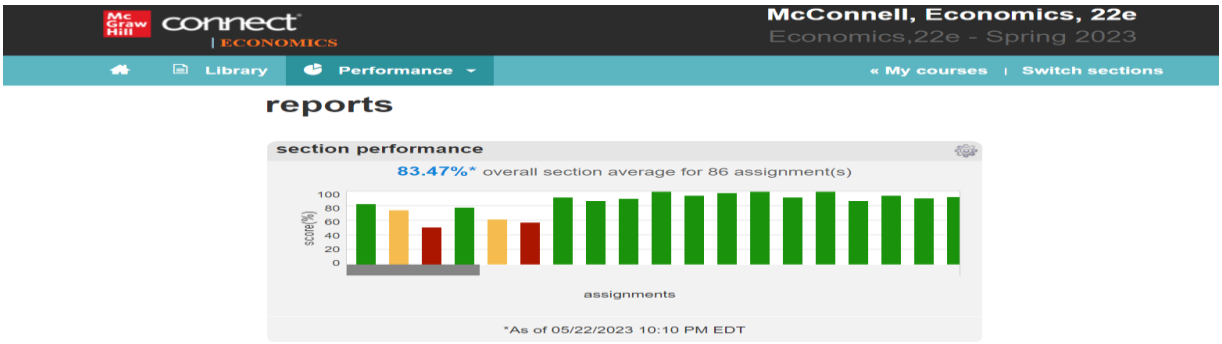
How AI and Data Could Personalize Economics Education

Students' performance on each chapter assignment and their time engaged in the chapter can be analyzed by educators to determine which topic or lesson is harder for them and what extra support they need.

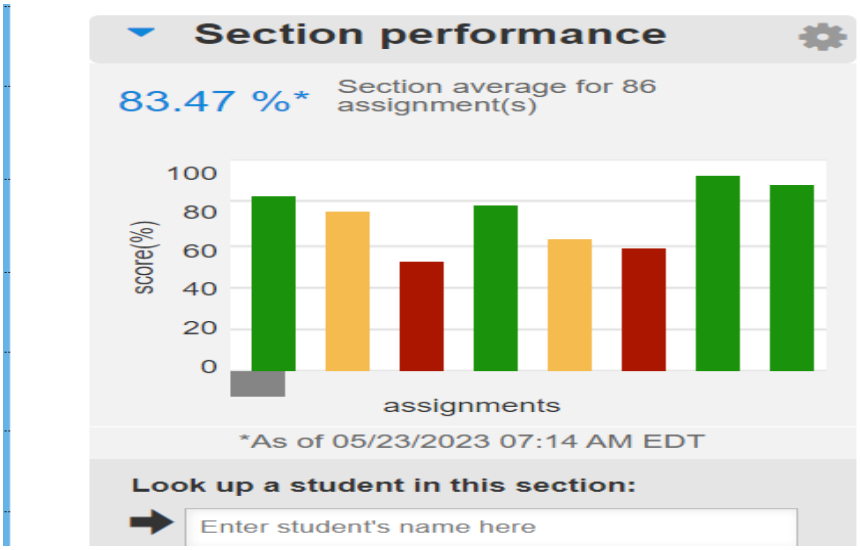
Educators can, however, identify students' learning abilities with data collection

Below is the screenshot of my course section performance report for 86 assignments.



Predictive analytics

With the collection of data now, we can easily predict the students' performance and how we can better assist them.



Predictive modeling to identify at-risk students based on academic performance and engagement metrics. Identifying students who are most likely to succeed and perform well in certain fields of study. Personalizing outreach and communication to students based on individualized data points, such as learning styles or challenges that might impede their success. Analyzing dropout rates and retention rates to address challenges and create strategies to reduce the attrition rates. Optimizing course schedules and class sizes based on course demand and enrollment trends.

AI enable Simulation

This is an example of production and cost analysis of economic courses where students can play a role and understand the topic with simulation. AI can enable students to stimulate complex economic scenarios and test different policy interventions. This can help students develop a deeper understanding of how economic systems work and the potential impact of different policy decisions.

Curriculum design

AI can help design economics curricula by identifying gaps in existing course materials and recommending new topics based on emerging trends in the field. This can help ensure that students are equipped with the most relevant knowledge and skills for the job market.

Benefits of AI in Economics Education

- AI algorithms can create customized lesson plans and activities that are tailored to their individual needs.
- With AI-powered assessment tools, students can receive immediate feedback on their progress and identify areas where they need to improve. This can help students stay motivated and engaged in the learning process.

Challenges of Implementing AI in Economics Education

- Lack of access to high-quality data.
- Need for specialized expertise.
- Lack of a team of experts with knowledge in both economics and computer science. This can be difficult to find, especially in smaller institutions or schools with limited resources.

Examples of AI Techniques in Economics Education

- The use of chatbots to provide personalized assistance to students. These chatbots use natural language processing (NLP) algorithms to understand student questions and provide relevant answers.
- The use of predictive analytics to identify at-risk students. By analyzing data on student performance and behavior, predictive analytics algorithms can identify students who may be struggling and provide targeted interventions to help them succeed.

Training Educators to Use AI in Economic Education

- Educators must understand how AI works and how to integrate it into their teaching practices.
- Institutions can provide professional development opportunities that focus on the use of AI in education.
- Educators can also collaborate with data scientists and developers to learn how to use AI tools effectively.

Transparency in AI Algorithms

- To ensure transparency, educators can work with developers and data scientists to create algorithms that are explainable.
- They can also use tools that allow them to visualize how AI is making decisions and recommendations.
- Educators can ensure that students understand how AI works and why it is making certain recommendations.

Ensuring Ethical Use of AI in Economic Education

- The algorithms used by AI should not perpetuate biases or discriminate against certain groups of people.
- To ensure the ethical use of AI, educators must first understand how AI works and what data it relies on.
- They must also be aware of the potential biases that can arise from the data used to train AI algorithms.
- Educators can then work with developers and data scientists to ensure that AI is trained on unbiased data and that its algorithms do not discriminate against any group of people.

