
HYBRIDIZATION OF EDUCATION FOR SUSTAINABLE ENGAGEMENT AND OUTCOME: A CONCEPTUAL REVIEW ON HYBRIDIZATION OF EDUCATION FOR SUSTAINABLE ENGAGEMENT AND LEARNING OUTCOMES

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Abstract

The paper examined hybridization of education for sustainable engagement and outcome. Education is generally understood as the act of teaching people knowledge, skills and values. The purpose of education is to help individuals grow, get ready for life and support the progress of society. Hybridization of education, combining in-person and online learning, has emerged as a strategic approach to enhance engagement and learning outcomes, especially in the post-COVID era. Purpose: This conceptual review synthesizes existing literature on hybrid education, sustainable engagement, and related outcomes, highlighting their interrelationships and implications for educational policy and practice. Method: The paper employs a narrative synthesis of peer-reviewed literature from 2000–2024, with emphasis on post-COVID developments. Findings: Evidence suggests that well-implemented hybrid models foster flexibility, inclusion, and sustained learner engagement, though challenges such as infrastructure gaps and digital literacy remain. Conclusion: For hybridization to yield sustainable outcomes, supportive infrastructure, teacher training, and policy frameworks are essential. Recommendations: Policymakers should integrate hybrid models into national education strategies, ensure equitable access, and invest in teacher professional development.

Keywords: Hybrid education, blended learning, sustainable engagement, learning outcome, digital pedagogy

Introduction

In recent years, the global education system has changed a lot due to fast technological progress. The COVID-19 pandemic has greatly sped up this evolution, changing the way knowledge is

shared and learned (Mayer, 2023; Nerantzi, 2020). Using technology in education has resulted in new ways of learning and hybrid learning (HL) is considered a very promising approach (Kayi, 2024). The World Bank explains that HL involves using both in-person and online learning to make education more personal and engaging (MuñozNajar et al., 2021). Studies have shown that this model allows students to learn in a traditional classroom and also use technology for their studies (Singh et al., 2021; Biancardi et al., 2023). When hybrid models are put into practice, the educational environment becomes flexible, responsive and allows students to learn at their own speed, use different learning methods, use technology, follow personalized plans and stay engaged with different activities.

The Covid-19 pandemic has greatly affected how people live and has caused major problems for the global economy (International Monetary Fund, 2021). Covid-19 has made a significant impact on education. Because of the pandemic, schools in more than 200 countries and territories have closed, leaving millions of students without an education (UNICEF, 2021). Due to the closure of schools to prevent Covid-19, online learning has become more common. Teachers and students everywhere have made use of online tools to continue their studies during the pandemic. The COVID-19 pandemic has led to changes in teaching methods, the use of technology in schools and what students consider a good education (Marinoni et al., 2020; Schleicher, 2020; Tarkar, 2020).

It is difficult to analyze these changes in education because COVID-19 affects education as well as social, psychological, economic and cultural changes. Some authors, however, refer to the postcovid age (Ashfaqzaman, 2020; Stanistreet et al., 2020) as a new era in education. Even with the many challenges caused by the pandemic, there have been important changes in education that universities must address. Research on digital inclusion supports the idea that using technology in education can lead to social change by motivating people, providing access, teaching skills and encouraging use (Warschauer, 2003). The way these elements are formed depends on how resources such as time, materials, thoughts, relationships and culture are divided among different groups (van Deursen & van Dijk, 2019). If these factors are handled well, hybrid learning can be very beneficial, as recent studies have shown that proper implementation increases student involvement, access to education, fairness and cost savings when supported by the right institutional setup (Ashraf et al., 2021; Dash et al. 2022; Martín et al., 2022).

As e-learning modernized, blended learning was introduced to help teachers use both online and traditional teaching methods at the same time (Sivakumar & Selvakumar, 2019). In practice, blended learning means using both online and classroom learning to provide students with flexible, prompt and ongoing learning opportunities (Bazelais & Doleck, 2018). According to Vo et al. (2017), blended learning combines traditional classroom teaching with technology-based learning. It is defined as combining classroom learning with online learning activities (Rasheed et al., 2020). Blended learning is seen as a better alternative to e-learning because it helps with

