

The role of libraries in distance learning during COVID-19

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Abstract

As a form of education, distance learning currently shows great promise and the role of online libraries in delivering off-campus information services increases. This paper presents a comparative analysis of measures undertaken by traditional academic libraries in China and Italy in response to pandemic restrictions on educational operations during the lockdown period. The study utilized a specially developed questionnaire, carried out through an online survey, as a means of collecting data from library users (students and teachers). The study population includes 102 random library patrons, including 64 students and 38 teachers who were using services of academic libraries in China at the time. Through comparison with other studies, the quarantine responses of Chinese libraries were identified. The results of the study show that COVID-19 responses of libraries in China went in a direction similar to those in Italy, but the final decisions varied because of different levels of technological development. This knowledge may be used by libraries to identify areas for improvement. The results show that Chinese libraries were more effective in overcoming quarantine restrictions than those in Italy. The overwhelming majority of respondents reported that they had positive experience learning remotely and would not mind if distance learning programs continue to function after the pandemic is over.

Keywords

distance learning, information services, online libraries, China, pandemic.

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Introduction

Traditionally, libraries hold print and handwritten materials (Bachynska and Salata 2016; Rozkolupa et al. 2019), but in the course of time, new ways of storing information emerged and libraries transformed accordingly. Today, libraries are witnessing and participating in the transition to distance learning, a form of education that has been around for some time now. The first generation of distance education refers to correspondence training. It emerged in the 18th century thanks to the creation of a regular and affordable postal service and remains in demand today. Distance learning is a form of education where students and teachers are physically separated and communicate with each other by using various technologies (Ministry of Education of the Russian Federation 2020). Digital libraries in this context take a central role (Lande and Barkova 2013).

Meanwhile, the emergence and development of both distance education and online libraries have been uneven across countries. The mid-1990s saw the rise of digital libraries and distance learning in the US and UK, but it will take years before the same happens in post-Soviet countries. Even today, distance learning is mistreated either as a secondary method of studying, or as an extramural form of education. The sudden outbreak of COVID-19 forced many countries to shift to distance learning, despite many fears and prejudices. It becomes obvious that the future of education lies in distance learning and this creates a need to transform the role of traditional libraries.

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The first victim of COVID-19 was China. Therefore, it is relevant to study how China managed to redefine its education system within the shortest timeframe possible and how libraries were used to their potential in this process.

This study seeks to explore how academic libraries satisfy the needs of their users in unexpected situations, such as the COVID-19-induced transition to online education. The aim of the study is to examine how academic libraries are coping with new demands for educational materials during the pandemic and identify new opportunities for libraries offered by digital technology. The objectives of the study are (1) to review literature on the role of academic libraries in education, library services in distance learning, and responses of libraries to pandemic restrictions; (2) to compare COVID-19 responses of libraries in China and Italy, the first country to suffer from the COVID-19 outbreak after China; and (3) to outline the prospects for further research in the field of online library services. This paper deals with traditional libraries in the era of digitalization. Before the pandemic, libraries were utilizing less digital technologies and for fewer reasons. With the unexpected lockdown due to COVID-19, they were forced to adapt to keep afloat, satisfy the needs of patrons, and ensure continued learning during the pandemic.

Literature review

First and foremost, it should be noted that modernization of academic libraries took place before the COVID-19 pandemic. The leading role in this process belongs to digital technology (Tait et al. 2016), which is often viewed as a disruptive force in the library sector. Nevertheless, modern libraries move from the traditional way of collecting and storing information towards becoming spaces of social learning where knowledge is created and shared (Lande and Barkova 2013; Smirnova 2020; Tait et al. 2016).

According to the Research Councils UK (RCUK), the efforts to de-institutionalize information failed to take enough account of the fact that libraries have evolved continually (Tait et al. 2016). Digital advances have opened up new opportunities for librarians to create new roles and new ways of delivering library services (Huwiler 2016). One of those opportunities is the possibility of creating a single information architecture and knowledge organization structure that facilitate easy access and retrieval from online tools (Library of Beihang University 2020).

