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How technology is transforming innovative education and providing solutions during a pandemic disruption

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Abstract---The existence of technology, especially in education, is an undeniable fact; especially technology can transform education into more innovative and creative and provide solutions when various crises, including pandemics, disrupt the educational journey. The author believes that it is better to examine various critical literature in answering the above problems. For this reason, this study has reviewed more than 100 discussion topics and succeeded in obtaining approximately 50 topics summarized in a literature review involving a data coding system, in-depth data interpretation, and concluding that we believe the data is valid and reliable in answering the study problems. Based on the exposure and discussion of our final findings, we can say that technology, especially digital applications, has transformed world education during times of crisis towards innovative, creative, and solution-oriented education. Based on the capabilities possessed by technology, its existence, especially digital applications, has become a solution for carrying out global education during the pandemic that hit the world. The findings of this study will be helpful for future similar studies.

Keywords---Technology, Education, Transformation, Innovation, Solutions, Pandemic Disruption, and Literature Review.

Introduction

The development of science and technology is currently increasing. The rapid development of information technology also impacts life, from the beginning of personal life to business. This kind of life is known as e-life style, meaning that life is electronically influenced by various needs, which also impacts the efficiency of various aspects of life (Krishnamurthy, 2020). The development and management of information technology are felt in all aspects of life, including education. Entering the information age, the development of science and technology is now proliferating. This development can also be felt in education, where learning and evaluation methods continue to grow and change. In a time of unstoppable globalization, information technology is a must that is ready to transform life and education, if not absolute. This is in line with developments that have penetrated various aspects of life, ranging from economic and technological aspects to educational aspects. In this field of education, innovation through transformation is an absolute must because, without innovation, there will be a stagnation in the world of education, which will have an impact on other elements of life such as politics, economy, society, and others (Galanakis et al., 2021).

Many elements need to be considered by teachers and education movers, especially in the field of education that optimizes technology, and having a positive attitude towards the development of digital technology applications has great potential for educational progress (Goh & Sandars, 2020). The ability to access education using this technology will have a tremendous impact on developing the curriculum and learning itself. So the ability of lecturers and teachers to use technology both in the classroom and in the classroom does not need to be improved as well as their ability to evaluate learning outcomes. Skills such as technical how human resources will be more skilled in this technology must be updated continuously so that their knowledge and skills continue to be updated in the context of significant change; for example, technology can no longer be avoided, such as student recruitment, which is fully connected to the computer system. It is no longer possible to mobilize students or as many people as possible shortly (Sheth, 2020).

However, it can be implemented with a technological system beneficial to the main road participants and themselves. So that the activities and work of graduates together are light (Nah & Siau, 2020, July). However, the achievement of goals is higher because This requires studies and investigations that lead to the optimization of technological capabilities to innovate learning outcomes both at school and at home in the high school in terms of the use of technology for payment and evaluation of learning outcomes. So technology is seen as a positive thing but must be seen as something creative to innovative which is used to handle all information on handling student murder, learning, funding payments, and also the final evaluation, all of which will use audio eight applications according to the objectives of each department and the work involved.

Independent and faster learning outcomes. This innovation utilizes many PCs to handle information and organizational framework to associate one PC with one more depending on the situation, and media communications innovation is utilized so information can be dispersed and gotten internationally (Tidd & Bessant, 2020). The job that can be given by using this data innovation is to get data for individual life like data about wellbeing, leisure activities, amusement, and otherworldliness, and above all, data about instruction. Data innovation is an ally of institutional abilities, including instructive organizations. Different angles behind the advancement of innovation, particularly data innovation, is the profound inclusion in its application. For instance, in the realm of instruction, this has been felt since the approach of web innovation which makes all entrances close and genuine (Urbinati et al., 2020).

One of the instructive cycle characteristics is, in all honesty, the introduction of data. In introducing data, it should be open. In correspondence as a rule and training, the correct data introduced is the necessary data, which is significant in the feeling of being monetarily productive. Executing three is, in fact, conceivable (Himanen et al., 2019). Socio-mentally good as per existing standards and values. As per or following existing advancement arrangements/requests. Indonesia is the fourth biggest country on the planet; obviously, it has many difficulties in the realm of instruction, including the many young youngsters who have not received nine years of training, the lopsided dispersion of instructive offices and foundations, for example, web and phone lines, the low graduation pace of the National Examination as well as the expected consequences of the National Examination, the inferior quality of the skill of showing staff, the low usage of ICT in schools that as of now have ICT offices (low utility) then again, not all schools have sufficient ICT offices. Fundamentally, ICT is not PCs and the web, yet ICT also incorporates data media like radio, TV, and correspondence media, such as phones, PDAs, SMS, MMS, music player, video player, and computerized photograph cameras, video players, and digital book reader (Helbing, 2019).