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

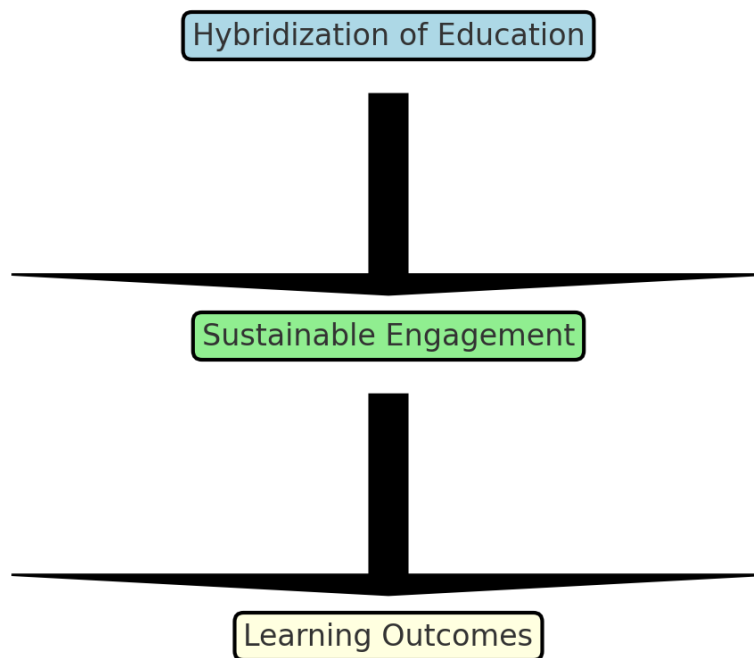
interaction, context and remediation (Berga et al., 2021). After that, Nasution et al. (2021) added to the blended learning model by stating that it involves both face-to-face and computer-based instruction.

Literature Review

Conceptual Framework

Hybridization of education blends traditional face-to-face instruction with online learning (Álvarez et al., 2022). Research indicates that hybrid models improve access, engagement, and cost efficiency when supported by robust institutional frameworks (Ashraf et al., 2021; Martín et al., 2022). However, challenges such as inadequate infrastructure and resistance to change persist (Rasheed et al., 2020).

The framework illustrates the relationship between hybridization of education, sustainable engagement, and learning outcomes. Hybridization, when effectively implemented, promotes sustainable engagement, which in turn enhances learning outcomes.



Concept of Education

It is generally acknowledged that tertiary education is a social institution that is preoccupied with imparting knowledge and skills for the effective functions of the individual in the society. It

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

fosters the worth and the development of the individual not only for his or her sake, but for the general development of the society at large, (Dede, 2016). Tertiary education is the education given after secondary education in universities, colleges of education, polytechnics, monotronics and including those institutions offering correspondence courses (Dede, 2023).

Educational institutions, the world over, see to some important aspect of individual and social life. These include among others socialization, civil engagement knowledge transmission, personal development, economic development, critical thinking and problem solving. Educational institutions are creations of the society that are charged with the responsibility of providing educational services to society folks (Igbudu & Dede, 2025).

Education is generally understood as the act of teaching people knowledge, skills and values. The purpose of education is to help individuals grow, get ready for life and support the progress of society. People can learn through formal education in schools and universities or through informal experiences. Education is a general term that includes knowledge, experience, learning and teaching. It involves gaining knowledge, skills, values, beliefs and habits that help a person develop and improve themselves or the community. There are many types of education, including basic, humanistic, technical, vocational, financial, social, science and technology and others. Education is meant to help people think clearly, benefit society and play a key role in social, economic and political progress. Education allows us to learn new things and also helps us grow in our thoughts, emotions, opinions and perspectives.

The development of individuals and society relies greatly on education. It supports people in improving their critical thinking, problem-solving, decision-making and communication skills which are important for both personal and work life. Education helps societies grow by creating a skilled workforce, advancing science and technology and preserving their cultural heritage. Education aims to help people live a satisfying life, support the growth of society and make wise decisions that benefit themselves and the community.

Hybridization of Education

Hybrid education, which is also known as blended learning, combines the traditional face-to-face instruction with technology-based and online learning. It involves integrating various pedagogical approaches to create a flexible and engaging learning experience. Hybrid learning gains relevance as it is considered an active learning methodology. Hybrid education is defined as an educational approach that combines face-to-face and distance instruction, using digital technologies both synchronously and asynchronously. This modality allows for diversifying

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

educational practices by using technology flexibly and adapting time and space to promote effective learning processes (Álvarez et al., 2022).

The hybrid education model requires both distributing content between platforms and inperson classes, as well as developing teaching and learning models that capture the attention and interest of the students in order to learn. In addition, it should ensure significant and integrated interactions between the students and the content, their classmates and teachers, all of which are essential for the learning process.