This technical infrastructure can help patrons understand the integrity of scholarly publications and find information in an unregulated and unmediated digital environment (Tait et al. 2016).

The reading habits of students evolve: many prefer to access information using digital technology and priorities for libraries transform in line with the process of change (Tait et al. 2016). The challenges faced by modern libraries revolve around the need to reach out to a wider audience and deliver participatory services that allow communicating and engaging with a reading community in dialogue (Tait et al. 2016). At this point, libraries become creative spaces where students can develop products and services. One way to enhance user engagement is gamification, a tool that uses different elements of game design such as competitions, activities, and creativity in non-game contexts (Tait et al. 2016). It is argued that games can stimulate higher-order thinking, be motivational, enhance learning, and aid the illustration of interrelationships between decision-making and outcomes, but the negative consequences of the ill-thought out gamification initiatives should not be excluded (Tait et al. 2016).

At present, some public and academic libraries may not have the equipment to accomplish digitalization, whereas organizational and cultural barriers aggravate this problem (Tammara 2020). Another concern is that these libraries offer resources that are often outdated and have no academic value (Nabushawo et al. 2016). The coronavirus pandemic has uncovered these problems and accelerated the digital transition of educational institutions and libraries. Libraries' response to the pandemic in China was rapid (China Agricultural University Library 2020). More than 94% of quarantined libraries released COVID-19-related information through their websites to reduce the risk of infection and educate visitors about the preventive measures (Guo et al. 2020). The other 6% were unprepared for the challenge (Guo et al., 2020). Most libraries have switched to working online, providing remote access to free electronic resources and support services (China Agricultural University Library 2020). Print materials have been converted into digital formats (Guo et al. 2020). As a result, libraries continued to support universities even in the midst of the pandemic (Sichuan University Library 2020; Tongji University Library 2020; Yunnan University Library 2020).

COVID-19 is not the first pandemic case in China. In 2003, a respiratory virus called severe acute

respiratory syndrome (SARS) hit, and many Chinese researchers examined library services in response to the health crisis (Guo et al. 2020). At that time, public libraries were closed but continued to provide necessary services, facilitate communication, and inform the public about the situation (Guo et al. 2020; Tonini 2020). Based on this experience, libraries were recommended to raise emergency information services to a strategic level (Tonini 2020) to provide accurate and timely information, prevent fear and panic, and fulfill additional roles, such as institutional and community supporters, internal planners, government partners, educators, organizers of information communities, and more (Guo et al. 2020). At present, libraries seek to meet user needs for user-friendly learning resources. For this, libraries are actively engaging with resource providers to carefully collect and organize high-quality electronic resources (University Library 2020), although the proportion of libraries that use remote-access channels does not exceed 34% (Guo et al. 2020).

At the same time, 80% of academic libraries provide multimedia academic resources, such as education courses, lectures by famous teachers, academic reports, examination resources, and vocational training, helping teachers and students perform self-improvement through online learning (Guo et al. 2020). Interestingly, some libraries continued to provide print materials services during the pandemic. To avoid infection, these libraries implemented a non-contact delivery method and organized librarians to send books to the door of the person who has ordered some (Guo et al. 2020). Hence, libraries played the role of social media platforms in disseminating information and maintaining morale during the pandemic (Guo et al. 2020). The emergency response of Chinese libraries has become a benchmark for academic libraries around the world (Guo et al. 2020). The academic libraries worldwide are recommended to adopt emergency plans to be able to carry out in-library safety management, out-of-library disaster relief work (Zhengzhou University Library 2020a, 2020b), and digital optimization of library services in unexpected situations (Guo et al. 2020; Owusu-Ansah et al. 2019; South China University of Technology Library 2020; Wuhan University of Technology Library 2020a, 2020b).

