

Public Libraries in the Post-COVID-19 Era: How to Transform Educational Services to Meet New Educational Needs

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ABSTRACT

The COVID-19 pandemic created a new reality for the educational sector in both formal and informal institutions. Educators in the UAE continued to offer classes and to communicate with their students virtually. Libraries, too, were able to continue to offer their educational services and provide free access to their digital environment for all ages around the public and private schools and universities. Technology has the potential to continue offering more advanced services to both universities and libraries. These services can be reimagined and introduced according to the new needs and demands after the pandemic and through business concepts. This paper explores the teachers' and librarians' perceptions on collaborating together within a common smart pedagogical approach, and the possibility it carries to improve the quality of their educational services. A case study was conducted in one of the library's chain in the UAE to explore how smart technologies can promote productive collaboration between formal and informal education.

KEYWORDS

21st Century Skills, Customer Service, Disruptive Technologies, Public Libraries, Smart Education

INTRODUCTION

The impact of the COVID-19 pandemic has been shown to affect many sectors. Since its outbreak, it has not only disrupted economic and social life, but also the educational sector (Al-Hamad et al., 2021; Aristovnik et al., 2020; Erfurth & Ridge, 2020; Tarkar, 2020). The sudden spread of the pandemic required new quick emergency decisions that would help to continue with basic life needs. Those needs were primarily focused on health and education (Plancher et al., 2020).

Prior to COVID-19, many educational institutions in the United Arab Emirates (UAE) had invested in distance learning and educational technologies; however, adopting these new trends in education was slow and did not match the heavy investments spent on these types of learning styles (Daouk & Aldalaïen, 2019). The UAE, however, has invested in a new digital platform called Mohammed Bin Rashid Smart Learning Program, which was launched in 2012 and allowed teachers and students to enjoy the benefits of the smart classes even before the pandemic (Bawa'aneh, 2021; Ministry of Education, 2018). Moreover, Hamdan Bin Mohammed Smart University (HBMSU), which was established in 2002, is the first accredited e-learning academic institution by the Ministry of Education (MOE) in the UAE, and the UAE is the first country in the Gulf Cooperation Council (GCC) to join

DOI: 10.4018/IJCRM.306247

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the International Council for Open and Distance Education (ICDE) (Hamdan Bin Mohammed Smart University, n.d.). Thus, the culture of e-learning was not totally new to the K-12 students in general education and to some students in higher education.

In March 2020, the UAE implemented distance learning. Technology was the savior for formal learning systems to continue offering their educational services (Bawa'aneh, 2021). On the other hand, countries that were not prepared, either with technology or quick leadership decisions, had to completely stop formal education classes, which caused a loss in time and opportunities of improving 21st century skills of their youth (Bozkurt et al., 2020).

Similarly, public libraries in the UAE closed their premises during COVID-19 and continue some of their services remotely (Khaleej Times, 2020; The National, 2020). Those services were mostly providing digital content, virtual awareness programs, educational sessions, and afterschool programs. Some libraries offered free access to their digital content using services like *Sharjah Libraries* and *Abu Dhabi Libraries*.

Thanks to technology, the access to almost all services provided by federal institutions in the UAE is possible. Education, on the other hand, is going through a huge disruption due to the phenomenal growth in emerging technologies and the innovations that educators and researchers are creating through research. This disruption is comparatively generated by easy accessibility to knowledge via the Internet, the interconnectivity between various gadgets (Internet of Things), the availability of empirical data concerning learner's progress (big data and analytics), and the uncomplicated co-creation of knowledge. This extent of educational disruption has various implications on the nature and outcomes of learning.

The COVID-19 pandemic suddenly created a new reality for the educational sector. Although this reality was a challenge, it was also an opportunity to explore the potential of developing a collaborative system that unifies all efforts in schools and libraries to provide a better educational service for their customers. Since these two formal and informal learning institutions (i.e., schools and public libraries) share the same values of spreading knowledge and life-long learning habits, this study is an attempt to explore the edu-cultural dimension of a possible collaborative relationship between formal and informal education stakeholders and the potential it can carry for both sectors from a business perspective. It can create an opportunity for start-ups to provide innovative educational services that are designed specifically to bridge the gaps between schools and libraries. This paper investigates a way for a rewarding partnership to both institutions that fosters acquiring new knowledge and skills that would address 21st century demands and challenges.

BACKGROUND

Cuban and Cuban (2007) stated that the potential that both domains (i.e., schools and libraries) can bring to the educational field come from the similarities they have: They are both considered as environments for learning (i.e., resources and technologies), and they are both considered as conduits or agents for life-long learning (i.e., engaging dialogs, negotiations, and community renewal). Moreover, both institutions can rearrange learners as families and individuals.

It is therefore possible to establish a partnership between schools and public libraries by using smart learning physical and virtual environments, as well as similar pedagogical approaches. Problem-based and project-based learning can be used as pedagogical approaches in public libraries' activities that are based on schools' curriculum. In this case, the students do not stop acquiring knowledge, rather they continue to practice it in different ways and share their findings with schoolmates through digital networks. In this case, technology disrupts the way students learn by creating smart learning environments in physical and virtual spaces.

