Innovation in Education System

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Abstract

Innovation in educational systems is vital to improving the school's efficiency and productivity in the 21st century. The implementation of innovation in education will ensure that the existing educational system will produce skilled and knowledgeable students to fulfil existing and future industrial needs. However, the implementation of these concepts is still debated among scholars nowadays as it still blurs in concept, definition, and applications. Therefore, this paper tried to provide a single and suitable definition for innovation in educational purposes. It also aimed to give a slight view on the type of innovations in education, identified the differences between the concepts of innovation in education with technological advancements, and to identify the barriers for the implementation in innovation in educations.This article will contribute to the development of innovative concepts in educational institutions and public relations.

Keywords: educational innovation, school change, types of educational innovation, barriers to innovation.

Introduction

Education as a social institution is necessary in all countries for society to survive and meet its needs. Education must not only be broad, accessible and exceptional, but also constantly evolving to meet the needs of a rapidly changing and changing global environment.

The educational system needs to be designed to nurture creative and critical thinkers that focused on contributing knowledge to society. Problem-solving, knowledge building, collaboration, expert engagement, self-regulation, and the application of technologies are the learning outcomes of 21st- century education. The evolvement of the education system must be systemic, consistent, and able to measure. Lecturers, teachers, researchers, administrators, and policymakers are all required to improve the teaching and learning philosophy and practice, or other aspects involved in the process of teaching and learning to ensure that the student meets the quality of life and work. It is said that the force that will take the global society to the future is knowledge, and innovation. The globalisation had placed a strain on education to build a creative and innovative workforce, to achieve a competitive advantage. Therefore, it is shifted to current focus to innovation. Globalization has also stimulated education companies to offer innovative education products, procedures and market models to bid with increasingly savvy global customers.

Innovation involves moving from what we do now to creating new concepts that allow us to do our work differently. Current teaching methods do not provide students with the ability to use knowledge to solve problems after leaving school. Education has not paid much attention to learning itself and overlooked the importance of learning to solve problems. Innovation breakthroughs will transform learners from simply using knowledge to creating new ones, making them central to the educational environment. It is emphasized that innovation in education is essential to improving education. Innovation will increase the country's efficiency and improve the quality and equity of education. Productivity and efficiency are key issues in education today.

Efficiency is calculated using differences in capital expenditures and student achievement and equity outcomes. The biggest productivity and efficiency challenges in education arise when comparing the education sector to other industries such as the healthcare sector. Advances in technology have affected the health sector as much as they have affected education, but they have done better than education. Innovations in education have been a common topic of public debate, but are nonetheless inherently ambiguous and realistically ambiguous. Innovations in education must bring about desirable and valuable changes in order to be called innovations. In most cases, these

innovations will not be approved by a diverse group of people. Innovation should be able to improve the current situation compared to the previous situation.

Innovation is always based on experimentation and knowledge improvement. It is a changing process and practice. Its purpose is to improve the quality and performance of a service, product or process. However, a major challenge associated with transforming education is the lack of data. Current research on innovation in education often focuses more on research and development (R&D) and patent spending or innovation data collected from company surveys. This action is not sufficient to address the critical challenges of educational innovation.

Another challenge facing educational innovation is definition- Innovation goals require different types of innovation. Innovation is not a linear process. Instead, it is a complex product made up of many actors such as researchers, teachers, educational institutions, governments or other stakeholders The concept of innovation has been discussed, developed and defined in various disciplines such as anthropology, economics, psychology, business administration, linguistics, cognitive science, philosophy and many others. Therefore, there is currently no single definition of educational innovation. It is said that the difficulty of defining innovation is because it was challenging to describe and measure innovation when the objectives and activities involve are not define accurately. Therefore, the objectives of this paper are to define the innovation in education, identified types of innovations in education, and the barriers to implement it in education.

Definition of Innovation in Education

The discussion on the definition of innovation sometimes mixed with the concept of the invention, change, and reformation in education. Some scholars also define innovation in education as a process, and some even explain it according to innovation theories in business development. These various definitions of innovation in education are very confusing when we try to discuss innovation in education.Currently, the best-known definition of innovation in education comes from the Oslo Manual Innovation is defined as the implementation of new or improved products, services, offerings, marketing strategies or new organizational strategies, external relationships or workplace organization.The definition of innovation can be applied to education with minor modifications. Innovation in education as the introduction of improved or new processes, products, services, new ways of managing activities or new marketing approaches. However, according to some scholars in the field of education, this definition of innovation cannot adequately describe educational innovation.\

We can also distinguish between innovation and reform and change. Innovation is defined as the implementation of new and better ideas, practices and knowledge. Reform, on the contrary, systematized and meticulously carried out the process of making change. A change is therefore a planned or unintended transformation or modification.