Italy was the first country to suffer from the COVID-19 outbreak after China. However, unlike libraries in China, Italian libraries were not ready to respond (Ponzani and Maiello 2020). The insufficient

quality of library staff and limited funding led to the situation where Italian libraries had not enough equipment to move onto the web (Caselli 2020a, 2020b). Thus, they have had to learn how to handle the emergency (Caselli 2020a, 2020b; Cognigni 2020) and rethink their relationship with communities in a short space of time (Tammaro 2020). The first reaction of libraries was to deliver traditional services, such as rental of print materials, interlibrary loan, cataloging, and reference services. The loan period has been extended and in some cases, the loan has been delivered to the home. Online registration to the library was facilitated and document delivery improved (Solimine 2020; Tammaro 2020). Thus, the pandemic in Italy has accelerated the digital transformation of libraries (Arnetoli 2020; Asta 2020). The libraries began to offer e-books, events, exhibitions, and training programs (Tammaro 2020), introducing a wider audience to an extraordinary amount of resources characterizing the Italian cultural heritage: from art history to archeology, from virtual exhibitions to musical concerts and theatrical performances (Guiducci et al. 2020).

Also, Italian libraries have demonstrated their importance as institutional supporters during the pandemic. For example, the libraries have promoted online courses, such as gymnastics initiatives and courses on cooking (Cognigni 2020; Monti 2020; Morriello et al. 2020; Tammaro 2020). The emergency has made more evident problems such as job insecurity, chronic scarcity of funds, the lack of professionally trained staff, lack of legislation and policies, and lack of vision (Valenza 2020). But the biggest challenge was the lack of digital infrastructure, the lack of devices for accessing resources, and the lack of digital competencies (Baldi 2020). The lack of opportunities to communicate and interact with communities became apparent. Another obstacle to digital transformation was copyright (Tammaro 2020). In general, the COVID-19 emergency showed the need for a digital library transformation strategy, for a new digital paradigm, and for the study of changes in the public perception of libraries (Tammaro 2020). This study seeks to examine the role of libraries in distance learning in response to COVID-19. The objectives of the study are to determine how libraries have transformed to support educators and students learning at distance during COVID-19 isolation and to illuminate the new opportunities related to COVID-19 that libraries may have.

Table 1. Comparative representation of changes in the work mode of libraries in China and Italy during COVID-19

Library changes	Challenges and responses	China	Italy
Negative	Library buildings closed	+	+
	Lack of qualified library staff	-	+
	Lack of access to print materials	-	+
	Use of the Internet is limited	-	+
	Insufficient amount of print materials digitalized	+	+
	Organization of the work tied to the workflow of the printed book	-	+
	Copyright hinders the digitalization of textbooks	+	+
Positive	Delivery of normal library services is guaranteed	+	+
	Use of creativity in the organization of work	+	+
	Implementation of interlibrary loan	+	+
	Non-contact delivery and quarantine of paper-based materials	+	+
	Increased access to digital resources	+	+
	Promotion of online content (ebooks, exhibitions, tutorials, events, concerts)	+	+
	Release of Covid-related information	+	+
	Launching of online educational courses	+	+
	Enhanced communication with patrons	+	+
	Development of new digital paradigms for libraries	+	+

Materials and Methods

Materials

This paper presents a comparative study of responses of academic libraries in China and Italy to the COVID-19 pandemic. The correspondence between library changes was established through the review of two surveys that illustrate the impact of COVID-19 on libraries in China (Guo et al. 2020) and Italy (Tammaro 2020). The results are displayed in Table 1. In addition to that, this study discusses results from a survey of 102 library patrons, including 64 students aged 18-36 years old and 38 teachers aged 32-75 years old. There was no regard to gender differences. The results of the survey were compared with those from the survey of 137 Chinese and 70 Italian librarians (Guo et al. 2020; Tammaro 2020) using the Pearson's correlation coefficient.

Methods

The study uses two research methods: comparative and survey. The survey method involves a specially developed semi-structured questionnaire with question regarding the quality of online services provided by academic libraries and the attitude of patrons toward them. During the comparison of responses of academic libraries in China and Italy, the positive and negative tendencies were identified.

The sample of 64 students and 38 teachers were selected by using simple random sampling. Since this

sample embraces all categories of academic library users, it may be considered as representative. At the same time, it should be emphasized that the sample size does not guarantee that it is representative. Therefore, the results of survey analysis obtained during this study provide a complete picture of changes have swept across academic libraries in China during the pandemic.

The analysis of statistical data was done by using the Student's t-test and Pearson's correlation coefficient. For this, an online calculator was used.