Disruptive Pedagogy for Online Learning

Problem-based learning and Project-based learning are two pedagogies stems from constructivism theory in education. They are well known in both formal and informal education in physical settings. However, they can further be investigated to determine the feasibility to apply them for online learning.

Problem-based learning is a practical approach that enables students to use their knowledge by addressing real-life problems. It gained its popularity from adult learning and medical colleges that adopted this approach after witnessing its effectiveness in physicians' performances (Schmidt, 1983).

Although problem-based learning has been implemented in the school curricula in North America and Europe for more than thirty years (Savery, 2006), the debate of the superiority of problem-based learning over traditional learning is still active (Sanson-Fisher & Lynagh, 2005). Problem-based learning is effective for knowledge retention and for preparing students for different challenges or situations that they may encounter in real life (Pease & Kuhn, 2010). This type of learning can be applicable in disciplines such as medicine, art, science, and other areas where the students need to practice their skills to solve a problem using their knowledge or others in a collaborative learning environment (Savery, 2006). Other subjects, such as history and languages, are challenging to be entirely instructed over problem-based learning. Moreover, the collaborative component in problem-based learning cannot always significantly differ in students' learning (Pease & Kuhn, 2010). This indicates that problem-based learning still has gaps that need to be addressed by research. However, even if these gaps cannot be completely filled, a combination of different approaches in different settings (formal/informal) is what this study aims to explore further.

Project-based learning, on the other hand, is a student-centred approach that enables students to learn by doing projects. There is empirical evidence on the role of project-based learning in improving students' performances (Bell, 2010; Blumenfeld et al., 1991; Gültekin, 2005; Ozdener & Ozcuban, 2004; Scarbrough et al., 2004). Bell (2010) argued that, by implementing project-based learning, students are ready to meet the 21st century with enough preparation and a combination of skills to use successfully.

Figure 1. The components supporting a problem or task team (Moursund, 1999)

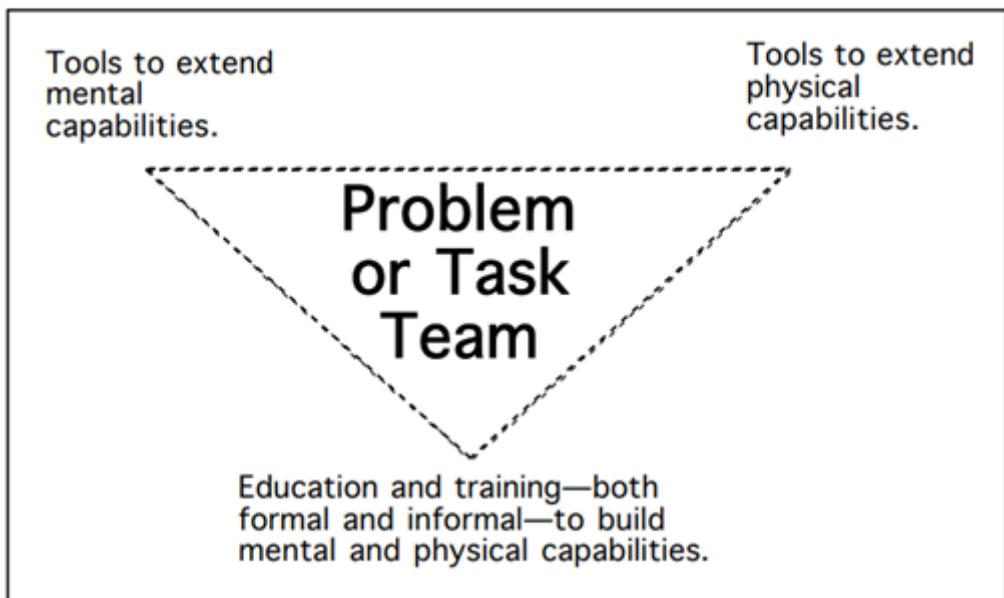


Figure 1 illustrates a substantial element linked to this research. Moursund (1999) stated that one of the main categories on which problem or task team learning (P/T Team) depends is the formal and informal educational system, which provides the necessary support to the team members to build and improve their mental and physical competencies. This category acts as the hub where other categories find a way to emerge and be of use. Other categories are the tools that support mental competencies, such as computers, libraries, and the Global Digital Library; he called these tools the “mind tools.” In addition, some tools support physical competencies, such as airplanes, automobiles, microscopes, telescopes, telephones, and the World Wide Web. He also considered education and training, as opposed to knowledge and skills, as being built-up in an overlapping process in formal and informal educational settings.

As Dewey (1998) argued, “extremes cannot be acted upon And, when it comes to practical matters, circumstances compel us to compromise” (p. 1). It may not be compulsory for schools to combine Moursund’s (1999) categories inside the formal system in a way that may burden teachers with the ever-changing requirements. Instead, it can be worth trying to identify and accept the limits of both (formal and informal), then combine some features of both to meet mutual goals. This may lead to shared responsibilities between libraries and schools regarding any educational goals, challenges, or consequences. This kind of sharing can be achieved by looking at common threads, as a start, to create a holistic approach that accomplishes bigger objectives. The use of public libraries, museums, and other informal learning environments, from this holistic sense of building knowledge and skills together, is logical and should be further encouraged.