Organizational change usually occurs at the macro level, involving change throughout the organization, with major subsystems rather than smaller workgroups and individuals. Innovation, on the other hand, is usually about localized impact on an organization.Change is necessary for innovation, but not a condition for innovation.

It is also said that the term "educational innovation" is sometimes confused, sometimes understood to describe and evaluate, and sometimes to mean improvement.The definition of educational innovation is different from educational innovation. Education innovation has a broader definition than education innovation. Definitions include education, social, scientific and technological, economic, administrative and other innovations. Scientific and technological innovation is the result of R&D of intellectual property transferred for implementation and application. On the other hand, social innovation consists of social support for students and teachers. However, educational innovation can be defined as a method or procedure in educational activities that differs from conventional practices, the goal of which is to increase the effectiveness of education in a competitive environment. Innovations in education consist of scientific, methodological, technological or pedagogical innovations. Innovation is not just invention, on the contrary, it is a cycle consisting of several stages and the collaboration of

many stakeholders. Most scientists agree that in order to be called an innovation, an innovation must deliver improved results

Educational innovation as new products, new processes, new ideas that change people's perspective on a problem or question, rethinking our ideas about what is possible, and innovation at the platform level. The platform-level innovation referred to here is a common concept architecture consisting of a framework, a set of definitions, protocols that provide a framework to which standard and modular components are connected. The words of practice, an idea or an object does not define the innovation much in the idea of perceived by newness for adoption. Hagreaves (OECD) defines innovation as individual creativity and creative thinking to solve the existing problems differently and theoretically better ways, far from the original methods. While this definition sheds some light on the definition of innovation by referring to change, new and better results, and most importantly, a successful idea or practice, this is still not sufficient in the field of education. Therefore, according to Smith (2006), the definition of educational innovation should focus on the innovation process. Innovation must be allowed for evaluation with respect to the integration of innovative technologies, approaches or resources into learning activities. This will create a solid foundation for policy makers, students, teachers, educators and other stakeholders who can influence the direction of education.
Innovation should always be linked to ideas playing with new ideas. It will provide some space for practitioners to evaluate and reflect on their existing methods in teaching and learning and decided if innovation needed.

Innovation is a process of organizing and sustaining the combination of concepts, actors, and practices to address specific problems. According to Smith (2006), there are five interrelated moments together with this concept, which are; 1) innovation as a process, it is different from invention; 2) the process is both dynamic and social at the same time, it involves the discussion to recruiting new entrants thus retaining the current players in the innovation sector; 3) the basic concepts for innovation are ideas, players and practices together in a novel way; 4) the main objectives are to address the problems, issues or crisis that arise; 5) since it is only targeted at specific problems, it is mostly subjective in its novelty. The new alignment of practices, ideas, and players are only treated as a novel in a specific location, time, and context. The innovation process must involve five steps, called the innovation cycle. This cycle consisted of clear about the problems or issue that need to be solved, idea generation based on experiences and situation to solve the problems, this idea then had to be refined and tested, provide and share the evidence and facts, and there is always allowed for feedback to enable the continuous improvement in that particular innovations. According to Wai (2017), this innovation 'platform' and 'process' must be aligned with the existing innovative teaching and learning in the classroom, and also must have impressive networking to produce a massive impact in education.

The other definition of innovation in education is as a concept (Findikoglu& Ilhan, 2016). According to them, innovation is a concept that connected societies and future economics. It is a way of finding the best alternative ways of changing individual behaviors' in the individual when the existing ways such as learning theories, learning tasks, teaching methods, and learning approaches are not working effectively.

According to Collingwood (2006), innovation is not only a mechanistic process but also a developmental one. This has changed not only innovation but also acceptance systems. Planning for innovation in education systems is a management process that consists of the nature of the innovation, the environment in which it occurs, and the characteristics of potential users.

Thus, the efficiency in education generally measured by the amount of time spent, resources, and cost of money involved to achieve the targeted results. If we can achieve the result with less amount of time, less money involved and overall, less effort put into it. Then productivity will increase.

As mentioned above, we can summarises the approach of the definition of innovation in education into; a) innovation in education is the introduction or implementation of new products, new processes, new approaches, new methods, new administration approach, or anything new introduced in educational areas that brings a massive impact of improvement in producing quality students; b) the

introduced innovation must be good enough to minimise the time, budget and resources spending to obtain the desired results; c) the innovation must be accepted and supported by all stakeholders in the educational system; the learners, teachers, parents, researchers, educational administrators, policymakers or communities. This definition does not define innovation in process, product, or concept, as mentioned above, because innovation happened in every stage of education.Thus, innovation can be characterized according to its concept, the stage in which it occurs. Whether it is at the conception stage or at the implementation stage, the level at which innovation occurs (whether in a small group of teachers or at the management level) or type of innovation can be disruptive. It can be gradual or radical.