Study design

The study was carried out through several stages. First, the prerequisites, context, directions, and challenges of library transformation were determined. The comparative analysis revealed similarities and differences between transformation initiatives undertaken by libraries in China and Italy. Second, a questionnaire was developed to obtain the perception of library services among academic library patrons in China. For this study, a random sample of 102 academic library patrons (64 students and 38 teachers) who switched to remote learning in response to quarantine was recruited. Third, the information obtained was exposed to statistical processing and comparative analysis. The results were converted to tabular and graphic formats.

Results and Discussion

In order to determine the role academic libraries in China and Italy play in distance learning and how they struggle through pandemic, the comparative analysis of their work modes was conducted. The results suggest that Chinese and Italian libraries have taken a similar path to overcome the pandemic crisis, but the extent of changes varied due to different technological background (Arnetoli 2020; Asta 2020; Guo et al. 2020; Sichuan University Library 2020; South China University of Technology Library 2020; Tait et al. 2020). Nevertheless, the general trends can be useful for identifying the promising areas of library work in modern conditions. Table 1 presents the most important library changes in response to quarantine. As can be seen in Table 1, libraries in China, which COVID-19 caught by surprise, turned out to be more prepared for digital transformation both technologically and organizationally than those in Italy that saw the crisis coming.

The first reaction to COVID-19 in both countries was to close down library buildings, especially since the virus was detected in the overwhelming majority of them (Guo et al. 2020). Because this safety measure was compulsory, it became necessary to ensure that information needs of library service seekers would be met. In China, the shutdown of library buildings did not entail the shutdown of library services (China Agricultural University Library 2020). The libraries found a safe way to deliver what they had to offer and the library staff was qualified enough to harness digital technologies (South China University of Technology Library 2020; Tongji University Library 2020; University Library 2020). This facilitated the rapid transition to new modes of work. In particular, many libraries launched an interlibrary loan service and made their resources available online (South China University of Technology Library 2020; Tongji University Library 2020). Some libraries even offered online training courses for students in a broad range of fields (Guo et al. 2020; Library of Beihang University 2020). Although libraries play a vital role in education in both China and Italy, the reasons behind this vary: in China, the education system deals with disconnected information and libraries received the status of strategic resource, whereas in Italy, the traditional education system heavily relies on print books (Bachynska and Salata 2016; Solimine 2020; Tait et al. 2016; Tammaro 2020). Although China possesses some excellent imperial libraries that store

paper-based ancient books (Bachynska and Salata 2016), the Chinese government also looks towards online library services.

The Internet access was a barrier to public engagement. Note that Internet services in China are more available than in Italy thanks to differences in national mentality and government policy. Hence, the second response of Italian libraries after closure was to guarantee traditional services (Arnetoli 2020; Asta 2020; Caselli 2020a, 2020b; Cognigni 2020). As a result, patrons got their print materials delivered to their doors and interlibrary loans allowed students to find non-available literature in other libraries. In China, the priority has been to increase free access to online resources through networking (Guo et al. 2020; Library of Beihang University 2020). Many Italian libraries failed to support students in remote learning due to the lack of qualified personnel (Morriello et al. 2020; Tammaro 2020). In Italy, older employees clinging to their jobs lack the technology competence of younger generation, while in China, the job competition is fierce, forcing everyone to constantly improve their skills and meet modern requirements. Perhaps, this may be the reason why China was more effective than Italy in coping with the pandemic.

A common and global problem that both countries faced on their way towards distance education was the insufficient number of digitized educational materials (Guo et al. 2020; Huwiler 2016; Lande and Barkova 2013; Library of Beihang University 2020; Nabushawo et al. 2016). An unexpected obstacle to digitalization of textbooks was copyright. This requires a change in law, since issues around digitalized sources and copyright remain unresolved. Noteworthy, the public in both countries was enthusiastic about the provision of new digital content, such as online courses, virtual exhibitions, concerts and other events. However, while Chinese libraries paid more attention to online training courses (China Agricultural University Library 2020; Guo et al. 2020), Italian libraries focused on practical experiences and educational entertainment (Cognigni 2020; Tonini 2020).