Effectiveness of AI in Economic Education

AI should be used with other teaching methods to enhance student learning, like:

- Content Recommendation Systems
- Natural Language Processing
- Virtual Reality (VR) and Augmented Reality (AR)
- Data-Driven Instruction
- Intelligent Tutoring
- Adaptive Learning

Future Implications of AI in Economics Education

- The future implications of AI in economics education are vast and exciting. As AI technology continues to evolve, we can expect to see even more personalized and effective learning experiences for students.
- In addition, AI in economics education can democratize access to high-quality education. With online learning platforms powered by AI, students from all over the world can access the same high-quality education as those in top-tier institutions.

Conclusion

In conclusion, AI in economics education can revolutionize the way students learn and understand economic principles.

Overall, while the use of AI in economic education is still in its preliminary stages, there is growing interest in exploring the potential of these technologies to enhance teaching and learning in this field.

- "AI in education can only grow at the speed of trust." —Dr. Dale Allen
- Here, I would like to quote- "First and foremost, AI is getting deployed in educational contexts that are already fragmented and broken and unequal. Technology does not discriminate—we do. So, as we think about the application of these new systems, we must really think about the contextual application of AI." —Dr. Nicole Turner

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3. Unleashing Technology for Learner Empowerment and Agency

by **Serpil Meri-Yilan**, Assistant Professor of Foreign Languages, AICU, Turkey; Curriculum Designer of English, Groningen University, Netherlands; Country Director HETL

In the dynamic realm of a technologically advanced society, educators and institutions must delve deeper into exploring and integrating innovative technological tools into their teaching methodologies, adapting to the global and academic demands of the rapidly changing era. With the advancement of Web 4.0 technologies, these demands have levelled up and compelled course designers or facilitators to create learning settings where learners interact with machines. Above all, the facilitators ought to conscientiously take into account the multifaceted nature of learner diversity during the process of incorporating technologies into the instruction.

In foreign language education, the presence of cultural and linguistic disparities has primarily been seen as the diverse nature of learners (Mahinda, 2014). Furthermore, learners' socio-economic status significantly plays a vital role in foreign language learning (Bray et al., 2004), especially when utilizing web tools. Nevertheless, without regard to these disparities, technology-integrated learning settings ought to benefit all learners from web tools in the same way, for instance, to access an online material or play video games, and boost learning for all learners. Above all, the main purpose of these tools is to leverage self-management and self-regulation skills through the interaction between learners and online resources.

To address the issue of the role of web tools on learning, this paper first describes learner agency and learner empowerment in technology-assisted learning environments. Then, it moves to the design of a blended learning environment from my experience as a lecturer.

Learner Agency

Learner agency plays a crucial role in foreign language learning, particularly when utilizing web tools in a blended learning environment. Blended learning combines traditional face-to-face instruction with online resources and platforms, providing learners with more autonomy and control over their language learning journey. With web tools, learners have the opportunity to engage in self-directed learning, accessing a wealth of online materials, language learning apps, and interactive platforms. Learner agency in blended learning enables learners to personalize their language learning experience, select resources that align with their interests and needs, and actively participate in online communities for language practice and cultural exchange. By fostering learner agency, blended learning with web tools promotes autonomy, motivation, and the development of important digital and language learning skills, ultimately enhancing the overall foreign language acquisition process.

Learner Empowerment

Learner empowerment can be seen related to learner agency. In fact, the increased agency empowers learners to take ownership of their learning, set their own goals, and make choices regarding the pace and content they engage with. Above all, empowerment is closely intertwined with motivation, encompassing various processes that enhance personal initiative, task persistence, and self-efficacy. The four primary dimensions of empowerment, including meaningfulness, competence, impact, and choice are seen to align with the basic human needs of autonomy (Brooks & Young, 2011). For instance, choice and meaningfulness address to self-determination and self-beliefs and values respectively, while competence and impact refer to confidence and influence respectively. These dimensions serve as intrinsic reinforcements during foreign language learning activities. By leveraging web tools in language education, learners can experience enhanced empowerment through access to resources, personalized learning experiences, interaction and collaboration opportunities, self-assessment and progress

monitoring, and the flexibility to learn at their own pace. These tools empower learners to take ownership of their language learning, make informed choices, and actively engage in the learning process.

Designing a Blended Learning Environment

A blended learning environment was designed for courses in Speaking, Listening, Reading and Grammar in an English foundation program, part of a state university located in one of the least developed cities in eastern Turkey. Furthermore, as the university was established after the education reforms of 2008, it had some potential lacks of technological devices and environment. The other shortcoming was the low socio-economic status of the students who entered the university. Therefore, the design considered a learning setting where each student could equally access and interact with the tools.

To begin with, as a lecturer, I set up a language lab and self-access learning center at the university and integrated technology into my teaching. To enable online interaction, I created classes in Google Classroom (as the University does not have a proper LMS to interact with students). I gave assignments through Google Classroom, and they submitted their work via it. For my Speaking class, I used a method of digital storytelling and incorporated task-based learning into digital storytelling as a next step. For the Listening class, I chose multiple files with diverse accents, for instance, songs, news etc. For the Grammar class, I created online games in Kahoot!, by which they could enjoy while learning. For the Reading class, students created short and long reading paragraphs with five related questions and posted them on Google Classroom.

As they first encountered this kind of online task activities, they looked shy and unconfident at first. Therefore, the initial focus was to make them engage with their peers. Moving forward, online activities such as creating own reading passages or digital videos, posting and sharing them online, receiving feedback from their peers and giving feedback to their peers' posts helped them evaluate themselves and regulate their learning. This was also noted in their further online assignment submissions such as creating longer videos without pauses, choosing their own topic for the passages, filling out self-reflection rubrics to grade their own writing and speaking skills, finding alternative podcasts to listen and making their own online games for grammar activities. All in all, integrating technology into educational practices can be a transformative approach to foster learner agency and empowerment.

Conclusion

Despite multiple studies, the way to overcome challenges in low socio-economic status arenas has been missed. By leveraging technology in a tailor-made manner, educators can create personalized learning experiences that cater to the individual needs and preferences of learners. This approach ensures that instructional materials, activities, and assessments are carefully designed and customized to meet the specific requirements of each learner. The use of technology in a tailor-made fashion promotes engagement, autonomy, and achievement, ultimately enhancing the overall effectiveness of the learning process.