Moursund’s (1999) framework also suggests that the best approaches to take with project-based learning are IT-based learning tools. Technology is driving changes in many fields to the extent of disruption, and the education field is not an exception. In the following section, the authors will discuss the norm and model of disruptive technology and its relation to the learning spaces.

Disruptive Technologies

Clayton Christensen was the first to use the term “disruption innovation” in the middle of 1990s. The term refers to small companies, or startups, with fewer resources, that enter the market and compete with the existing established incumbent business. Although the product is not as good as when it was first produced and at first targets the overlooked minority of customers, it improves gradually and attracts the mainstream customers, which eventually leads to taking over from the existing product (Christensen et al., 2015).

Figure 2. The disruptive innovation model (Christensen et al., 2015)



Figure 2 shows where the products of both incumbent companies and the entrants (or new startups) exist in the market. The incumbent companies introduce high-quality products or services that target the high-end market with a higher rate of profitability. The entrants, on the other hand, target the overlooked segment of customers by providing more affordable products with a lower rate of profitability. The blue lines indicate the willingness of the customers to pay for the products. In time, the entrants improve the quality of their products and challenge the dominance of the incumbents (Christensen et al., 2015).

This does not mean that incumbent companies should be threatened whenever a new entrant fills a gap in their area. They should be always alert and keep up with the new demand and changes especially with technologies, but should sustain, at the same time, the profitable business and continue to reinforce relationships with their main customers (Christensen et al., 2015).

Disruptive Innovation

Another term Christensen (1997) coined was “the innovator’s dilemma.” The term refers to the technology that emerges in the market, targets a limited cluster of customers, in time takes over, and becomes the base tool of people’s routine tasks, such as computers, tablets and smart devices, mobile phones, social networking, and email.

Christensen (1997) argued two factors play roles in leading companies to fail or thrive: Decision-making and the resource allocation process. Successful managers work on projects that commercialize disruptive technologies that target the right customers; they develop disruptive technologies in small groups to gain small wins; their work is based on trial and learning from failure in their early stages; they utilize resources to address the disruption without leveraging the organization’s process and values; they develop new markets to commercialize disruptive technologies to compete as sustaining technologies in mainstream markets (Christensen, 1997).

Disruption in Education

Like the above concepts, disruption in education mainly refers to the types of learning that uses technological tools in a way that is not familiar or known before. Social media, blogs, and virtual platforms, for example, are disruptive tools in education. In addition, it is the educational institutions’ decision to take the challenge to ensure learners participate critically with the innovative technologies, by framing questions, helping the learners to develop their intellectual skills and critical analysis, and by fitting this learning process into the institutional structure (Kop, 2007).

Disruptive transformation in education, however, goes into the hybrid phase, where a combination of new disruptive technology is used with the old one, and where the target is the existing learners. An example of a hybrid model in education is blended learning, which uses the advantage of online learning with the traditional classroom. Examples of hybrid learning are: Flipped classroom, lab rotation, and the station rotation, while the flex and enriched virtual and individual rotation models are disruptive models of blended learning (Christensen et al., 2013).

One of the disruptive tools is open educational resources, which is educational material in any medium – digital or nondigital – that is in the public domain, or has an open license for free access with no or limited restrictions. Open educational resources form part of “open solutions,” beside free and open source software, open access, open data, and crowdsourcing platforms (UNESCO, 2021).

Public Libraries as Disruptive Learning Spaces

In the U.S., public libraries are appreciated for three reasons: The open-access information, the public spaces, and the power of circulating stories that help readers understand the world better (Pressley, 2014). It seems that IT empowerment was a turning point for libraries that needed more than just books to attract the public to its services, and as a result, will increase the chance to form divers and autonomy community (Aabø et al., 2010).

In 2014, Arts Council England published an evidence review of the economic contribution of libraries, which emphasized the social contribution of public libraries for children and young peoples' education and personal development, adult education, skills and employability, health and well-being, community support and cohesion, and digital inclusion. Moreover, the review pointed out that it was expected research would contribute more towards these aspects.

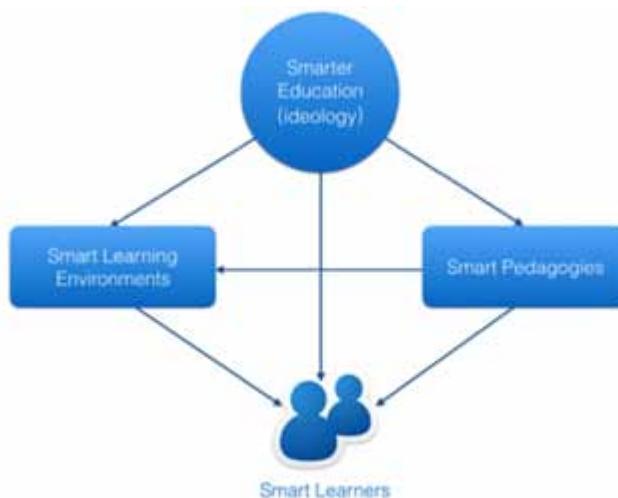
Smart Education and Smart Learning Environments