The pandemic has changed libraries for better in both countries examined: the overall technology infrastructure has improved and libraries offer expanded services, including wireless Internet. However, Italy still has many issues to deal with. First and foremost, many Italian libraries historically offer only paper-based materials, which led to the complete closure of some libraries and termination of technology illiterate staff members. Other libraries made use of

volunteer services to become digital (Bruni 2020). Other obstacles were the insufficient online access in remote areas and insufficient digital literacy of the population (Tammaro 2020). In general, the benefits of online work turned out to be so tangible for libraries in China that a question arose whether the libraries would be able to return to traditional operations after the quarantine is over and whether it was even worth returning. The results of the patron survey (Table 2) revealed more insights into the work of academic libraries in China during COVID-19 isolation.

For better clarity, tabular data is converted into charts. Figure 1 below shows respondents' perception of distance education in general and Figure 2 shows how they felt about learning remotely. As it can be seen, the results are somewhat different.

Although the majority of respondents reported that their experience of distance learning was positive, not everyone is ready to switch to the online form of education; many prefer traditional classroom sessions, as evidenced by data in Figure 3.

Nevertheless, both teachers and students see distance learning as a promising area (Figure 4) and libraries as a crucial component of distance education (Figure 5) and self-learning (Figure 6).

In general, libraries in China were able to adequately meet patron needs at lockdown by providing necessary (Figure 7) and special services (Figure 8).

Although the range of library services expanded, a few of the respondents surveyed were not aware that libraries have launched new services. The reasons behind this may be both subjective (seldom library visits) and objective (the lack or insufficient availability of information). Considering that respondents were teachers and students who normally go to libraries for educational materials, the lack of awareness in this case is most likely associated with the lack of relevant information. Although most libraries in China reacted quickly enough to the emergency, about 6% failed to respond properly (Guo et al. 2020). Thus, a small percentage of patrons found themselves in a situation where the access to necessary materials was limited. Therefore, libraries should pay more attention to how information services are organized.

The survey questionnaire was designed to collect both factual (the presence/absence of certain services) and subjective (perception of distance learning services) data, yet the survey was rather subjective. The overwhelming majority of respondents reported that

they had positive learning experience at distance and no difficulty using online libraries. However, many still had preference for traditional offline learning. While the learning space preferences of teachers can be associated with their age, conservative thinking habits, and technology inertia, those of students are somewhat unexpected. Chinese students visit social networks on a regular basis, prefer reading an e-book over a printed one, and feel positive about online learning. Still, 35.9% of the students reported that education in the classroom setting was more preferable. When questioned about their reasons for this preference, students explained that in class they can engage in lively communication with peers and teachers, discuss various issues, and immediately find answers to certain questions.

At the same time, more than half of the students preferred distance learning because online classes have been short of distractions and have provided the feelings of confidence and relaxedness. In class, students have to speak in front of a live audience, which can be awkward and cause the sense of fear. With online learning, this is not the case. The study thus shows that the most promising forms of library work are those that deal with the psychological attributes of patrons. This relationship is not part of this study, but it would be interesting to have a closer look at the psychological aspect of library work in the future as well as to determine the proportion of extroverts and introverts among those who prefer learning online and offline. In regards to teachers, they were more restrained in giving estimates, but their overall impression of distance learning was rather positive and they stressed the importance of libraries as strategic sources of information. Be that as it may, the transition to distance learning has entailed growth in library usage, especially among students. It can be assumed that the lack of access to other educational resources, such as visual aids and laboratory equipment, and limited social contacts made libraries one of the leading providers of necessary learning materials.