Innovation and Technology

Technology is a major driver of innovation. Many articles have discussed innovation in terms of technology. It is stated that innovation does not necessarily mean the adoption of the latest technology. According to them, innovation and technology adoption are two interchangeable terms. Innovation in education is therefore seen as the use of technology itself. Innovation is not just the introduction of the latest technology. This should be embraced as a process that provides an engaging learning experience for students who use technology. The use of ICT alone in teaching and learning is neither an absolute innovation nor a major goal of education This will make the learning process easier or make the structure of the content delivered to students much more expressive and understandable, and will certainly save more time and resources compared to traditional methods.This gives teachers more time to plan other class activities for review and implementation.

There no significant improvement in mathematics and literacy achievement using the advancement of ICTs across the majority of OECD countries, although the differences in national revenue and socio-economic standing have been taken into considerations. This weak performance is due to the schools and educational system not yet identified the technologies potential, the restricted abilities of students and teachers, the difficulty in identifying quality and useful software and resources, learning goals is unclearly defined, and lack of preparation on how to incorporate technologies into teaching and learning process and learning process. When the planning focused more on the technology, we may miss out on the leading player in the process, which are the teachers and learners.

The problems of educational technology in innovation are twofold. First, any incorporation of technologies in the phase of teaching and learning is intended to improve the efficiency of teaching and learning.However, this can only be achieved if effective pedagogical theory is used as the basic framework for these implementations. Second, the introduction of technological innovation will undoubtedly make a difference and lead to educational innovation. However, this is slower and more difficult, and sometimes there will be more financial, human resource or technical losses before ultimate success is achieved. Educators must recognize that computers cannot replace humans.

Thus, the implementation of technological innovation must go hand in hand with the existing leadership, pedagogical theories, and research in education. That even digital technologies could not transform education, but it still has a substantial potential impact on the learning and teaching process in schools and can open up a new perspective in teaching and learning processes. The integration of new modern approaches is the most prominent challenges compare to technological barriers.

These advancements of technologies that drive innovation in education do not come with only a positive impact on education.The users of the technology widely would have both negative and positive impacts on student's memory systems and attention. It is also noted that the introduction of modern media into education, especially computers, will impair our ability to think, remember clearly, and write or read with concentration, as all these activities require creativity. There are many side effects discussed on the technology enhancement in education involving the social, culture, and psychology. One of the apparent effects is the promise of unrealistic hopes in technologies to solved every teaching and learning problem in education. This effect will lead to weakening the student's and teacher's efforts and, without realise had taken the teachers out of the process

These interactions are necessary for student development. Online learning also required well-developed students with critical thinking, advanced reading and writing skills, technical skills to conduct research, higher self-efficacy than most, motivation and perseverance. Almost all younger students do not yet possess these qualities. So while innovative technologies seem to bring improvements in some areas, they are still not the only way to increase the efficiency and productivity of the existing education system.

Types of innovation in education

Innovation can be categorized into four types, which are process, products, organisational, and marketing innovation. Product innovation is the execution of services or goods in education that improved from its original characteristics or use. It includes the major changes in materials and parts, product features, user-friendliness, existing software, and other functions. Process innovation is the execution of the new or substantially better delivery services or products that incorporated major changes in software, types of equipment, or techniques. Meanwhile, innovation in marketing is the new marketing approach that emphasizes the changes in product design, product placement, product packaging, product pricing, or promotion.

Organisational innovation is the introduction of new organisational approaches or strategies in business, workplace structure, or its relationship to other organizations. Innovation in education can be categorized into four types which are; 1) introduction of new services or products such as new curriculum, educational resources or textbooks; 2) introduction of a new process in delivery the services such as the use of technologies in e-learning activities; 3) introduction of new approaches in activities organization such as the use of ICTs to interact with parents and students; 4) introduction of new marketing techniques such as the cost for each course in university.

Some of the educational scholars define the type of innovation based on innovation theories. Smith (2009) stated that there are two types of innovation in education that are disruptive and sustaining.

A disruptive innovation is an out-of-the-box innovation. This is another practice of serving a group of people. It creates new structures, ecosystems and architectures for old practices. Continuous innovation is innovation that improves an existing product, process or service. It is said that innovation in education should have the characteristics of both sustaining and disruptive innovation.

Thus, fundamental changes and fundamental improvements will be made in the existing education system. Innovations in education are technical innovation, conceptual innovation, and relational innovation. Technical innovations include the use of various new technologies in education; conceptual innovations are the introduction of new courses, new educational methodology, or new educational programs; relational innovation is the better way of establishing and communication interactions inside or outside educational institutions. Innovation in education could be categorized as either disruptive, revolutionary, evolutionary, or sustaining. Evolutionary innovation will lead to continuous incremental changes. The revolutionary innovations will change the system completely, restoring the outdated systems with a better one within a limited time.