Smart education is distinguished from traditional education via the principle of proactive participation (Zhu et al., 2016). The smart learning environment provides more freedom to students to choose their learning resources, communicate with their peers and supervisors, and produce their work. Bado (2017) argued that the purpose of smart learning is to motivate the student to be an active member in the learning process and in the responsibilities of their learning outcomes. Bado conducted her study to identify the relationship between smart learning, creative thinking, and the most used tools by mathematics teachers. Her findings showed that learning in a multi-sensory environment is the best environment, since, when there is a combination of visual-aid information and a sense of touch, the brain responds quickly. Therefore, Bado suggested that “combining new material with previous knowledge and using multiple approaches in thinking will help in sustaining the effect of learning and then apply the results in other cases” (p. 365).

In Singh's (2001) study, WebClen, a smart learning project that provided an opportunity for students to produce collaborative work, provided direct access for parents to view their children's work through the Internet. Parents had easy access to the school virtually and were able to connect with the teachers without having to be physically present.

With regards to conceptualizing the emerging field of smart learning environments, Spector (2014) argued that “there has been relatively little strategic thinking about how best to plan and implement learning environments on a large and sustainable scale, and much too little attention to empirical research in this area” (p. 1). Therefore, smart learning is a paradigm that can allow examination and improvement of the tools of personalized learning, on-demand service, and open-source education if adopted and evaluated early enough. This research suggests that adoption in the educational field should be systematic and controlled to save time and effort and avoid the chaos that could result from misusing technology, such as mobile technology, the Internet of things, big data, and cloud technology.

Figure 3. Framework of smart education (Zhu et al., 2016)



The proposed model utilizes smart technologies and virtual environments in education. Zhu et al.'s (2016) framework consists of three elements that can be integrated into the model of this research:

- **Smart Environments:** Addressed as a technological issue.
- **Smart Pedagogy:** Addressed as a methodological issue, and it should be significantly influenced by smart learning design.
- **Smart Learner:** Is the ideal result of this process. The smarter learner is cultivated by smarter education.

Moreover, IBM has already created *Smarter Classroom*, which removes the barriers of time and space for students through a model that provides many benefits, such as reinforcing collaboration in an open learning environment through increasing access to resources and tools, a data environment that provides real-time information and strategies, open-source applications and content to enhance cost-effectiveness and interoperability, centralized services through devices that provide high functionality while reducing operational costs, and cloud-based services and infrastructure that are built on world-class technologies and integration services (Rudd et al., 2009).

Customer Service in Education

Nowadays, disruptive technology changes the way we learn things, and people can learn about almost any subject on the internet. However, in order to reach this level of autonomy and independency in learning, a guide or facilitator should be available from an early stage to make the learning journey effective. The learner would acquire the necessary skills that empower them to learn knowledge and contribute with their own in the future. These skills are life and career skills, learning and innovative skills, and information, media, and technology skills. These skills are called the 21st century skills (Battelle for Kids, 2019).

The increasing demand in the job market for more qualified university graduates has created opportunities for business providers (i.e., IT companies, business entrepreneurs) to constantly evolve their approaches. Their customers are educational institutions (i.e., schools, libraries, museums, educational centers) yet they all work toward the satisfaction of the end-user, who is the student. This reality has created more customer service behavior (CSB) in informal learning institutions, that enjoys more flexibility with “what” to provide and “how,” compared to schools that follow a curriculum within a limited timeframe.

Ryan and Ployhart (2013) defined CSB as any activity aimed to improve service quality, like welcoming, helping customers, or resolving problems. CSB also refers to the organizational behavior that involves management, coworkers, and customers, and where the employees must possess the motivation and the ability to perform the duties (Susskind et.al, 1999). In the 21st century, customers have become more authorized and more significant to organizational planning and strategy (Ryan & Ployhart, 2013). This customer-oriented approach has helped organizations study the factors which improve customer experience with services.

In the educational realm, customer service as a conceptual model is relevant to the informal educational context (i.e., libraries and museums) since the customer (or sometimes called patron) is not obliged to visit the library or the museum unless they wish to. The informal educational institutions in this case strive to constantly upgrade their services to ensure they have more loyal customers to their services.

Wueste and Fishman (2010) strongly argue that customer service as a business trend is not appropriate for the educational sector due to several shortcomings that may demoralize education and derail efforts to improve and sustain a culture of integrity. They propose an alternative model instead, which relies on values of professional practice, emphasizes the mutual dimensions of teaching and learning, and formulates the core principles of education.

The above argument was made in the formal education context (i.e., higher education) which follows specific national or international criteria to prepare students for graduation. Wueste and Fishman (2010) emphasize that higher education institutions ought to comply with a set of internal principles which determine the success of higher education. In order to achieve this success, students who are being served should make efforts as much as the teachers or academics who provide the service.

In the informal education context, public libraries can offer the services either directly through their employees, or through a third party. There is a room for integrating some business concepts to lure the customers to use their educational services, which can be considered as secondary services that support customers to reach their full potential and succeed in their formal education and future careers.