So, many alternative media can be chosen by teachers to create a fun and memorable learning atmosphere. ICTs utilized appropriately and suitably in instruction will grow to learn unique open doors. Further, develop effectiveness, work on the nature of learning, educate, work with expertise arrangement, support practical deep-rooted learning, develop strategy arranging and the board, and lessen the computerized partition (Kusumawardhani & Nurhayati, 2019). Some subjects and articles play a functioning, dynamic, and intuitive job in the learning room in the instructing and learning cycle, both inside and outside the study hall. Instructors and understudies are both expected to make a learning environment, and the exchange of information is fun and not exhausting. Hence, the job of instructors and understudies in the study hall that incorporates ICT in advancement should be perceived and played, and expected. Presently in the period of ICT-based instruction, the instructor's job is not just as an educator but also as a facilitator, associate, guide, mentor, chief, and learning accomplice for understudies (Mangal & Mangal, 2019).

Along these lines, instructors and educators give understudies shocking decisions and the obligation to encounter learning occasions. With the instructor's job as expected, the job of understudies likewise changes from detached members to

dynamic members who produce and offer information or abilities and partake however much as could reasonably be expected like a specialist. Then again, understudies can advance independently and cooperative learning with different understudies. To help the mix interaction in learning, the school, the board, educators and understudies should comprehend the nine standards of ICT combination in realizing which comprise the accompanying standards: Dynamic: Enables understudies to be effectively engaged with an intriguing and significant learning process. Valuable: Allows understudies to integrate novel thoughts into their past information to comprehend the significance or wants and questions that have been to them. Cooperative: Allows understudies in a gathering or local area to cooperate, share thoughts, ideas, or encounters, prompt or give a contribution to individual gathering individuals (Alamleh, 2019).

Technology is exciting and allows understudies to be dynamic and energetic to accomplish what they need (Kumar et al., 2019). Context-oriented learning also allows the learning circumstance to be coordinated toward a significant learning process (real world) and through issue-based and case-based learning draws near. Similarly, dialogue enables the instructing and learning process, which is innately a social and dialogical process in which understudies benefit from the correspondence cycle inside and outside the school. Intelligent: Allows understudies to acknowledge what they have realized and think about what they have realized. As a feature of the learning system itself 8. Multisensory allows the student to be passed on to a few learning modalities such as sound, visual, and sensation. High request thinking abilities preparing: It is feasible to rehearse higher request thinking abilities, for example, critical thinking and independent direction, and, by implication, move along "ICT and media proficiency (Wu et al., 2011).

As made sense of above, valid proof of the execution of ICT-based learning could we take a gander at the planning of the Learning Implementation Plan (RPP), and each subject instructor in the school does its execution (Chucks et al., 2020). RPP that incorporates ICT is ready with two methodologies to be specific a hopeful methodology and a commonsense methodology. The hopeful methodology should be possible by deciding the subject, then deciding the learning targets to be accomplished, and deciding learning exercises using ICT like modules, worksheets, VCD-DVD, CD-ROOM, or web-based learning materials on the web. At the same time, the commonsense methodology should be possible by recognizing ICT like books, modules, worksheets, VCD-DVD, CD-ROOM, or online materials on the web and afterward deciding the subjects that can be upheld by the presence of ICT and afterward deciding the technique that will be utilized to accomplish fundamental skills. What is more, it marks of accomplishment of gaining results from the subject of conversation. The procedures utilized in the two methodologies above are asset-based learning techniques, everyday issue-based learning systems, reenactment-based learning techniques, and joint learning procedures (Agarwal et al., 2020).

Method

In the next section, we discuss the method and the materials we have done to answer the problem of the study, namely how digitally transforms education in

the world and provides educational solutions to the impact of the global pandemic (Abel Jr, 2020). First, this study begins with the formulation of the problem, then pregnant by collecting data from many literature sources, which are primary sources of reading scientific publications from field studies and readings from websites that discuss digital issues, pandemic-disrupted learning applications, and the solutions provided by the existence of digital technology to the solution when education is disrupted, school closures (Bdair, 2021). However, continuing education remotely, the point is that after the data is collected, we review and explore the literature with a phenomenological approach that seeks to gain understanding and conclusions from several data with the aim of valid data, up-to-date findings can answer the problem from the point study process is that after the review process, it involves a comprehensive data coding system, comprehensive evaluation, in-depth data interpretation and drawing valid conclusions, with the following question we ask.