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4. Understanding the contribution of Higher Educational Institutions towards emerging literacies for a sustainable future

*by **Prof** **Anushka Lydia Issac***, Faculty and Course Leader - L3 Pearson Foundation Program Westford University College, Sharjah, United Arab Emirates

Introduction

In today's rapidly changing world, traditional literacy is no longer sufficient to navigate the complexities of the 21st century. Emerging literacies encompass a range of skills and competencies that are essential for individuals to thrive and contribute to a sustainable future. These literacies include digital literacy, information literacy, cultural literacy, and environmental literacy, among others. Higher Educational Institutions (HEIs) have a crucial role to play in cultivating these emerging literacies among their students.

The Role of Emerging Literacies towards Sustainable Development

The concept of sustainable development is one that is continually changing and has the power to influence organizations and society at large that are concerned with balancing the social, economic, and environmental aspects of development (Chaka, 2022). Educators, policymakers, and researchers have recognized the importance of integrating these emerging literacies into educational systems and curricula, as they are essential for learners to develop the knowledge, skills, and attitudes needed to address complex societal challenges such as climate change, poverty, and social inequality (SDG 4, SDG 13, SDG 1, SDG 10).

Emerging literacies are closely linked to sustainable development. As global challenges such as climate change, social inequality, and technological disruptions continue to shape our society, individuals need to possess the knowledge and skills to address these issues effectively. For instance, environmental literacy equips individuals with an understanding of ecological systems and the impact of human activities on the environment, fostering responsible decision-making and sustainability practices (SDG 13). Digital literacy enables individuals to critically engage with technology, promoting ethical and inclusive use of digital tools (SDG 4). Additionally, cultural literacy promotes respect for diversity, inclusion, and social cohesion, contributing to reduced inequalities within societies and fostering peaceful and inclusive communities (SDG 10) (Findler et al., 2019).

Viewing the UAE as an Emerging Economy for Education

The United Arab Emirates (UAE) serves as an excellent example of an emerging economy that recognizes the importance of education and the cultivation of emerging literacies. The UAE has indeed demonstrated a strong commitment to education and the cultivation of emerging literacies.

The Mohammed Bin Rashid School of Government in Dubai, for instance, focuses on public policy, governance, and administration, incorporating emerging literacies like data analytics and digital governance (MBRSG, 2021). The UAE University's Sustainability Science Program, another example, integrates sustainability and emerging technologies, promoting interdisciplinary coursework and a holistic understanding of emerging literacies (United Arab Emirates University, 2022). The UAE is actively promoting the integration of these literacies in its higher education system, ensuring graduates are well-prepared to contribute to the nation's sustainable development.

Integrating Web 4.0 Technologies for the Implementation of Emerging Literacies

The concept of literacy has evolved over the years, and with the advent of technology and the need for sustainable development, new forms of literacy are emerging. Education 4.0 is viewed as a disruptive educational innovation that has the potential to unbundle the higher education system in favour of offers that are repackaged, individualized, and peer-to-peer. Web 4.0 technologies, such as the Internet of Things (IoT), artificial intelligence (AI), big data, and cloud computing, offer immense opportunities for the implementation of emerging literacies in HEIs. These technologies enable interactive and personalized learning experiences, facilitate access to vast amounts of information, and foster collaboration and global connectivity (Berchin, de Aguiar Dutra and Guerra, 2021). For instance, AI-powered adaptive learning platforms can cater to individual student needs, promoting personalized learning experiences and fostering digital and information literacy.

Challenges and Considerations

Despite the numerous benefits, the integration of Web 4.0 technologies and the cultivation of emerging literacies in HEIs come with challenges and considerations. Access and equity remain critical concerns, as not all students have equal access to technology or the necessary digital skills (Sterling, Selby and Sterling, 2010). It is essential for HEIs to bridge the digital divide and provide support for students from diverse backgrounds. HEIs should foster a critical understanding of these issues to ensure responsible and ethical use of Web 4.0 technologies.

Conclusion

HEIs play a vital role in cultivating emerging literacies for a sustainable future. By integrating Web 4.0 technologies into their teaching and learning practices, HEIs equip students and educators with the skills and knowledge necessary to address the

challenges of the 21st century. However, it is crucial to consider issues of accessibility, equity, and ethics to ensure that the benefits of these technologies are realized by all. Therefore, it is crucial that educators and policymakers prioritize the integration of emerging literacies into educational systems and curricula. This can be achieved through ongoing teacher training, the development of digital resources, and the incorporation of emerging literacies into the curriculum. Through their commitment to developing emerging literacies, HEIs contribute to a more sustainable and inclusive future. By doing so, we can create a more sustainable and equitable future for all.

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5. Web 4.0, ChatGPT, and the Future of Higher Education: Initial Discussions Towards a Roadmap for a Digital Transformation

by **Ahmad Samarji,** Visiting Scholar, University of Wollongong in Dubai, UAE

Introduction

Over the past three decades, we have progressed from one web technology generation to another. Anecdotally, Web 1.0 was termed after the emergence of Web 2.0 as the world came to realize that we have started progressing in an ongoing—and most probably never-ending— sequence of web generations. Such generations can be distinguished from one another by several attributes, such as features, access, interactivity and engagement levels, focus, web language, and advertising, to name a few!

Web 1.0 marked the era of the read-only web and was characterized by the features of web browsing, basic search for information, and basic communication avenues, including emails, chat rooms, and instant messaging programs. In my

memory—as I was a lucky Web 1.0 user as a teenager—Web 1.0 is strongly associated with Encyclopedia Britannica, MSN Messenger, and Netscape Navigator.