There are no previous experiences of implementing hybrid education on a large scale throughout an entire education cycle. However, the existing evidence on other learning modalities that use technology, such as online courses or in-person teaching with technology, shows that a successful implementation of the hybrid education model is possible. A review of studies in developed countries shows that blended education can produce learning results similar to those of the in-person modality (J-PAL Evidence Review, 2019) which suggested that this could be a cost-effective approach to continue learning, particularly when complete in-person education is not an option. It is important to note that, for distance teaching to be of good quality, it needs to be the result of a careful design and a structured and defined class plan (Means et al., 2014).

Hybrid Learning

Through the use of technology, the 21st century classroom now transcends beyond the physical classroom walls. Traditional face-to-face methods of teaching are now being replaced with distance learning, which may take the form of either fully online or blended learning. Online learning is defined as a form of education in which both instruction and content are provided to students primarily via the internet (iNacol, 2011; US Department of Education Office of Planning, Evaluation, and Policy Development Policy and Program Studies Service (2010). Online learning is frequently synonymous with the terms such as e-learning, cyber-learning, and virtual learning (iNacol, 2011). An example of online learning would be to view a lecture presented over the internet then to provide students with links to interactive activities for online submission. The teacher can subsequently provide written, audio, or video feedback to students in addition to providing a grade. Blended learning is defined as a minimum of 30% and a maximum of 70% of online teaching (iNacol, 2011; Allen et al., 2007). This term is often synonymous with hybrid learning. While blended learning is not necessarily new, the notion that this form of engagement can better facilitate student learning certainly is.

Blended teaching has the potential to expand the learning process beyond the traditional class meeting. Blended learning, therefore, may facilitate the formulation of a community of inquiry,

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

by fostering interpersonal skills across different forms of media through a common curriculum (Garrison et al., 2000). This fluid boundary between face-to-face and online interaction should ideally afford students with a more meaningful educational experience. Of note, social presence is designed to facilitate a climate of risk-free and open communication (Garrison & Vaughan, 2008). During students' educational experiences, activities for purposeful, goal-oriented interaction may be designed to meet curricular objectives using blogs, wikis, multimedia tools, and discussion boards. One specific form of blended learning is the 'flipped classroom' approach to hybrid teaching (Topp, 2011). A flipped classroom is one in which the teacher provides lectures/tutorials for students to review online. The in-seat classroom time is then spent on engaging in meaningful process activities which highlight the points provided in the online lectures (which students will have viewed prior to arriving to school).

Psycharis et al. (2013) investigated the role of e-learning as an instructional tool in the area of physics. More specifically, the objective of Psycharis and colleagues (2013) was to instruct students on electric circuits using a popular e-learning platform called the Modular Object-Oriented Dynamic Learning Environment (i.e., Moodle) (Hargadon, 2008). Using Moodle as an instructional tool, students individually responded to specific questions, became involved in cooperative on-line activities, and made predictions based on teacher directed problems with electric circuits. Both discussion boards and the glossary feature were further utilized to facilitate mastery of electric circuits. The unit culminated in a questionnaire regarding physics concepts and student perceptions of the e-learning method. Students' overall responses were positive regarding use of Moodle for learning concepts in physics (Psycharis et al., 2013). This study, in addition to the authors' teaching experiences, supports the use of Moodle, particularly for online discussion.

Hybridization of the Classroom

With technology, the classroom is no longer limited to the physical space. Either nowadays, distance learning is replacing traditional classroom teaching and it can be fully online or a mix of online and in-person learning. Online learning is when students get their lessons and instruction mainly through the internet (iNacol, 2011; US Department of Education Office of Planning, Evaluation and Policy Development Policy and Program Studies Service (2010). Online learning is often referred to as e-learning, cyber-learning or virtual learning (iNacol, 2011). A way to use online learning is to show a lecture on the internet and then give students links to online activities they can submit. The teacher may also give students feedback in writing, as audio or as a video, along with their grade. Blended learning is considered to be between 30% and 70% online teaching (i Nacol, 2011; Allen et al., 2007). It is commonly used interchangeably with

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

hybrid learning. Blended learning is not a new concept, but the idea that it can help students learn more effectively is new.

Blended teaching can help students learn outside of the usual classroom setting. As a result, blended learning can help students build a community of inquiry by encouraging them to interact with each other through various media using the same curriculum (Garrison et al., 2000). The mix of online and face-to-face learning should help students gain a more significant educational experience. It is important to mention that social presence is meant to encourage learners to communicate openly and without fear (Garrison & Vaughan, 2008). While students are learning, teachers may use blogs, wikis, multimedia tools and discussion boards to help them achieve the set learning goals. One example of blended learning is the flipped classroom' method used in hybrid teaching (Topp, 2011). In a flipped classroom, the teacher gives lectures/tutorials that students can watch online. After that, students take part in activities that help them understand the main ideas from the online lectures.