Customer service in education can also be perceived from another perspective. In the service business realm, Eisingerich and Bell (2008) believe that customer education increases trust. They encourage service companies to treat customer relationships as dynamic and evolving, and that companies also ought to build customers' overall level of competence. If this is to be projected in the informal education domain, public libraries can invest in their customers by educating them through dynamic and flexible means to deliver high service quality. This kind of investment leads to increased customer trust in public libraries, and therefore creates independent life-long learners.

PURPOSE OF THE STUDY

This study aims to reimagine the role of public libraries after the COVID-19 pandemic by exploring the future educational services from a business perspective. Creating smart learning spaces to improve educational service quality can contribute to meeting customers' needs and expectations. This new ambitious role may not be fully performed without a mutual understanding and collaboration between formal educational institutions (i.e., schools) and informal educational institutions (i.e., public libraries). The study aims to obtain teachers' and librarians' perceptions of such collaboration.

RESEARCH QUESTIONS

This study aims to answer the following questions:

1. What is the perception of librarians and teachers towards collaborations to improve their educational services?
2. What types of educational services are expected from public libraries to meet customers' future expectations after the COVID-19 pandemic?

METHODOLOGY

A case study was conducted in one of the library's chains in the UAE. The chain operates under a government cultural entity. The study also considers the teachers' perceptions who are working under the Ministry of Education in the UAE. Therefore, an electronic structured interview was administered to seven teachers in government schools and seven librarians in public libraries to gather their feedback on their experiences during the COVID-19 pandemic. They also shared their perceptions on the collaboration with the other educational institutions.

The interview was constructed based on the future services that can be provided in the public libraries and serve the schools' curriculum after the COVID-19 pandemic. Sets of questions were generated for two groups; teachers and librarians. The teachers' questions focused on "how" a collaboration can be implemented, and librarians' questions focused on "what" are the educational services to provide after the COVID-19 pandemic that meet the customers' expectations.

SAMPLE

Due to the lock-down caused by the COVID-19 pandemic, electronic interviews were conducted through emails. A sample size of seven teachers were randomly selected from a list provided by the UAE's MOE, with each teacher representing an Emirate from a total of the seven Emirates. As for librarians, one department of libraries in one of the Emirates was chosen. The department oversees a chain of libraries that provides services to government schools. The administration of the department nominated seven librarians to participate in the interviews. Those librarians heavily supervise the physical and virtual services in their libraries. The last interview was with the managing director of the libraries' department. The interviews took place from 12th of August 2020 to 1st of September 2020. The participants in the interviews preferred not to disclose their identities nor the names of the libraries for which they were working for. Nvivo software was used to conduct thematic content analysis to draw patterns and identify key concepts.

RESULTS

Teachers

All the seven teachers sustained that a virtual space can be connected to the MOE's learning management system (LMS) and digital libraries systems in public libraries. The purpose is to create a one-stop sign-in to access all the educational facilities in the virtual world. One teacher noticed that the success of such a step is conditioned to the classes-ratio per teacher, since virtual learning (or remote learning) has led teachers to hold additional responsibility in terms of preparation of lessons and following up with students' assignments, and more responsibility on the students as well to do their daily assignments. This situation can be a challenge that needs to be addressed further.

On the other hand, and under the vision of expanding the librarians' roles to be more of educational facilitators or teachers' assistants, two teachers highlighted the importance of training the existing librarians to handle this project or hiring newly qualified staff that are already specialists and ready to focus on this mission. Initiating partnerships with instructional designers, technical engineers, and private sector sponsors to be part of this project would help too.

As for the curriculum content, four teachers suggested developing a new holistic and engaging curriculum that is problem-based and project-based, integrated with school curriculum objectives, and that meets students' needs and interests with automated assessment, automated grading, and an awarding system. They suggested to include competitions that showcase and celebrate STREAM projects by talented students (gamification learning style). An inclusive curriculum can also be considered in which students with special needs may find a space to learn with their peers. One teacher suggested including "research skills" in the curriculum since this is one of the common goals between libraries and schools. Research skills require higher-order thinking skills (i.e., cognitive and analytical skills). Another teacher highlighted the importance of familiarizing the students with the "design thinking" process while working on their projects.

All the seven teachers believed that the virtual environment would help to improve the communication between librarians and teachers, especially after the COVID-19 pandemic, which had caused the closure of schools and public libraries. One teacher stated that some scientific experiments are hard to implement in real life, so students can easily use the high-tech facilities in virtual labs to practice and improve their skills. Another teacher affirmed that it would be more efficient to continue using virtual environments even after the pandemic would be over and schooling would be back to normal physical classes. Two teachers believed that the virtual environment would improve communication between librarians and teachers and between students and parents. Both also noticed that there was an improvement in the level of independence in students during the remote learning phase, and new talents and abilities, of those who were previously shy in physical classes, had progressively emerged more than before. Students were confidently participating in virtual classes to

prove themselves to their parents and teachers. They could also play the role of the teacher's assistant or instructor, instead of just being passive learners.