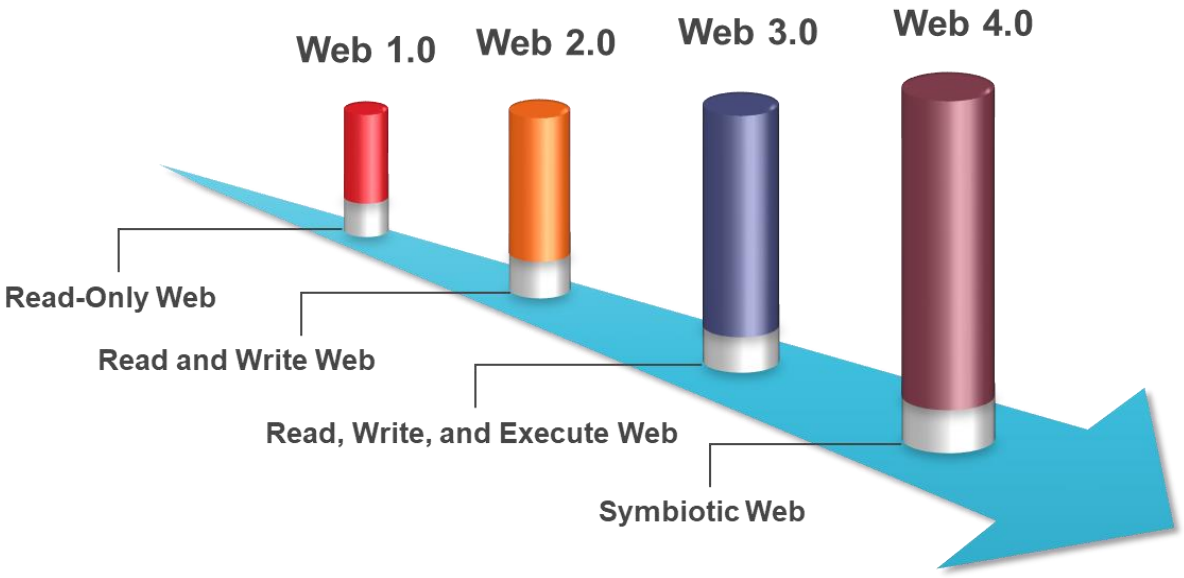
Web 2.0 was marked by the "read and write" feature, allowing for user-generated content and a wider engagement of society and industries, including the higher education industry. It was hallmarked by establishing the open-content online encyclopedia, where Wikipedia allowed content to be added and updated through the collaborative effort of a community of users. Web 2.0 enjoyed the emergence of social media platforms, mainly Facebook and Twitter. This prompted a number of scholars to refer to it as the "participative social web".

Web 3.0 is the semantic web, making more logical connections and offering more decentralized online and virtual experiences. Progressing from the "read-only" Web 1.0 to the "Read and Write" Web 2.0, Web 3.0 can be confidently characterized as the "Read, Write, and Execute" web technology, incorporating AI and machine learning across platforms, apps, and its various web experiences. The social media platforms have expanded in numbers and features and have been substantially integrated into the operations, communication, and marketing strategies and approaches of all industries, including the higher education industry.

Regardless of whether or not—as yet—, we are at the early stages of Web 4.0, the emergence of artificial intelligence (AI) chatbots (e.g., ChatGPT) has prompted conversations and discussions about Web 4.0 and the future of web technologies. Web 4.0 can be described as the "Symbiotic Web" that will offer an individualized augmented reality experience and will further utilize and integrate AI and machine learning technologies in shaping and defining such a reality. The figure below (Figure 1) models the progression—so far—across the four generations of web technologies.

Figure 1

Development of Web Technologies



Impact of Web Generations on Teaching and Learning in Tertiary Education

Web 1.0 provided a unique opportunity for tertiary students and instructors to communicate over email correspondence and browse for information online, despite the limited available content online, at the time. The "read and write" features of Web 2.0 aligned with the active engagement of students and provided more student-centered online experiences. Additionally, digital libraries, digital content, databases, and e-books became more available, supporting research and research inquiries. During this period, two American scholars, Matthew Koehler and Punya Mishra, rethought Shulman's PCK model by integrating "technology" as an additional element to the model to become TPCK in 2005 and then to be renamed TPACK. The TPACK model and its knowledge constructs denoted an official connotation that technology was no longer the "ad hoc" or "à la carte" tool that can be selectively invited into our classrooms but has become an integral component of our teaching and learning practices at schools and universities.

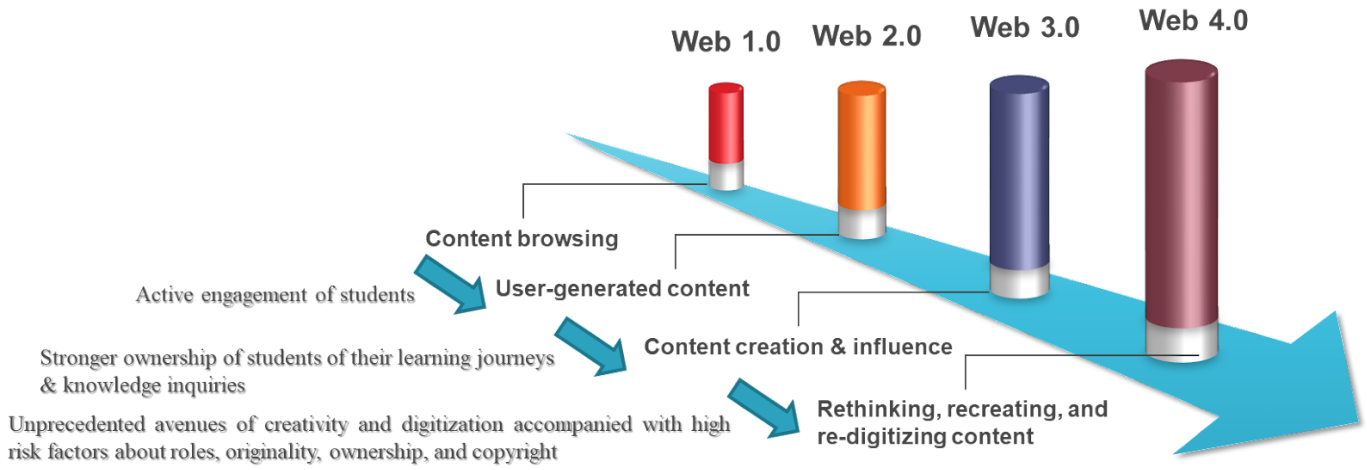
Web 3.0 denoted the migration of many of our teaching and learning practices to online, virtual, and cloud-based settings. The availability of general and specialized content through research databases, repositories, advanced search engines, and

published videos has shifted the focus of the universities from providing students with knowledge and skills to equipping students to become lifelong learners capable of updating and advancing their knowledge and skills. Additionally, Web 3.0 technologies have enabled students to have more ownership of their learning journeys and be more autonomous and creative in utilizing such technologies.