The use of Technology in the Classroom

With digital media and wireless networks, students can now interact with others outside their classroom. In addition, students can interact with each other in many ways, not just through the teacher's instructions. At the same time, teachers can now use Twitter as a digital tool in the classroom, asking students questions that they answer quickly and in different ways (Tække & Paulsen, 2013a). The teacher and class can discuss homework outside the classroom and students can watch a documentary on TV and discuss it on Twitter (ibid.). In addition, the class setting during school hours can help to students access educational resources.

During the second year of the Socio Media Education experiment (a three-year long action research project), we noticed some examples of this new way of learning. For example, the class used Twitter to talk with an author about his poems and they also had discussions with another class on another school about education. Using WIKIs to arrange, sort, save, access and share their educational topics is an example of a new opportunity. Another example is making media lines by brainstorming ideas on Twitter, discussing them on the digital board and saving the best ones on their wiki. Another important aspect is that students can create blogs to receive comments from others, use the internet to find information and learn how to evaluate it, follow politicians on social media and use Twitter and Facebook.

If students and teachers try to use the new possibilities, the classroom will function like a boat sailing the Internet or an atomiser distributing and collecting educational interaction. We believe

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

that there are two strong reasons for making this choice. The first point is that teaching can be improved and the second is that teaching also helps students learn how to behave and use new media, picking up digital literacy (a form of Bildung suitable for the new media environment).

Hybrid Teacher

Teachers are now using technology so much that they have become part human and part machine. It is the teacher who must take on the main role in finding ways to improve teaching using the new technology. On one side, the teacher should guide students by demonstrating how to use the new media wisely. On the other hand, the teacher needs to adopt a new approach, use different teaching methods and establish a new kind of authority. Now, teachers can observe students' work differently, as some of the old methods are no longer used.

The teacher does not see all the students' activities and conversations about him, but now he can view more of what happens in the class. Now, the teacher needs to act differently, as they can quickly access information from the top experts and sources. Nowadays, teachers are important in helping students search for information, do source critics, use various software, data base systems, behave in different social situations, use different genres on the web and invite people from the outside into their classes. As a result, the teacher needs to move away from the old power structure that existed in the echo room. All in all: the teacher needs to become a cyborg. If the teacher does not change, the students will only face the risks (spending a lot of time on private communication and computer games at school) and not the benefits of the new possibilities.

Hybrid Student

Now that students use tablets, smartphones and laptops, they are like cyborgs, a mix of human and machine. They can access all information, resources, networks, groups, personal relationships, libraries, mass media and other things on the Internet whenever they choose. The student can consult his brother or mother or someone else in her network who is an expert in the topic or use the internet or social media to find answers. Before, the student would have to wait until after school and either go to the library or ask her mother for information that differed from what the teacher taught. Students can also interact with each other about the educational interaction, the topic, the teacher or any other subject. Sometimes, students have these conversations with each other in small groups and the teacher or other students cannot see what is being said. We refer to these interactions as network interactions and the ones that everyone can see and are

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

limited to the class as community interactions. Students may use their new opportunities for things other than schoolwork. Cyborg-students will always pay attention to important topics, but we have noticed that some students hardly take part in schoolwork, as they are busy with computer games or chatting on Facebook.

Methodology

This study adopts a conceptual review approach, synthesizing literature from academic journals, policy reports, and empirical studies between 2000 and 2024. Databases such as Scopus, Web of Science, and Google Scholar were searched using keywords including 'hybrid education', 'blended learning', 'sustainable engagement', and 'learning outcomes'. Selection criteria prioritized relevance, recency, and peer-reviewed status.

Discussion

Hybridization offers a blend of synchronous and asynchronous learning that accommodates diverse learner needs (Vo et al., 2017). Benefits include increased flexibility, personalized learning paths, and greater engagement (Singh et al., 2021). However, effective implementation demands adequate infrastructure, teacher training, and equitable access (Dash et al., 2022).

Sustainable Engagement

Sustainable engagement is about fostering long-term involvement and support for a cause, project or organization, ensuring it remains viable and impactful over time. It is about building relationships and ensuring that everyone benefits and contributes to shared goals. In other words, it is a meaningful connection and involvement particularly in the context of sustainability efforts, whether within organizations, communities or individuals. It goes beyond a short engagement aiming to promoting and adopting sustainable practices.