The results report design under a qualitative design approach where we are guided by previous studies into the category of a literature review so that this study is easy to understand because the study gains an understanding of the phenomenon of digital technology in learning innovation and evaluation when world education is now gripped by a global pandemic disaster that is to this day (Mardiah, 2020). This is still. This is a global issue, especially for education activists who must find the best solution, namely empowering academics with the skills to use digital applications. These are the steps and stages of a review study to obtain scientific evidence of how digital applications can transform and innovate education during a global pandemic (Wolfswinkel et al., 2013).

Discussion

In this modern era, technology has become a basic need. The role of technology is very influential in supporting daily activities, not least in the education sector. Teaching and learning activities that only rely on textbooks have become entirely digital. Thanks to advances in technology, the learning and evaluation process has become more interactive and fun. Learning media has changed, and teachers are also moving with the times. This is none other than the advancement of the younger generation who will become the nation's successors. Here are the roles of technology in education which we have studied from various sources to answer the objectives of this study.

Digital makes learning more effective

Sometimes, some students have difficulty understanding the material concept in the traditional learning process. Simulations and digital models can help students understand various subjects in unique ways (Anastasiadis et al., 2018). Explicit instruction is an instructive interaction that permits understudies to advance proficiently, have a good time, and accomplish shared objectives. Teachers are expected to increment learning viability so that learning can be helpful. One reason was the shortfall of clear instructive objectives before they were done to learn exercises. This causes understudies and teachers not to know what "objectives" will be delivered (Collins & Halverson, 2018). Numerous assessments expect that conventional training is viewed as just a custom to shape Indonesian

HR. Regardless of the consequences of formal learning, the main thing is to have done schooling at an undeniable level and be viewed as critical by the local area.

This supposition makes the viability of instructing in Indonesia exceptionally low. The job of understudies in learning and self-advancement is a critical part of an educator's discussion (Bikowski & Casal, 2018). The advancement of learning programs is supposed to help teachers convey learning materials more productively and actually. It can expand understudies' learning inspiration, which influences the degree of learning capacity, and its accomplishment is compelling to learn targets. The presence of ICT, which can be utilized as a learning medium, is supposed to be an answer to defeating the absence of innovativeness in understudies and educators in learning at school. Likewise, the present society additionally has numerous PCs and journals, so creating learning is conceivable. Moreover, technology also helps make it easier for teachers who have difficulty explaining some material. A teacher can deliver subject matter using digital simulation tools such as downloadable materials, digital-based exams, and virtual reality gadgets (Autio et al., 2018).

Global communication crosses national borders

The rapid advancement of technology has also opened up opportunities for students to take global classes. Students can form online groups or virtual communities that connect students and teachers from various parts of the country. Through online communities, they can discuss questions and answers (Flew, 2018). By knowing various opinions and answers, students' thinking patterns will improve and they will understand the material better. The quick improvement of computerized innovation likewise affects human existence where the example of life has additionally changed to turn out to be advanced. Many organizations have started to foster application stages to simplify serving their clients. The utilization of online business applications has become one of the principal needs of Indonesia. From searching for transportation to eating, individuals are accustomed to utilizing the administrations of computerized organizations. Taherparvar et al. (2014) conceded that banking would follow how online business works with the ongoing improvement of advanced innovation. This is to address the issues of clients who are so quick today. "Later on, banking patterns will follow internet business," The bank clients will never again have to go to the bank to see adjustments, yet in addition to all exchanges in the record book, which should be possible from home (Gilchrist, 2016).

More efficient performance appraisal

It supports the learning process, but technological advances also help teachers know their students' progress. Through special software, a teacher can give and receive student assessments simultaneously. Assessment is an instructive part completed by teachers to understudies to figure out the turn of events and progress of understudy learning results (Farr et al. 2013). Withdrawing from the legitimate umbrella of training, we realize that assessment implies surveying what has been instructed, and the consequences of the evaluation are utilized as a venturing stone to proceed with additional schooling. In a hadith described by Muslims, the Messenger of Allah once tried his capacities when he was going to

leave for battle as the accompanying portrayal: told Muhammad ibn Abdullah ibn Numair, let us know dad, let us know Abdullah, from Nafi, from ibn Umar, said, "The Messenger of Allah SAW tried my capacity to battle upon the arrival of the skirmish of Uhud, when I was fourteen years of age, then, at that point, he would not permit me, and they tried me once more upon the arrival of the clash of Khandaq when I was fifteen years of age, then, at that point, he permitted me" (HR. Muslim).