In China, online libraries are anything but a new thing. Students and teachers in China are literate computer users with free access to the Internet. It is noteworthy that quarantine has facilitated the increase in the use of library services, but teachers and students were primarily concerned about the up-to-date information on COVID-19 and preventive measures adopted by the libraries. Both categories of respondents were equally interested in reference services. It

Table 2. The results of post-pandemic library patron survey

Question	Teachers		Students		t-value (tcr=1.973, $\alpha=0.05$)	P	Correlation coefficient
	N	%	N	%			
Do you find online library services convenient?							
yes	32	84.2	59	92.2	56.57	<0.05	1.000
no	7	18.4	5	7.8	74.95	<0.05	
have no online access	–	–	–	–	0.00	=1.00	
have unstable Internet connection	–	–	–	–	0.00	=1.00	
How often did you use library services during quarantine?							
more than usual	24	63.2	48	75.0	83.44	<0.05	1.000
less than usual	3	7.9	2	3.1	33.94	<0.05	
as usual	11	28.9	14	21.9	49.50	<0.05	
Did your library provide necessary services during quarantine?							
yes	32	84.2	59	92.2	56.57	<0.05	0.875
no	3	7.9	1	1.6	44.55	<0.05	
not sure	3	7.9	4	6.2	12.02	<0.05	
Does your library provide special services in response to pandemic?							
yes	32	84.2	59	92.2	56.57	<0.05	0.500
no	2	5.3	2	3.1	15.56	<0.05	
not sure	4	10.5	3	4.7	41.01	<0.05	
Which of the following library services did you use during quarantine?							
information services through WeChat	26	68.4	57	89.1	95.46	<0.05	0.772
COVID-19-related information services	31	81.2	52	81.3	0.71	=0.48	
access to library resources through CARS	24	63.2	22	34.4	203.65	<0.05	
access to databases through other remote access channels	9	23.7	18	28.1	31.11	<0.05	
instructions on network library services	32	84.2	59	92.2	56.57	<0.05	
free educational content	32	84.2	59	92.2	56.57	<0.05	
online course platforms	11	28.9	17	26.6	16.26	<0.05	
multimedia academic resources (lectures, tests, online training courses)	24	63.2	47	73.4	78.49	<0.05	
free ebooks	11	28.9	38	59.4	215.67	<0.05	
reference services	31	81.2	52	81.3	0.71	=0.48	
researcher support services	16	42.1	4	6.3	253.14	<0.05	
non-contact delivery of print materials	17	44.7	15	23.4	150.61	<0.05	
distance learning support services	26	68.4	31	48.4	141.42	<0.05	
off-campus digital resource services	24	63.2	58	90.6	193.75	<0.05	
interlibrary loan	16	42.1	24	37.5	32.53	<0.05	
How do you feel about distance learning as a form of education?							
positive	16	42.1	61	95.3	376.18	<0.05	1.000
negative	–	–	–	–	0.00	=1.00	
not sure	22	57.8	3	4.7	134.35	<0.05	
Where do you prefer to study/work?							
in the classroom setting	16	42.1	23	35.9	43.84	<0.05	-0.500
from home	10	26.3	36	56.3	67.88	<0.05	
no preferences	12	31.6	5	7.8	168.29	<0.05	
How would you describe your remote learning experience?							
positive	32	84.2	52	81.3	20.51	<0.05	1.000
negative	2	5.3	3	4.7	4.24	<0.05	
not sure	4	10.5	9	14.1	25.46	<0.05	

(continued)

Table 2. (continued)

Question	Teachers		Students		t-value (tcr=1.973, $\alpha=0.05$)	P	Correlation coefficient
	N	%	N	%			
Distance learning is a promising area that needs further development							
<i>fully agree</i>	12	31.6	53	82.8	362.04	<0.05	0.400
<i>rather agree</i>	9	23.7	8	12.5	79.20	<0.05	
<i>not sure</i>	17	44.7	3	4.7	282.84	<0.05	
<i>disagree</i>	–	–	–	–	0.00	=1.00	
Libraries play a critical role in distance learning							
<i>fully agree</i>	28	73.7	57	89.1	108.89	<0.05	0.800
<i>rather agree</i>	5	13.2	3	4.7	60.10	<0.05	
<i>not sure</i>	3	7.9	4	6.2	12.02	<0.05	
<i>disagree</i>	2	5.3	–	–	37.38	<0.05	
The pandemic cause libraries to innovate							
<i>agree</i>	27	71.1	54	84.4	94.05	<0.05	1.000
<i>disagree</i>	2	5.3	3	4.7	4.27	<0.05	
<i>not sure</i>	9	23.7	7	10.9	90.51	<0.05	
Transition of libraries to new modes of work suggests their strategic importance as sources of information							
<i>agree</i>	31	81.6	46	71.9	68.59	<0.05	1.000
<i>disagree</i>	–	–	–	–	0.00	=1.0	
<i>not sure</i>	7	18.4	18	28.1	68.59	<0.05	
Total	38	100	64	100			