As we transition from Web 3.0 to Web 4.0 and with more students, as well as instructors, relying on ChatGPT and other AI chatbots in carrying out their work, a number of opportunities accompanied by several risks and challenges have arisen. The risks and challenges are mainly focused on authenticity and originality, ownership and ethical considerations, and "roles", or perhaps the "change of roles". The figure below (Figure 2) models how the transition from one web generation to the other has aligned with teaching and learning experiences at universities.

Figure 2

The Educational Impact of the Transition from One Web Generation to the Other



The challenge of authenticity and originality is an alarming one in tertiary education. This challenge goes beyond our common perception and understanding of plagiarism to address a new question about how we can handle cases where students have written and properly paraphrased ideas that were not generated by them but by ChatGPT or its siblings and submitted the work as their own. The challenge here is that the thinking process was done by a machine, and the students merely paraphrased the work in a manner that would pass any originality test. This actually risks one of our core educational missions, which is to nurture students' critical and analytical thinking and reflection capabilities as they produce an assignment or complete a task. This challenge leads to the second one, about ownership and ethical considerations. How ethical would it be for us to assess a piece of work for a student, where the bulk work has been completed by AI and not their own "intelligence"? Would a student be able to claim ownership of work for which they have exerted minimal intellectual effort?

The growing reliance on AI and the advanced features that AI applications provide in executing nearly all the tasks that they are prompted to do raises a serious question about "roles". As we fully transition to Web 4.0, will our roles as instructors be the same? Will our expectations of the role of our students still be the same? Is there a new role for a virtual assistant or peer that we need to acknowledge and properly integrate into our teaching and learning and assessment practices? How will the emerging virtual and augmented reality shape our course learning outcomes (CLOs) and program learning outcomes (PLOs)? These questions urge us to start seriously thinking about the potential change in "roles" at our higher education institutions and the ramifications of such a change.

Addressing the Challenges

With the growing "artificial" intelligence, we, as educators, definitely need to strive to ensure that the avenues for "human" intelligence grow—at least— in a proportional manner. We have to make sure that our students' critical and analytical thinking capabilities are nurtured during their academic journeys. We should exert all the effort required to stress the conceptual understanding (know-why) that our students need on top of their acquisition of procedural knowledge (know-how). It is about time to revisit our rubrics and assessment practices to cover the component of authenticity and ownership. We need to work together to create a repertoire of strategies and intervention techniques to assess not only the work presented but also the thinking, or human intelligence, behind it, posing questions that prompt our students to answer the "so what" question behind their submitted work and be able to critically reflect on the work. Whether such an intervention needs to be done through

one-on-one meetings, classroom presentations and discussions, or any other method, we need to start it and reflect on how efficient it is in ensuring that we are meeting our CLOs and PLOs. The challenge of "roles" or "changing roles" is a huge one, and we have to start thinking, rethinking, and reimaging our practices in light of the new AI reality and any upcoming realities.

Time to be Proactive

The rapid and revolutionary changes that are associated with Web 4.0 prompt us to be very proactive in order not to jeopardize our mission when it comes to our students; their learning journeys; and the knowledge, skills, experiences, and capabilities they require to thrive in a changing and challenging world and market. It is about time to act; we need to start discussing, researching, and reflecting on our teaching and learning and assessment practices in light of the new reality. By doing so, we ensure that we remain the "avante-gardes" in any paradigm shift in education and higher education, cherishingthe advancement and the opportunities that web technologies will bring about whilst not risking the future of our students nor jeopardizing our commitment towards them and the community.

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6. Artificial Intelligence (AI) and Academic Integrity: Mitigating the Risks and Fostering the Ethical Integration of AI with Inclusive Assessment Design

by **Loretta Goff, PhD,** Academic Integrity Education Officer, University College Cork, Ireland

and **Tadhg Dennehy,** PhD Candidate and Research Support Officer for (AI)^{2}ed Project, University College Cork, Ireland

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Artificial intelligence (AI) tools have already become part of our lives, including predictive text, machine translation, live closed captioning, and spelling and grammar checkers. However, new developments in generative AI, including Open AI's ChatGPT and Google's Bard, along with other tools that can write longer form content, code, create images and music, or solve math equations with a few user prompts, have initiated substantial discussion across higher education about the future of assessment. These debates range from the belief that there will be no impact (ignore or ban AI tools) to the suggestion that assessment needs to be completely re-evaluated (end of the essay).

Advancements in AI will have a significant impact on both education and the workforce in years to come. Therefore, we cannot ignore it and need to evaluate the possibilities of its use in relation to teaching, learning and assessment. This means finding a middle ground in the debates and considering how generative AI can be used as an assistive tool – for example, as a starting point for inquiry, to brainstorm, outline, or create study cards – without losing out on intended learning. While AI does pose a threat to academic integrity when used to bypass learning in the case of "unauthorized content generation" (Foltynek et. al., 2023), it can also be used ethically to enhance the learning process.

Academic Integrity

Academic integrity is underpinned by six fundamental values: "honesty, trust, fairness, respect, responsibility, and courage" (ICAI, 2021). Fostering academic integrity and separating this from its counterpart, academic misconduct, which is often positioned as the primary focus, offers key motivating factors for student engagement (focusing on positive actions). Emphasizing academic integrity in a developmental, educational approach brings attention to the process of learning, the value in developing your skills, and the importance of being able to stand over your own work and take pride in it.

The European Network for Academic Integrity recommends that staff and students be guided on the benefits and limitations of AI tools and that students be provided the opportunity to develop the skills required to work with increasingly ubiquitous AI technology in an ethical way (Foltynek et. al., 2023). One way to achieve this is to introduce emerging technologies, including AI, into student learning alongside the principles of academic integrity. When this is done, students will be more likely to associate the use of these with good practice.