Discussing assessment implies discussing the process. What is more, completing the interaction requires careful arrangement by teachers. Each teacher is expected to make a learning arrangement as a Learning Implementation Plan, which should be adjusted to the current prospectus (Bhosale & Kulkarni, 2013). The educator utilizes the illustration plan as an aid in instructing. The illustration plans contain learning goals, topics, strategies, media, movement steps, and evaluations. Instructors should make illustration arrangements for every material to be educated because without direction, the educator will be confounded and bewildered in doing their obligations. So, the learning system should be completed as per the RPP made (Ferreira-Oliveira et al., 2018, March).

Instructors should likewise plan media as the conveyance of educating understudies. This learning media can be print, sound, or general media, for example, recordings connected with figuring out how to be instructed (Daoanis, 2012). Media utilization should be adjusted to the instruction material so it is proper and does not stray from the learning goals. Besides the media, the instructor should likewise set up an evaluation instrument to gauge learning accomplishment. For appraisal, teachers should likewise change the inquiries given to the learning targets to be accomplished. Since the execution of the 2013 educational program, the appraisal has been innovation-based. They are beginning from the mid-semester tests to the public tests even though they are PC-based. If the public authority has chosen the public test, the local government chooses it for the mid-semester and end-semester tests, and the school chooses some (Meng & Zhang, 2022).

Typically, neighborhood state-run administrations just give power to schools to decide their particular evaluation instruments. Since not all schools are prepared to complete innovation-based tests, notwithstanding the utilization of innovation in evaluation, chiefs and instructors should likewise allude to graduate ability principles in deciding appraisal instruments in their schools, which are mental, full of feeling, and psychomotor arranged (Hemati & Mardani, 2012). The ability of full of feeling graduates (mentalities) is to have conduct that mirrors the demeanor of devotees, have respectable person, is inevitable, and is answerable for cooperating successfully with the social and regular habitat. At the same time, mental alumni can have genuine and theoretical information in science, innovation, craftsmanship, and culture with knowledge of humanity, ethnicity, state, and progress connected with peculiarities and occasions in the general climate. This software helps teachers to know the progress of their students. Starting from the number of assignments given to how long it takes students to answer a question. That way, the teacher can know what to do with each student (Laguador, 2013).

Teachers have now become professionals

Teachers were often paid inadequately in the past, so they were dubbed the unsung heroes. However, thanks to technology, teachers can become professionals by getting certified. Apart from upgrading teachers' degrees, this certification also helps teachers prepare students for an ever-changing industry (Dias-Trindade et al., 2020). Interestingly, changes in the climate outside the universe of instruction, from the social, monetary, and mechanical to worlds of politics, require the universe of training to reexamine how these progressions influence a social foundation and how to associate with these changes. One of the natural changes that extraordinarily influence the universe of schooling is the presence of data innovation. Data innovation is a way for media clients to impart what they need to pass on to others. Data clients can be both awful and fantastic. The significant effect is that we can get a ton of data from refined innovation that has arisen as of late. The terrible effect might be that numerous others misconstrue innovation, so it is utilized inaccurately (Bond et al., 2020).

The job of data innovation in human exercises right now is for sure exceptionally enormous; mechanical improvements have affected the universe of instruction, particularly in the learning system. Practical learning exercises require media that upholds the ingestion of as much data as expected (Gudmundsdottir & Hatlevik, 2018). Alongside the times, innovation assumes a significant part as a way to get it being educated to learn the material. Innovation and learning media are one of the backings that assume a significant part to work on the nature of HR in the learning system. The adequacy of the education and learning process is firmly impacted by the strategies and learning media utilized, which are all interrelated, where a specific determination will influence what kind of media will be utilized. As there should be a match between the two to acknowledge learning goals, the game plan of learning completed by an educator is impacted by the media utilized (Bullock, 2013).

The presence of media in learning is additionally supposed to have the option to assist with expanding understudy understanding, present data all the more alluringly and dependably, work with information translation, and consolidate data (Vargo et al., 2021). So, for this situation, it is said that innovative media can aid the most common way of moving information or data in learning. Things that should be considered in dealing with a class given innovation are significant for instructors when they believe that learning right now is not just centered around PC innovation, even though, as of now, PCs are one of the devices that are being inclined toward by schools in supporting kids' exercises at school. Different devices can likewise be utilized in completing learning exercises and as instruments, and for specific learning, exercises embraced by understudies like phones, innovation recordings, radio, and others (Howard & Mozejko, 2015).

Innovation in the homeroom works with learning exercises that should be passed by understudies and gives comfort to instructors during the time spent moving information to their understudies. Hence, the homeroom climate should offer help with learning exercises that make understudies and educators happy with instructing. Each instructor maintains that his understudies should have the option to learn and find lasting success in learning; the outcome in understudy

learning will rely upon the endeavors of the educator to give bearings and give help with these learning exercises. With the distinctions that understudies have, innovation permits people to be completed without limit (Bond et al., 2018).