Two teachers suggested to build a virtual environment that is clear and user-friendly, supports both synchronous and asynchronous learning styles, supports group work between students, teachers, and librarians, supports reading and transferring different types of documents (i.e., MS files, PDF, and micro-media files), gives the students freedom to choose the activities they like, and has a shared archive to save their work and connect it to the formal MOE's LMS empowered with a secure back-up system.

In order to spread awareness about this project, four teachers recommended adopting a communication strategy that would promote and introduce this project first to the target audience/stakeholders (i.e., decision-makers, teachers, librarians, students, and parents) and convince them of the importance of mastering the new advanced electronic tools which aim to improve the students' 21st-century skills and meet schools' curriculum objectives at the same time. This could be through social media campaigns, meetings, and orientation sessions.

Librarians

All the seven librarians sustained that the virtual learning environment helped them reach out to more patrons than before, especially those outside the country, or who have no time to attend physical classes due to logistic challenges. They also said it cost less money and effort to run virtual classes than physical ones, and it was easier to communicate with their colleagues or patrons. The government entities were also more encouraged to partner with libraries to reach more audiences, since libraries' services had gotten more popular on the onset of the COVID-19 pandemic. However, they sometimes received too many requests, which could be overwhelming. On the other hand, they pointed out the existence of a few downsides to this environment. Due to the children's limited attention span, they sometimes get bored of the long hours behind the screen, especially when, as during the pandemic, they spend their schooling hours online. Therefore, they considered a balanced physical-virtual learning environment a better option. This boredom and attention span are also applicable to employees of the remote-working style in general. The long hours of electronic device usage can lead them to abandon library services. One librarian also highlighted that physical human interaction could not be replaced by virtual services all the time.

When comparing digital services to physical ones, in terms of quality, customer satisfaction, and the number of visits to the digital services, four librarians stated they are almost the same. One of them said the virtual services are better and more satisfactory. Two of them affirmed that the nature of virtual and physical services is different. Therefore, the comparison would not be fair. The only problem of virtual services is that it is hard to predict the number of attendees, whereas, in the physical environment, the number is predictable almost all the time (120-500 people), and sometimes parents attend to volunteer in organizing the physical events. Therefore, this human interaction is also lost in virtual activities.

All the seven librarians said that the most used services since the beginning of the pandemic were the digital library and the virtual workshops provided through social media live streaming. One librarian sustained that this has opened the door to librarians to pay more attention to improving and adding audio and video resources to their digital library to satisfy the increasing demand.

The learning process could be enriched through virtual platforms. Four librarians stated this could be done by organizing afterschool programs relevant to school tasks and improving 21st century skills. Three librarians said that this is possible with virtual courses on how to use digital resources and how to do research projects, and by improving patrons' listening and reading skills through reading clubs.

Managing Director

The managing director confirmed that it was not easy to transform the services given in the library into digital form. However, in only ten days, the management was able to propose the alternative

plans due to the librarians' positive sense of motivation and initiative, which allowed them to present the virtual workshops themselves. Four steps were taken into consideration. First, all librarians were asked to identify and stick to their tasks while working remotely in their homes, not to lose the sense of daily routine of work. Second, librarians were encouraged to start implementing their plans virtually. Third, librarians were encouraged to be flexible and easy with themselves to allow themselves to make mistakes from this new scenario caused by the pandemic. Finally, the leaders were granted the authority to do what they thought was best without getting back to their direct managers.

Other steps were taken: Transferring the reception lines to the librarians' cell phones to be able to attend to patrons' needs; keeping the communication channel with their patrons through the WhatsApp application to provide instant updates; utilizing different platforms to communicate with patrons; initiating a campaign to promote digital reading by granting free access to the digital library and organizing reading competitions; and finally, in case the requested reading material was not available in the digital form, the librarians were scanning the requested pages, as much as the laws of intellectual property permitted, and sending them to the patron's email.

According to the managing director, the virtual space can "definitely" help librarians reach out to more patrons. The pros of the virtual services, in her opinion, are that they are quick and easy to access, they are user-friendly, they save effort and time, and they are inclusive (i.e., people from outside the UAE could benefit from the service). Also, the library enjoys freedom in working separately (decentralized) yet providing their services to everyone.

The cons, on the other hand, are the lack of focus and distractions. Those distractions are: the background noise in the virtual classroom that disturbs the flow, the lack of physical movement, the lack of human interaction behind the screens, the threat of invading privacy, the overwhelming amount of educational/cultural services provided in the virtual space from unspecialized institutions, the isolation of the minority and overlooked segment which does not have Internet access to enjoy the virtual services, and the lack of electronic interaction protocol. However, the usage of virtual spaces was improved in the last six months.

The managing director maintained that building a collaborative system between libraries and schools can encourage students to be independent learners. However, in her opinion, a few points are worth considering, such as: Who will be the instructional designer for this program? How are the students going to follow it? How can this project be promoted in a way that is easy to understand by students, parents, supervisors, and teachers? How can libraries be connected to all of this? How can librarians get the proper training to support the goals of this project? How can the outcomes of these projects be measured?