Sustainable Engagement Practices include:

1. **Active participation:** this involves the genuine involvement of individuals in supporting and implementing sustainable actions. It extends beyond simply raising awareness and encourages the active integration of sustainable behaviour into daily life. It emphasizes sustainable dedication to sustainability efforts over a period of time, rather than superficial involvement. It often involves partnering with communities and stakeholders to cocreate and implement solutions that are culturally and regionally appropriate.

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

2. **Employment engagement:** in an organizational context, it focuses on engaging employee in a company's sustainability journey, encouraging their active contribution to environmental, social and economic sustainability.
3. **Community engagement:** it also involves engaging communities in sustainable development initiatives and ensuring that projects align with local needs and aspirations.
4. **Sustainability work:** in the context of work, it refers to maintaining a healthy work life balance that allows individuals to sustain their connections and engagement with their work.

Advantages of Sustainable Engagement

1. It helps keep employees happy and motivated.
2. If employees feel involved and notice the results of their efforts, they tend to be happier, more motivated and dedicated to the organization.
3. It makes employees happier at work- when people take part in sustainable activities, they often feel more connected to the company's mission.
4. When employees are engaged, they tend to be more productive and come up with new ideas.
5. Building trust and strong relationships with communities can result in better and lasting development projects.

Hybridization allows students to benefit from both in-person and online learning. For over a decade, mixing different formats has made it possible for many students to get the education they need for their courses and programmes. During the COVID-19 pandemic, when people could not go to schools, those that used blended learning, connections and remote working were very helpful, as classes could continue without any breaks. Even though the positive balance points to many opportunities for supporting sustainable engagement, the success of implementation relies on having infrastructure that supports good teaching and results, while managing cost, quality and scalability.

Benefits of Sustainable Engagement

The following are some of the benefits of sustainable engagement.

1. It improves employees retention and morale- when employees feel engaged and see the impact of their work, they are more likely to be satisfied motivated and committed to the organization.

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

2. Enhanced job satisfaction- engaging in sustainable efforts can enhance jobsatisfaction and make employees feel more connected to the organizational purpose.
3. Increased productivity and motivation- engaged employees are more likely to be productive and contribute innovative ideas.
4. Stronger community relationships- engaging with communities can build trust and strengthen relationships leading to more effective and sustainable development initiatives.

Outcome

Outcome refers to a result or consequences of an action, process or intervention. It can be used in various context, including education, project management and social change initiatives. In educational settings, learning outcomes describe what students should know, understand or be able to do after a period of learning. In a broader context, outcomes often represent the changes or impacts resulting from program or intervention, such as improvement in education, economic or health development.

Youth empowerment is multifaceted process designed to equip young people with skills and resources to take control of their lives and make informed decisions. It aims to foster a sense of agency and responsibility in young people, enabling them to participate fully in society and also contribute to their communities and the broader development of the nation.

Outcomes of youth empowerment include:

1. Improved quality of life- empowered youth is more likely to have better education, and employment outcome
2. Reduced inequality- it address inequality and marginalization by ensuring that young people have access to opportunities and resources.
3. Sustainable development- empowering youth will make them active contributors to sustainable development.
4. Positive social order- when youth and empowered, they become active participants in social change.

Conclusions

Hybrid education presents significant opportunities for sustainable engagement and improved learning outcomes. To harness these benefits, educational systems must invest in technology infrastructure, build teacher capacity, and adopt policies that institutionalize hybrid practices.

Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

For more than a decade, mixing formats has allowed a great deal of students to access quality education tailor-made to their particular needs and the requirements of their courses and programmes.

The type that combine blended learning, connections and remote working proved to be a good opportunities, especially in periods in which it was difficult to access education centres during the COVID-19 pandemic, when movement were hugely restricted, allowing classes to continue without interruption. While this positive balance suggests considerable potential for supporting sustainable engagement objectives, successful implementation depends heavily on infrastructure that enables effective pedagogical development and outcome, while balancing cost, quality, and scalability.

Recommendations

The following suggestions were given for this study:

1. Policies that encourage hybrid education should be developed and put into practice by government and policy makers.
2. Research Institutions and Think Tanks should study how hybrid education works and what its effects are, offering the necessary support, insights and best practices for policymakers.
3. The ministry of education should collaborate with important institutions to provide the necessary resources and technology for hybrid education in the country.

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Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

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Hybridization of Education for Sustainable Engagement and Outcome: A Conceptual Review on Hybridization of Education for Sustainable Engagement and Learning Outcomes

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