E-books make it easier for students to find references

The presence of e-books makes it very easy for students to find references. Besides being easy, students also do not have to bother carrying thick books to school or doing assignments. This electronic book which usually comes in PDF format, also allows students to study anywhere (Raynard, 2017). Learning media has started to be utilized by the local area, including instructors and understudies. Digital books are a powerful medium for learning. Clients like instructors and understudies feel the capacities and advantages of E-books. Plays the part of the E-book been felt for instructors and understudies? Digital books have turned into a famous learning medium because the public authority ultimately upholds the utilization of digital books in learning. Digital books assume a significant part in the learning system since they enjoy the benefits. The upsides of E-books should be visible from the capacities and advantages. The clients see the weaknesses of the E-book in every locale (Alhammad & Ku, 2016).

A portion of the elements of E-books as learning media is to increment learning efficiency. The gaining system cannot be isolated from learning assets through perusing books, for example, digital books. Digital books are likewise a limitless reference, so they are not focused on one learning asset. Digital books assist instructors with endlessly smoothing out learning time (Walton, 2014). Teachers are annoyed on the off chance that they need to convey a great deal of perusing books in their actual weighty structure. Digital books as computerized information are elementary to convey in many documents, with the goal that instructors do not run out of learning materials for understudies. Digital books can lessen the weight of teachers in introducing data; the data given through digital books are more concrete and permits individual learning since it does not rely upon the data given by instructors, understudies can get the hang of as indicated by their necessities, capacities, abilities and interests, learning is more coordinated, can give direct information on the aftereffects of perusing, permits the arrangement of more extensive data to understudies (Larson, 2015).

The advantages of E-books when seen from their actual structure as computerized information are actual petite sizes since they can be put away in information capacity like blaze drives, etc., digital books are additionally not out of date like customary books, computerized arranges to endure forever with an unaltered organization (Raynard, 2017). Digital books are likewise intelligent learning media in conveying data since they can show sight and sound representations. Digital books massively affect mechanical heads' ways of training. For an instructor, it is significantly helped by the presence of an E-book with extra comforts. Teachers will find it simpler to observe the causes of a topic and add references to learning assets. Instructors do not have to move from one spot to another, which sits around idly because E-books can be acquired from sites; they need to sit and look with web access. Digital books can be yelled at as a Hero for the outcome of showing instructors they are productive and successful (Martin & Quan-Haase, 2013).

E-books are likewise exceptionally supportive for the learning system outside the study hall or at home for understudies. Understudies who have web access at home can download E-books from the web page or search with the expectation of complimentary web access in areas of interest. Qualities of understudies eager for information make the material conveyed by teachers lacking; it may be undifferentiated from vegetables without salt (Larson, 2015). Digital books assume a part as supporting extra information material; E-books become salt in vegetables. Information on understudies will be more complicated than the utilization of E-books. The Ministry of National Education gives digital books under the name Electronic School Books, which are gotten to utilizing Adobe Reader programming, and so on. Digital books are currently evolved by scientists or software engineers with a combination of different mixed media like enlivened pictures and sounds. Digital books, which by and large consist of composing, are incorporated with audiovisuals to make them more intuitive. Digital book clients will be more intrigued and can get the substance of the material without much of a stretch (Lee, 2013).

There is a significant hindrance in the rush hour gridlock of our data. These requirements are connected with the extreme divergence between conditions in the locales and the middle (Staiger, 2012). As of now, individuals in substantial urban areas can appreciate free internet providers with not much access to valuable open doors. In the meantime, individuals on the edges who are monetarily less ready to serve themselves in light of their powerlessness financially are additionally confounded by the state of data benefits that are not smooth. If they need to get to BSE, which is allowed to download, somebody who is nearby should pay more than purchasing a printed book. Such imbalances frequently position the little local area as casualties of different projects not planned as expected (Doiron, 2011).

Online learning allows students to be personalized

The internet is a bridge for students to take online classes. The emergence of online class sites allows students to learn foreign languages with native speakers through video conferencing. In addition to learning foreign languages, students can also learn about various cultures through social interactions in online classes. The possibility of regular tutoring has changed lately. Being present in the review corridor is no longer the primary learning decision - not with the web methodology and new progressions (Dyer et al., 2018). Therefore, using a web-based tutoring stage considers an overall concordance among work and survey, so there is a clear explanation to relinquish anything. Focusing on web-based shows central time use capacities, making finding a fair work focus on balance more direct, and having a typical arrangement among students and teachers can encourage the two players to recognize new liabilities and have more autonomy (Klašnja-Miličević et al., 2011).