When introducing generative AI within the context of academic integrity, several key points are necessarily addressed before potential use, including:

- Guidelines: To ensure **fairness** (at the classroom, programme, discipline, and/or university level), clear guidelines for how and when AI technology can and cannot be used (for both students and staff) should be available and applied consistently.
- Transparency: To maintain **honesty** about what is your own work and what is not, any use of AI should be acknowledged, whether this is in the form of a specific reference for quoted material or a general statement of use (i.e., noting that a particular tool, such as ChatGPT, was used to help structure a document).
- Critical analysis: Understanding that you have **responsibility** for the work you produce encourages analyzing all AI generated content to ensure that it is accurate and unbiased. This is one of several ways AI and human-generated content differ; AI cannot take responsibility for what it produces. Critically engaging with AI tools, rather than accepting all content produced by them as accurate encourages learning and ensures that others can place their **trust** in your work.

The first step towards responsible integration of new tools like generative AI in higher education is to clearly align their use with the principles of academic integrity both in discussion and in policy. This forms an ethical foundation and helps establish a shared understanding and expectation across all stakeholders in the university. This foundation can then be built upon with specific guidance as related to the contexts of disciplines or particular assessment tasks.

Students-as-Partners and Inclusive Assessment

The principles of academic integrity encourage students to take an active role in their learning and this can be further supported through their inclusion as partners in assessment design and/or by allowing for a degree of choice regarding assessment tasks or how they approach these, while still providing clear guidelines and expectations. While this will not eliminate instances of misconduct, this element of agency does act as another mitigating factor against unethical use of generative AI by encouraging students to feel a deeper connection to their assessment tasks and to understand the value of these in their educational journey. It simultaneously promotes inclusion, widening opportunities for students to demonstrate their learning.

Authentic assessment (related to both professional competencies and individual student experience/values), programmatic assessment, and distinctive assessment (more open-ended, allowing for a diversity of engagement/output) all feed into assessment for inclusion (Tai et. al., 2023). These practices also present an opportunity for the ethical integration of generative AI in higher education, recognizing that AI tools are increasingly being used in the workplace and allowing for aspects of assessment to evaluate students' development with and without the use of these in a transparent and fair way. Introducing generative AI into learning and teaching practices in a careful, considered way means that we can ensure that students are well-informed and develop critical digital and information literacies, while still measuring their core skill development (independent of these tools) against crucial course/programme learning outcomes.

Case Study: $(AI)^2$ed Project

$(AI)^2$ed: Academic Integrity & Artificial Intelligence is a research project currently being conducted through the University College Cork Skills Centre. A key goal of this project is to develop a set of recommendations, in the form of a toolkit, that will provide guidance for staff and students regarding the ethical integration of AI technologies in their teaching and learning. This toolkit will include discipline specific examples of good practice around ways in which AI can be utilized to enhance pedagogical methods, allowing for a digitally enhanced teaching and learning space across a variety of academic disciplines.

As stated previously, the principles of academic integrity encourage students to take an active role in their learning. To this end,

the (AI)^{2}ed project is adapting a students-as-partners approach, whereby student participants are paired with an academic staff member from a relevant discipline. These pairings will work together to re-imagine assessment in the face of ever advancing AI technologies, highlighting both the need to mitigate against the unethical use of AI, and to uncover innovative ways to integrate it into assessment design and execution, while keeping intended learning outcomes to the forefront.

It is vital that, as we embrace and engage with emerging technologies, we maintain and emphasize principles of academic integrity, using AI as a complementary tool to promote diverse perspectives, learning styles, and accessibility.

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7. Are Students Ready for the Web 4.0? Reflections from the Remote Classrooms

by **Dr Hari C. Kamali**, Associate Professor of English Education, Far Western University, Nepal

The Context

It would have been much better had I not proposed this topic—I realize the complexities of writing on the topic without having sufficient technical knowledge. However, I could not cancel this project, so I kept on postponing it! But how long? Finally, the deadline knocked me off! Yes, neither could I go away from my everyday activity—the Web has been a part of our life! Thus, along with everyday personal and professional experiences of the Web application, I started exploring its comforts and complexities which got changed over time—this is perhaps called Web development!

Going through the developmental history of the Web application, scientists talk of different stages like the Web 1.0, 2.0 and the like. In the development and application of the Web each new stage is identified with its new advanced feature which has highly facilitated our personal as well as professional practices. Although I have this realization at the personal level, I do not find it so professional because as a teacher my professional practices are also influenced by other factors. When it comes to the students, I find them not proceeding with the development of the Web application—they are lacking behind the development of the Web! This aspect of my professional practice has intrigued me for the last few years.

Three Phages of My Reflections Vis-à-vis Development in the Web Applications

I have realized the increasing use of the Web in my institutions for the last few years. I can simply divide this period as pre-Pandemic, Pandemic and post-Pandemic. Although all these phages fall under the Web 4.0 in the period of the Web development which goes around the second decade of the twenty-first century, these phages have their own fluctuating characteristics. For example, the pre-Pandemic phase is mostly similar to the Web 1.0 as I found my students at the early stage of the Web application—they simply use the Web as a source of materials to read as they were hardly involved in the Web-based interactive practices. But during the Pandemic phase, the use of the Web increased so rapidly that it progressed from 1.0 to 2.0 and then to 3.0, and then possibly to 4.0 as the pedagogic practices heavily exploited the Web application. By hook or by crook students had to practice the Web application in a more interactive way and they were able to do it to a greater extent!

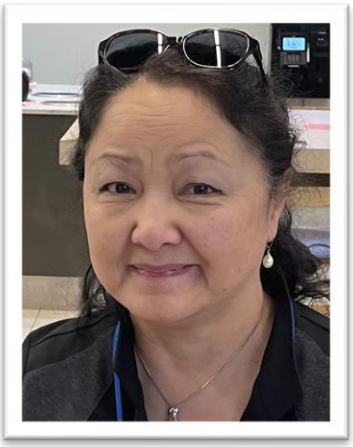
But, to my surprise, the post-Pandemic phase is so dwindling that their practice of the Web application retracted to 2.0 and 1.0! This might be surprising, but the fact is that when students were assigned tasks from the online resources, they hardly appeared with the assignments completed! This continued for the last two semesters and seems to continue further! That is why, I have called my reflections the reflections from the remote classrooms!