Meanwhile, the sustaining innovation linked to the achievement, such as the continuous enhancement in the instructional. The disrupting innovation will change the whole system, such as a national curriculum reformation. Innovation also can be treated as tangible as technological resources or intangible in approaches, methods, or techniques.

Evolutionary innovations in education consisted of the introduction of new multimedia materials, new mnemonic techniques, more efficient teaching strategies, the introduction of few learning strategies such as case study, inquiry-based, problem-solving, small group discussion or collaboration. Meanwhile, the application of educational technology in education can sometimes be evolutionary and sustaining at the same time because it is only involved in a minor change in certain aspects of learning.

The transformation or reformation of the educational system and online learning always in revolutionary innovations as it will completely change the whole system.

According to another author there are three types of innovation in the internal environment of education which are the educational innovation, administrative or managerial innovation, and

ideological innovation. Educational innovations are the innovation that happens in teaching methodologies, the curriculum content, high professionalism of the teaching staff, organisational and methodological support of the educational process. Administrative or managerial innovations are the support given to educational institutions structures, management at the subdivisions such as faculties or departments, general management systems, and its' structures, or the delivery system of the educational services quality.

Meanwhile, ideological innovations are the participation of educational institutions in specific programs, events, or competitions held by the government and the ministry of education.

All the discussions above lead to the perspectives of the own scholars to define the type of innovations according to what they believed. However, innovation in education defines before is the new product, process, methodology, or anything new that brings significant changes to the educational system. These changes can happen either in incremental, radical, evolutionary, revolutionary, sustaining, or disruptive. It also can happen in every level of educational institution either in a small group of educational, department or faculty levels, administration, organization, or at a national level.

Limiting innovation in education to specific types of innovation is misguided because it limits the nature of the innovation itself.

Barriers to Education Innovation

A key feature of innovation is the introduction of new changes to old ones. Sometimes changes benefit an organization or group, while others negatively affect the system. Therefore, introducing innovation into an outdated and rigid system, especially the education system, is sometimes frowned upon. The greatest barrier to educational innovation is the direct exposure of both students and teachers to change. This disapproval can occur when an innovation results in radical change but without meaningful results or outcomes. Innovations should be evaluated prior to implementation. All stakeholders must provide evaluation results. So you can decide whether to accept or reject the new changes. Conversely, this is not what happens in the real world of innovation. The outdated and traditional structure of the education system is a major barrier to innovation in education.

Barriers to innovation are lie in the traditional political and structural arrangements in education, the market dynamics that unsupportive to innovation, and the broken R&D cycle in education. The lack of clarity on the problems to be solved, ideological disagreement between the purpose and role of public education, states' rights, and parent rights creates confusion among the policymakers and inhibits innovations. Innovations are rarely translated into policy changes in education and a little support by the governance makes it harder to implement. In market dynamics and incentives to promote innovation, there are large companies that monopoly the whole market. Small businesses may not survive even if they creategreat and effective innovations. Schools or educational institutions with limited budgets and financial plans are well known. It's difficult to introduce technology into an education system if maintenance or upgrades don't go hand in hand. Teachers can choose not to use technology that becomes outdated over time. Teaching professions, school leadership and educational administration are created for licensing and promotion. Therefore, there is no incentive to try innovative practices to improve student outcomes.

Conclusions

Innovations in education can only transform the educational system if there are widely accepted by the students, teachers, administrators, communities, and any stakeholders related to the educational system. The introduction of the innovation must have a significant impact on the educational system or achieved its objectives. It is not only applied to educational technology innovations but also various types of other innovations. Innovation generates such a powerful impact on promising a newer, better, and improved educational system for a better future. Finland, Singapore, China, and Hong Kong are the example of the few countries that make innovation as their core transformation and succeed in achieving a higher result in student's performance.

However, many problems were encountered in the early days of implementation. A professional culture that supports school innovation, teacher reflection, and meaningful debate about

new pedagogies has been shown to lead to higher levels of innovative pedagogy. Schools, teachers, administrators, and students must be given alternatives and time to accept or reject innovations in schools. In the school context, innovations that emerge from school needs will yield better results than external innovations . Teachers and students must be at the center of these innovations. Teachers need to reflect on their learning and come up with innovative solutions to problems in the classroom. This will indirectly empower teachers and improve the quality of education. Education systems must be bold enough to give teachers more autonomy in determining their own teaching and learning processes. All of this must be supported by school leadership, culture, administration, parents, community and government.