Technology Digital offers a wide selection of learning tasks

There are endless capacities and subjects to train and learn in a space as vast as the web. A steadily expanding number of universities and schools of higher learning are presenting on the web variations of their ventures for a vast extent of

levels and trains. From melodic design to quantum actual science, there are opportunities for every student. Focusing on the program online is an unprecedented decision for securing a power announcement, acknowledgment, or degree without going to a school ground. Online guidance licenses us to acquire or instruct from wherever in the world. This infers convincing explanation need to drive beginning with one spot then onto the following or follow an inflexible plan (Holland & Holland, 2014).

Similarly, people save time, yet what is more, saved cash can be used for various necessities. Virtual review corridors are open anyplace as long as there is a web affiliation, and a remarkable technique for taking advantage of it is to travel. For example, web-based tutoring is a fantastic choice if they think abroad and have to get another profession. There is no undeniable clarification to giving up work or study while exploring new and bright spots. Thinks about a changed an open door for development (Goldie, 2016).

Before, we referred to how flexibility can help us set our own learning pace. However, internet preparation is versatile for each student's particular necessities and limited level (Bandyopadhyay & Sen, 2011). Online classes will commonly be more unassuming than typical class sizes. As a general rule, online learning stages grant a solitary student at a time, and in basically all cases, this thinks about more conspicuous affiliation and more contribution among our mentor and us. As often as possible, there is permission to incredibly unique material like accounts, photos, and advanced books online as well, and tutors can, in like manner, integrate various arrangements, for instance, social affairs or discussions, to redesign their delineations. Additionally, this extra cheer is available at whatever point from wherever, which will offer us all the more remarkable and altered tutoring (Collins & Halverson, 2018). More monetarily adroit than ordinary tutoring.

Not in any manner like very close tutoring systems, online guidance will overall be more sensible. There are, furthermore, often unique portion decisions that grant us to pay in segments or per class. This considers the board's better spending plan. We may be obligated to cut off points or awards, so the expenses are only sometimes high (Collins & Halverson, 2018). They can similarly get a fair arrangement on development and class materials, which are habitually available for no good reason. The cash-related hypothesis is minor with everything taken into account, yet the benefits can be ideal over various decisions. These are two or three inspirations to pick web-based tutoring and why 90% of the current students accept that web learning is comparable to or better than the standard review lobby insight. Each student ought to assess their exceptional conditions and pick according to their necessities and goals, and remember that this choice rather than legal guidance is not great for everyone; it is at this point a supportive decision with essentially huge decisions for worldwide students all around the planet (Collis & Moonen, 2012).

Conclusion

This final section will summarize the main points that we have obtained from a series of literature reviews related to innovative educational transformation

technologies and present educational solutions disrupted by the pandemic. We believe that these points are valid findings obtained from previous studies. We believe this finding has answered the research question from a non-field study that questions the extent to which technology can provide change and is also a solution when academics hit the world, especially the development of point education, so here we describe essential points, including the reasons why digital learning applications are efficient, including student and the teacher can no longer meet in class. However, with this technology, they can meet remotely. The next point is that we are also priced to see that this digital learning application chat is more efficient, in the sense that it is not blaming the role of the teacher in face-to-face learning but on digital technology. This provides efficiency while helping teachers, and maybe relationship does not just break because of the pandemic.

The next point is an opportunity for both students and teachers where digital applications can provide a solution so that the first teacher can become more professional with the help of applications. Digital learning points and applications provide various features and others, such as electronic books, and allow students to obtain references from various discussion topics; the next point is that with the digital. This online learning application is no longer a problem. Online learning assisted by digital applications, learning will become more personal and independent for students and point teachers, as well as digital applications that provide opportunities and opportunities for students to complete various tasks and faith, where the teacher gives assignments online and does not expect students to have to work at the same time but allows students to do it at other times as long as they are on time.

These are the essential points that we have summarized from a series of reviews on various literary topics. We hope that this study will be helpful in the development of similar studies in the future. We also hope for input and improved feedback for the perfection of our studies in the future.

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References

- Abel Jr, A. (2020). The phenomenon of learning at a distance through emergency remote teaching amidst the pandemic crisis. *Asian Journal of Distance Education*, 15(1), 127-143.
- Agarwal, A., Pitso, I., & Dintwa, E. (2020). Implementation of integrated E-learning and microteaching in engineering: A case study of the University of Botswana. *Journal of Education, Teaching and Learning*, 5(2), 409-414.
- Alamleh, E. J. S. (2019). *Applying TPACK to Foster Dynamic Language Acquisition in an ESL/EFL Classroom: A Systematic Review*.