Conclusion

There are hardly few students prepared for the Web 4.0 application as most of them are still applying the Web for reading resources and personal networking, i. e. they are merely at the level of the Web 3.0 with regard to the application of the Web for personal purpose, and they are mostly at the level of 2.0 for the pedagogical purpose. Thus, I realize, the Web, as a technology, develops fast in a short period, but it takes time for students to develop the habit and skills of practicing the Web in life for autonomous, proactive, collaborative, and content-generating purposes as claimed by the application of the Web 4.0.

8. Higher Education Initiative for Sustainability in Mountain Areas and the Fourth Industrial Revolution

by **Dr Baktybek Abdrisaev**, Lecturer, History and Political Science, Utah Valley University



and **Dr Cholpon Akmatalieva**, Adjunct faculty, History and Political Science, Utah Valley University

When the World Economic Forum identified skills important for high-quality learning in the Fourth Industrial Revolution - "Education 4.0," it included, but not limited to experiences such as: Global citizenship; Innovation and creativity; Technology; Interpersonal skills; Personalized and self-paced learning; Accessible and inclusive learning; Problem-based and collaborative learning; and Lifelong and student-driven learning.

Since 2011, an inclusive co-curricular Student Engaged Learning (SEL) initiative encourages students at Utah Valley University (UVU) to gain certain skills, allowing them to contribute to the implementation of the Sustainable Mountain Development (SMD) within the 2030 Agenda for Sustainable Development (ASD). It also provided students with technology skills important for the implications of Internet of Things (IOT) for SMD advocacy in the State of Utah and globally. The SEL encourages students to jointly solve real-world problems, with faculty serving as mentors.

In this paper, we analyze further how structure and functioning of the developed SEL initiative to advocate for SMD allows students to gain learning experiences important for "Education 4.0."

In this essay, we also explore the abilities of students to use technological skills to share with their peers from the Osh Technological University (OshTU) in the Kyrgyz Republic experiences of SMD advocacy, by observing the United Nations (UN) International Mountain Days (IMDs) in addition to creating/expanding similar SEL initiative.

Educational Initiative Satisfies "Education 4.0" Requirements

Most mountain developing countries worldwide lag in economic development, exacerbated by harsh natural conditions, and challenges from climate change. Therefore, the initiative raises UVU students' awareness of the global world by SMD advocacy in the mountainous State of Utah and the mountainous Kyrgyz Republic. It contributes to the existing 2006 partnership between UVU and academic institutions from this developing country. Students advocate for SMD under the auspice of the UN-affiliated Mountain Partnership (MP), which coordinates SMD globally.

Students share with MP members, including their OshTU peers, best practices, and discuss challenges in building in Utah one of the most effective economies in the USA and the contribution of UVU to it. This will help them develop interpersonal skills. Problem-based and collaborative learning is provided through the Utah International Mountain Forum (UIMF), a coalition of student clubs at UVU. It implements SMD activities, which usually last longer than regular semesters and cannot be accomplished through academic programs. Curricular programs provide students with theoretical knowledge about SMD agenda and integrate club activities through SEL-based class assignments. In addition, they allow recruiting interested students in UIMF.

Students develop innovation and creativity by selecting assignments from a task list based on their own interests, and reporting during weekly club meetings, in presence of mentors, about contributions of skills, knowledge and practical efforts to their implementations. As per a requirement for clubs to self-fund activities, students learn to solicit funds through SMD advocacy. They also learn how to report to MP about project implementation and gain recognition from it.

Inclusive learning is facilitated through the involvement in activities of both traditional and non-traditional students. Traditional students are full-time learners, who attend higher education immediately after secondary school, with financial support provided for the most part by their parents. Non-traditional students are older than 25 years of age and must find ways to balance education with family and work responsibilities.

Non-traditional students, due to social, financial, and educational barriers, usually avoid joining clubs. To incentivize them to join, and as a matter of development interpersonal skills, the initiative provided non-traditional students personalized and self-paced learning, through the flexibility of schedules of activities, matching them with their interests, and integrating their experiences, among others. Based on interests, they could join any club of the UIMF or create their own within the coalition.

As a result, non-traditional students can contribute lifelong and student-driven learning skills. Due to their maturity, responsibility, and possession of experiences as local communities' representatives, they can initiate projects, affiliated to the community's needs and then lead and implement them. Most UIMF projects were initiated mainly by non-traditional learners. Faculty, as mentors, assisted them to tie their interests/activities to the MP requirements only.

As per Janes T. and others (2023), the use of technology is required to maintain not only the effectiveness of the initiative but also its ability to develop student interpersonal skills. This goal was achieved using simple IOT tools, for example, during joint virtual observations of the UN IMDs by UIMF and their OshTU peers.

Thus, the initiative implements target 4.7 of the ASD which ensures that all learners will acquire the knowledge and skills needed to promote SD, including through education for SD and satisfies "Education 4.0." requirements.

IOT Allows to Advocate for SMD and Share the Initiative

Joint IMD observations 2021 and 2022 required UIMF and OshTU students to hold weekly virtual sessions. While the use of zoom communication ensured a virtual group environment for IMD preparations, it also allowed faculty and students at OshTU to gain skills for SEL initiative implementation. Currently, they are creating their own clubs as UIMF partners.

MP Annual Reports 2021 and 2022 highlighted joint SMD advocacy by UIMF and OshTU students not only through the virtual IMDs observations but also during the 66th session of the Commission on the Status of Women.

The initiative was also featured by the UN Secretary Generals triennial Reports on SMD in 2016, 2019 and 2022.

Conclusion

The developed initiative allows all learners to become full-fledged contributors to the ASD and satisfy high-quality learning requirements in the Fourth Industrial Revolution. Due to its simplicity, it can be implemented by any interested academic institution worldwide.

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9. Accelerating the 2030 Agenda through Inclusive Citizen Science

by **Dr Patrick Blessinger**, St. John's University, USA; Executive Director, HETL Association, USA, and

Prof Abhilasha Singh, Provost/Vice President of Academic Affairs at the American University in the Emirates, Dubai, UAE

The COVID-19 global pandemic concretely illustrates how interconnected and interdependent the world has become. The COVID-19 pandemic illustrates, in stark terms, how events that occur in one part of the world, no matter how remote, can have an immediate impact on other parts of the world. This is not only true epidemiologically but it is also true politically, economically, socially, technologically, and environmentally.