The director suggested providing maker spaces, art workshops, science workshops, homework support (using teachers from schools to support students in the libraries), science/art videos (online or in the library), innovation promotion and competitions, science competitions, and design workshops. She also expressed that embedding interactive electronic and non-electronic exercises and adding digital audio and video books, science kits, maker spaces, learning labs, and information centers would be beneficial. Libraries can offer many things to make learning better.

Finally, the managing director suggested the following steps to achieve the best leadership approach to reinforce collaboration between schools and libraries:

1. Assign personnel who will be considered as focal points in both schools and libraries and who have the motivation and enthusiasm for such collaboration and are able to deliver the messages and goals in both institutions.
2. Provide career development opportunities engaging teachers and librarians in all the different operations.
3. Since the teacher does not always have the luxury of explaining new projects, launching a campaign that targets students and their parents could be helpful to give a thorough idea. The media material could be both in paper and digital.

4. Build a continuous relationship with teachers and invite them to the different workshops and activities to get their feedback and provide the best services.
5. Reward teachers and librarians who constantly interact and cooperate to reach the educational goals in both institutions.

DISCUSSION OF RESULTS

The Perception of Librarians and Teachers Towards Collaborations to Improve Their Educational Services

The teachers and librarians who were interviewed in this study were in favor of following a collaborative approach that could help schools and libraries meet mutual educational goals. All seven teachers indicated that the virtual environment would help improve the communication between librarians and teachers, especially after the COVID-19 pandemic. The results also highlighted the managing director's support for schools. Such a collaborative approach encourages students to be independent learners. Moreover, the results showed that all the seven librarians agreed that the virtual learning environment helped them during the COVID-19 pandemic in reaching out to more patrons than before, especially those outside the UAE, or those who have no time to attend physical classes due to logistics challenges.

The importance of the disruptive virtual learning environment had increased significantly after the beginning of COVID-19 pandemic when all the schools closed, and the students in the UAE and some other parts of the world continued their formal education classes using virtual platforms. Digital libraries can also be used as part of the disruptive virtual spaces to improve students' research skills, reading skills, and cognitive skills. Therefore, there is potential for the collaborative approach to meet both libraries and schools' needs and act as a communication channel that organizes the efforts in one platform.

As for the curriculum design and content, four teachers suggested designing a new holistic and engaging curriculum that is problem-based and project-based, integrated with school curriculum objectives. This finding also agrees with Moursund's (1999) approach, which indicates that one of the main categories on which P/T Team depends is the formal and informal educational system, which helps people build and maintain their mental and physical capabilities.

Since the COVID-19 pandemic has kept students out of their physical classrooms for a long time and obliged them to sit for long hours in front of their computers to attend their virtual classes, it may be helpful to design programs that combine physical and virtual activities. In order to maintain the students' physical and psychological health, the teacher can ask them, for instance, to listen to a podcast while performing physical activity. Tracking students' physical health (i.e., how many calories they burned) while listening to the educational podcast can help turn technology into a productive tool that improves physical health and cognitive skills. This merge of physical and cognitive activities may promote the life-long learner's healthy lifestyle.

Technology is therefore an essential tool that can harmonize the workflow and keep all the involved parties mentally and physically engaged. Technology comprises either productive or unproductive tools, depending on the way people use them. Therefore, it is essential to combine a different set of tools in a disruptive learning environment to meet each student's learning style and needs and give each student the freedom to choose how they would like to learn (Kicken et al., 2009) to ascertain if assessments of cognitive skills can measure the progress and help to design the proper instructions for each student.

The authors anticipated that merging different types of learning of different educational institutions (formal learning in schools and informal learning in libraries, museums, and learning centers) could provide alternatives of learning styles that are not constrained by the rigid curriculum, examinations, or tight deadlines. The new approach should utilize virtual learning spaces, artificial intelligence,

immersive learning, virtual learning, and any other type of learning to be invented. Moreover, this kind of approach should be flexible enough to be modified or changed in the informal learning spaces without risking a major shift in formal education.

The Expected Educational Services from Public Libraries to Meet Customers' Future Expectations After the COVID-19 Pandemic

Educational services will have to change and integrate more technologies that meet the educators and students' expectations. Since the managing director of the public libraries highlighted that this kind of collaboration would encourage students to become independent learners, librarians in this case can facilitate this through creating and developing programs that empower students' research skills and information literacy skills. Independent learners should also be able to produce knowledge; therefore, media literacy skills are essential.

Services that include programing and artificial intelligence can be creatively designed and offered through physical or virtual settings. Librarians, therefore, should be trained and prepare themselves to act as guides or assistants in programming and artificial intelligence subjects. This can be achieved through intensive courses or hiring more professionals who can provide the best service to their customers. In these terms, public libraries should also appreciate the individual differences in customers and provide student-centered programs that are customized to each level and need. This approach will enable public libraries to constantly elevate the quality of their services which can be evaluated by the stakeholders (i.e., MOE, students, employers). This kind of competition between informal institutions to gain more schools as partners will help libraries expand their roles, attract more job seekers as educational facilitators, and therefore create more funding opportunities for them to operate as business partners to the formal educational institutions. In this case, the possibility of generating revenue for public libraries can create opportunities to serve the boarder community and act as a dominant player in the knowledge economy by investing in the customers' skills and talents.