- Alhammad, R., & Ku, H. (2016). Graduate students' experiences and attitudes toward using e-books for college-level courses. *Journal of Educational Research and Innovation*, 5(2), 1.
- Anastasiadis, T., Lampropoulos, G., & Siakas, K. (2018). Digital game-based learning and serious games in education. *International Journal of Advances in Scientific Research and Engineering*, 4(12), 139-144.
- Autio, E., Nambisan, S., Thomas, L. D., & Wright, M. (2018). Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, 12(1), 72-95.
- Bandyopadhyay, D., & Sen, J. (2011). Internet of things: Applications and challenges in technology and standardization. *Wireless personal communications*, 58(1), 49-69.
- Bdair, I. A. (2021). Nursing students and faculty members' perspectives about online learning during COVID-19 pandemic: A qualitative study. *Teaching and Learning in Nursing*, 16(3), 220-226.
- Bhosale, G., & Kulkarni, R. (2013). Role of fuzzy techniques in performance appraisal of teaching staff. *International Journal of Latest Trends in Engineering and Technology (IJLTET)*, 139-142.
- Bikowski, D., & Casal, E. (2018). Interactive digital textbooks and engagement: A learning strategies framework. *Language Learning & Technology*, 22(1), 119-136.
- Bond, M., Marin, V. I., Dolch, C., Bedenlier, S., & Zawacki-Richter, O. (2018). Digital transformation in german higher education: Student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education*, 15(1), 1-20.
- Chucks, E., Sani, Y., & Moses, T. (2020). A review of information and communication technology (ICT) facilities for implementing a virtual library management system. *International Journal of Scientific and Engineering Research*, 11, 448-460.
- Collins, A., & Halverson, R. (2018).
- Collins, A., & Halverson, R. (2018). *Rethinking education in the age of technology: The digital revolution and schooling in America* Teachers College Press.
- Collis, B., & Moonen, J. (2012). *Flexible learning in a digital world: Experiences and expectations* Routledge.
- Daoanis, L. E. (2012). Performance appraisal system: It is the implication to employee performance. *International Journal of Economics and Management Sciences*, 2(3), 55-62.
- Dias-Trindade, S., Moreira, J. A., & Ferreira, A. G. (2020). Assessment of university teachers on their digital competencies. *Qwerty-Open and Interdisciplinary Journal of Technology, Culture, and Education*, 15(1), 50-69.
- Doiron, R. (2011). Using e-books and e-readers to promote reading in school libraries: Lessons from the field. Paper presented at the *IFLA Conference*, 13-18.
- Dyer, T., Aroz, J., & Larson, E. (2018). Proximity in the online classroom: Engagement, relationships, and personalization. *Journal of Instructional Research*, 7, 108-118.
- Farr, J. L., Fairchild, J., & Cassidy, S. E. (2013). Technology and performance appraisal. *The Psychology of Workplace Technology*, 77-98.
- Ferreira-Oliveira, A. T., Fernandes, S., & Santos, J. (2018). Performance appraisal of higher education teachers' in information systems and technology: Models,