What started out as an epidemic very quickly morphed into a pandemic, requiring the world to impose unprecedented restrictions on human travel and social contact, in order to save millions of lives and to "flatten the curve". The global lockdown shut down a large part of the global economy, resulting in a drastic reduction of economic output which resulted in reduced consumer spending, increased business closures, major disruptions in supply chains, and, ultimately, very high unemployment.

One of the interesting consequences of the global lockdown is that because people were required to stay home and/or practice social distancing, it increased the number of people participating in activities such as citizen science (CS) research projects. For instance, CS played an important role in COVID-19 research by crowdsourcing the collection of large amounts of research data. This data helped researchers better understand the dynamics of the disease and how best to combat it.

For example, researchers at Carnegie Mellon University used CS together with an AI-based platform to help predict the spread of the COVID-19 virus. This project illustrates how allowing people to participate in science projects that are meaningful to their lives not only helps to serve the public interest but also gives people a sense of purpose and community. For COVID-19, CS has been used for contact tracing, genomic analysis, and vaccine monitoring, among other projects.

Citizen science: an inclusive public practice

CS is the act of citizens (that is, the public) voluntarily collaborating with professional scientists to conduct scientific research. Nonexpert citizen scientists may participate in any of the phases of the scientific process (that is, project design, experimentation, data collection, data analysis, and problem solving) to address real-world problems such as sustainability issues.

A meta-analysis of the academic literature shows that most CS projects focus on three broad categories of research, 1) biology, conservation, and ecology, 2) geographic information, and 3) social sciences, public health, and epidemiology, with the largest body of research found in category one. In the first category, example projects might include projects involving biodiversity, wildlife conservation, air and water quality, climate change, urban ecology, and ocean and marine ecosystems, among others.

CS participants can include anyone, regardless of their age, socio-economic status, educational attainment, or interests, thus making CS a highly inclusive practice. In short, science is, and should be, for everyone, regardless of one's knowledge level of science. Because science can be applied to many issues, there are many ways for people to get involved in helping professional scientists conduct science to solve real-world problems.

For example, citizen scientists have participated in the following activities, monitoring air quality, classifying galaxies from digital images, locating and collecting dinosaur fossils, collecting images of whales, collecting audio recordings of bats, recording pollinator activity in gardens, and recording bird visits to feeders. Of course, the quality of the data collected by citizen scientists is a top concern so quality assurance measures must be part of the process to ensure high quality data.

Citizen science serves the public because it results in a number of social and individual benefits at multiple levels. Some of these benefits include, fostering public engagement, improving the democratization of science, improving scientific literacy and understanding of indigenous knowledge, increasing social and cultural capital, accelerating research, and broadening the scope and spatial coverage of research projects. Thus, CS can serve as an effective vehicle for accelerating the 2030 Agenda.

Integrating citizen science in higher education

CS has an important educative function as well in that it helps to educate both students and the public about science and the scientific process as well as making science more democratic by serving the common good. All those who serve the public interest, such as colleges and universities, should work towards making science more accessible and more participatory inside and outside of their institutions – in short, a more inclusive learning process.

In addition, there are many different types of science projects that students at all levels can get involved in. In higher education, for instance, CS projects could be part of a class project that students participate in and earn credit for while learning about real-world sustainability issues. Furthermore, the topic of climate change is an overarching theme of citizen science as it connects the natural and social sciences, making CS projects ideal for interdisciplinary projects.

CS projects can provide an effective way to make the course more interesting by engaging students in the community through real-world science projects, just as service-learning projects do to support the community. For natural science and related courses, some potential projects that promote the 2030 Agenda include monitoring biodiversity, assessing air and water quality, and ecosystem restoration projects, among other projects.

In social science and related courses, some potential projects include implementing recycling and circular economy initiatives, environmental conservation, energy efficiency initiatives, and climate change awareness programs, among other projects. In arts, humanities, and related courses, some potential projects that promote the 2030 Agenda include art projects to communicate sustainability principles, sustainable architecture, urban planning, revitalizing public spaces, and sustainable transportation, among other projects.

CS projects also serve the benefit of showing students across all academic disciplines why sustainability is important and it provides concrete ways that they can help promote activities that lead to a healthier planet. CS also helps to engage students who are underrepresented in STEM disciplines with an authentic way to learn more about science and increase their interest in sustainability. In addition, giving students choice in selecting the type of CS project they wish to with should help spark student motivation in CS.

Conclusion

Since the Industrial Revolution, and especially since the end of WWII, the world has become increasingly globalized and internationalized. As a result, the world has also become increasingly interconnected and interdependent. The more developed that nations become, the more this phenomenon will increase.

While interconnectedness can have potential negative consequences (for example, global pandemics and global recessions), this interdependency can also have many positive consequences, such as increased international trade (through comparative advantage), leading to a higher quality of life and standard of living for all.

To that end, CS provides many benefits to students, institutions, society, and the world at large. CS has a proven track record of success as an inclusive public practice. For instance, CS played an important role in helping to better understand the dynamics of the COVID-19 pandemic. By harnessing the power of crowdsourcing, CS can also help accelerate the implementation of the 2030 Agenda.

Science is not ideological. It can be applied to virtually any issue, Science is simply a way to understand the world, through empirical evidence, in order to make the world a better place for everyone. The scientific process itself has no agenda other than truth-seeking. As such, it serves everyone and benefits everyone when guided by humanistic values such as those articulated in the 2030 Agenda.

International
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HETL *Frontiers* Team

Martina Jordaan

Sameerah T. Saeed

Taisir Subhi Yamin

Rakel Kavena Shalyefu

Mojca Kukanja Gabrijelčič

HETL *Frontiers*

The aim of the International Higher Education Teaching and Learning Association (referred to as HETL) is to bring together higher education professionals and thought leaders from around the world to dialogue, network, and collaborate on issues relevant to teaching and learning in higher education.

HETL association, 138 Queens Blvd., Unit 105 Briarwood, NY 11435
E-mail: support@hetl.org
Website:https//www.hetl.org

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