As for teachers, the support technology can provide is enormous, and therefore will leave more space and time for them to focus on deep human interaction. Artificial intelligence can be used to track students' performance and evaluation, and a common virtual system or LMS can create more communication opportunities not just with national teachers, librarians, and students, but also with their international peers too.

Teachers and librarians can segregate tasks between them. For example, librarians can focus on empowering students' skill levels, leaving more space for teachers to focus on the knowledge level derived by the school curriculum content. This kind of organized systematic approach with clear objectives and tasks can help make this segregation more efficient to all parties involved. The aim of this approach is to involve the whole community in the learning cycle, and encourage teachers, librarians, and students to be life-long learners.

CONCLUSION AND RECOMMENDATIONS

Building a holistic approach that is inclusive yet respects the differences and limitations in formal and informal domains can be very demanding. This will require involvement on all levels: leaders, educators, parents, students, community, and service providers in both public and private sectors. The partnership between formal and informal education entities will ease the pressure on formal education and provide more learning opportunities to students. It will also prepare students to be knowledge contributors in their communities and lifelong learners that utilize all possible learning and technological tools to their advantage. This kind of partnership will create a new set of opportunities and challenges that can be shared and scientifically discussed in future research, which will help develop more theoretical approaches in this domain.

Public libraries and other informal educational entities can step in and help with support. Libraries may operate differently yet share the same larger vision and goals of schools. Combining formal and

informal learning can add more power if pedagogies are used that fit smart learning environments, create visionary plans, and select learning tools that connect these components for use anytime, anywhere. This challenge of schools will no longer be that of schools only but will be shared by the whole community, which can contribute and collaborate to elevate the quality of learning and promote lifelong learning.

In conclusion, educators welcome the collaboration between formal and informal educational institutions. They think utilizing both physical and virtual learning spaces using smart technologies will enhance students' 21st century skills. Moreover, both librarians and teachers think that the virtual activities of the collaboration model are interest-driven, and they do not mind participating as group leaders in the future, which indicates that the research findings can enhance empathy and leadership skills. The collaboration model aims to promote sustainable and productive formal and informal learning. Sustainable learning moments can thrive with inclusive virtual and physical environments, advanced smart technologies, and qualified human capital that adopts different pedagogies that serve all learning needs and styles. Sustainable learning objectives can be achieved through a collaborative leadership approach that follows an innovative holistic model, which merges formal and informal learning components under one umbrella. This model is one step towards considering almost any destination in life as a learning destination that empowers students with the right skills and knowledge. These learning destinations will gradually expand the boundaries until they no longer exist, allowing new educational disruptions to create more opportunities for the future.

The use of advanced solutions, like artificial intelligence (AI), virtual reality (VR), and augmented reality (AR), can be further explored and carefully planned with the integration of the new curriculum. These advanced technologies can offer more interactive and instant assessments of students' performances and aid them with recommendations for further improvements, which may leave more space for educators to focus on their tasks.

The role of educators involved in this new disruptive learning will be worth discovering. It is crucial to provide training programs that prepare them with the right skills and knowledge to cope with the changes. This may also indicate the need for a change in the academic programs provided to higher education students entering the field as teachers or librarians. It will be worth investing in research that identifies the requirements and competencies needed by education providers and facilitators in this new model.

CONFLICT OF INTEREST

This is to confirm and declare that none of the authors of "Public Libraries in the Post-COVID-19 Era" manuscript have a conflict of interest.

FUNDING AGENCY

There is no funding agency for this paper.

ACKNOWLEDGMENT

The researchers acknowledge the participants' (teachers and librarians) contribution during the data collection stage.

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APPENDIX

Interview Questions

The questions sent to the teachers were the following:

1. What are the aspects that should be considered to make a partnership with public libraries successful and sustainable?
2. Do you think that a virtual environment will improve communication between librarians and teachers to improve students' skills, especially after the COVID-19 pandemic?
3. What could public libraries provide to support the improvement of blended learning?
4. Enabling students to visit public libraries on a regular basis to work on their school projects outside schooling hours could improve 21st-century skills. How do you think we could achieve this goal?
5. Different activities are given in the virtual environment (i.e., quizzes, lessons, and discussion platforms). How can the learning process be enriched to provide enough support for life-long learning?
6. Different activities are given in the physical environment (i.e., storytelling, prototypes of projects, and smart projects such as smart homes and drone-cars). What else could be provided to these activities? And what is the best framework to fit in (whether virtual or physical)?

The questions sent to the librarians were the following:

1. How do you compare the virtual services with the physical one you offered, in terms of quality, customer satisfaction, and customer visits?
2. What were the most services used in your department during the COVID-19 pandemic?
3. Do you think that virtual services can help librarians reach out more customers? What are the advantages and disadvantages of the virtual services?
4. What can public libraries provide to support the formal educational system within afterschool programs?
5. How can we enrich the learning process through the virtual platforms? What types of activities and resources?
6. In the physical real spaces (i.e., public libraries), activities such as storytelling, virtual reality activities, smart projects (e.g., smart houses and drone cars) can be conducted. What other activities can be added and what is the best form to introduce them?

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