- practices, and effects. Paper presented at the *World Conference on Information Systems and Technologies*, 399-404.
- Flew, T. (2018). Post-globalisation. *Javnost-the Public*, 25(1-2), 102-109.
- Galanakis, C. M., Rizou, M., Aldawoud, T. M., Ucak, I., & Rowan, N. J. (2021). Innovations and technology disruptions in the food sector within the COVID-19 pandemic and post-lockdown era. *Trends in Food Science & Technology*, 110, 193-200.
- Gilchrist, A. (2016). *Industry 4.0: The industrial internet of things* Springer.
- Goh, P., & Sandars, J. (2020). A vision of the use of technology in medical education after the COVID-19 pandemic. *Mededpublish*, 9(49), 49.
- Goldie, J. G. S. (2016). Connectivism: A knowledge learning theory for the digital age? *Medical Teacher*, 38(10), 1064-1069.
- Helbing, D. (2019). The digital revolution's societal, economic, ethical, and legal challenges: From big data to deep learning, artificial intelligence, and manipulative technologies. *Towards digital enlightenment* (pp. 47-72) Springer.
- Hemati, M., & Mardani, M. (2012). Designing a performance appraisal system based on balanced scorecard for improving productivity: A case study in Semnan technology and science park. *Management Science Letters*, 2(5), 1619-1630.
- Himanen, L., Geurts, A., Foster, A. S., & Rinke, P. (2019). Data-driven materials science: status, challenges, and perspectives. *Advanced Science*, 6(21), 1900808.
- Holland, J., & Holland, J. (2014). Implications of shifting technology in education. *Tech trends*, 58(3), 16-25.
- Howard, S. K., & Mozejko, A. (2015). Teachers: Technology, change, and resistance. *Teaching and Digital Technologies: Big Issues and Critical Questions*, 307-317.
- Klašnja-Miličević, A., Vesin, B., Ivanović, M., & Budimac, Z. (2011). E-learning personalization is based on a hybrid recommendation strategy and learning style identification. *Computers & Education*, 56(3), 885-899.
- Krishnamurthy, S. (2020). The future of business education: A commentary in the shadow of the covid-19 pandemic. *Journal of Business Research*, 117, 1-5.
- Kumar, A., Vengatesan, K., Rajesh, M., & Singhal, A. (2019). Teaching literacy through animation & multimedia. *International Journal of Innovative Technology and Exploring Engineering*, 8(5), 73-76.
- Kusumawardhani, P., & Nurhayati, N. (2019). The analysis of teaching writing to young English learners (EYL) through a movie: An ICT perspective. *Wanastra: Jurnal Bahasa Dan Sastra*, 11(1), 25-36.
- Laguador, J. M. (2013). Engineering students' academic and on-the-job training performance appraisal analysis. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 3(4), 301.
- Larson, L. C. (2015). E-books and audiobooks: Extending the digital reading experience. *The Reading Teacher*, 69(2), 169-177.
- Lee, S. (2013). An integrated adoption model for e-books in a mobile environment: Evidence from South Korea. *Telematics and Informatics*, 30(2), 165-176.
- Mangal, S., & Mangal, U. (2019). *Essentials of educational technology* PHI Learning Pvt. Ltd.
- Mardiah, H. (2020). The use of E-learning to teach English in the time of the covid-19 pandemic. *English Teaching and Linguistics Journal*, 1(2), 45-55.

- Martin, K., & Quan-Haase, A. (2013). Are e-books replacing print books? Tradition, serendipity, and opportunity in adopting and using e-books for historical research and teaching. *Journal of the American Society for Information Science and Technology*, 64(5), 1016-1028.
- Meng, S., & Zhang, X. (2022). The use of the internet of things and cloud computing technology in the performance appraisal management of innovation capability of university scientific research team. *Computational Intelligence and Neuroscience*, 2022.
- Nah, F. F., & Siau, K. (2020). Covid-19 pandemic—the role of technology in transforming the business to the new normal. Paper presented at the *International Conference on Human-Computer Interaction*, 585-600.
- Raynard, M. (2017). Understanding academic e-books through the diffusion of innovations theory as a basis for developing effective marketing and educational strategies. *The Journal of Academic Librarianship*, 43(1), 82-86.
- Raynard, M. (2017). Understanding academic e-books through the diffusion of innovations theory as a basis for developing effective marketing and educational strategies. *The Journal of Academic Librarianship*, 43(1), 82-86.
- Sheth, J. (2020). Impact of covid-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research*, 117, 280-283.
- Staiger, J. (2012). How e-books are used: A literature review of the e-book studies conducted from 2006 to 2011. *Reference and User Services Quarterly*, 51(4), 355-365.
- Taherparvar, N., Esmaeilpour, R., & Dostar, M. (2014). Customer knowledge management, innovation capability, and business performance: A banking industry case study. *Journal of Knowledge Management*.
- Tidd, J., & Bessant, J. R. (2020). *Managing innovation: Integrating technological, market, and organizational change* John Wiley & Sons.
- Urbinati, A., Chiaroni, D., Chiesa, V., & Frattini, F. (2020). The role of digital technologies in open innovation processes: An exploratory multiple case study analysis. *R&D Management*, 50(1), 136-160.
- Vargo, D., Zhu, L., Benwell, B., & Yan, Z. (2021). Digital technology use during COVID-19 pandemic: A rapid review. *Human Behavior and Emerging Technologies*, 3(1), 13-24.
- Walton, E. W. (2014). Why do undergraduate students choose to use e-books? *Journal of Librarianship and Information Science*, 46(4), 263-270.
- Wolfswinkel, J. F., Furtmueller, E., & Wilderom, C. P. (2013). Using grounded theory as a method for rigorously reviewing the literature. *European Journal of Information Systems*, 22(1), 45-55.
- Wu, B., Piatkevich, K. D., Lionnet, T., Singer, R. H., & Verkhusha, V. V. (2011). Modern fluorescent proteins and imaging technologies to study gene expression, nuclear localization, and dynamics. *Current Opinion in Cell Biology*, 23(3), 310-317.