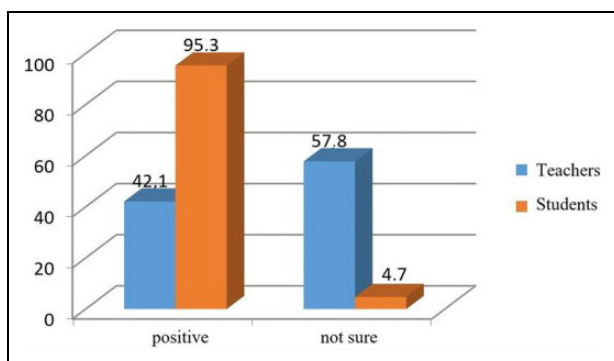


Figure 1. Respondents' perception of distance education

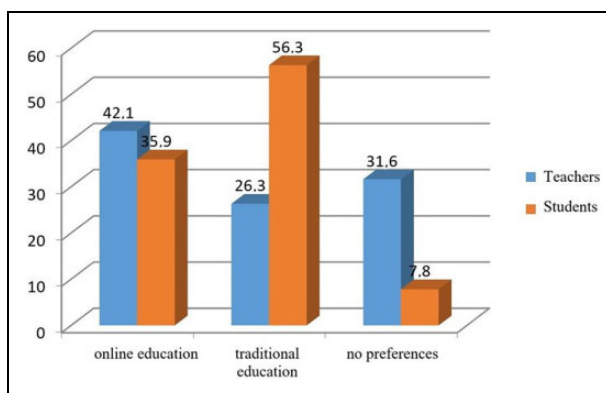


Figure 3. Respondents' preferences for learning

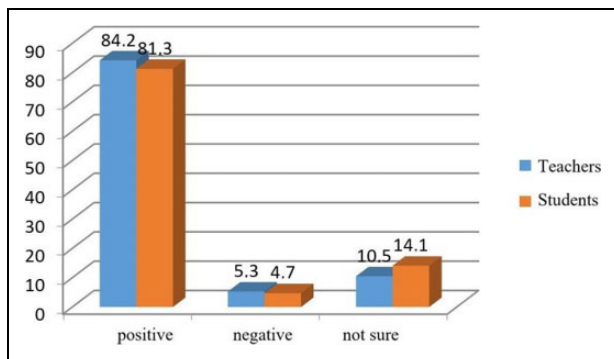


Figure 2. Respondents' perception of the distance learning experience

should come as no surprise that students concentrated on multimedia resources and ebooks, while teachers sought researcher support services and access to citation databases. It is worth noting that students were more actively using WeChat to receive library services and teachers were more likely to have their library materials delivered to them. This can be explained by the fact that older people have traditional reading habits and/or lack digital skills (Mehta and Wang 2020). The results of the study show that teachers searched library resources to find materials that would help them hold virtual classes and students

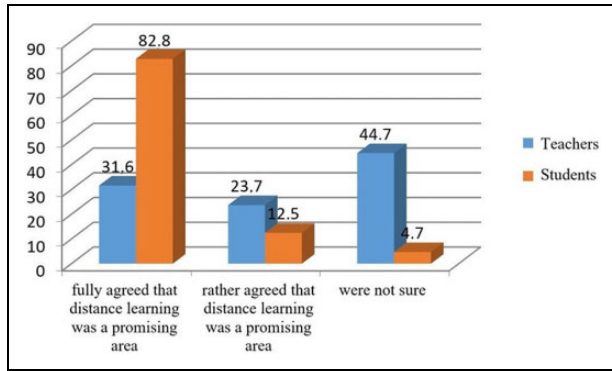


Figure 4. The proportion of respondents who said that distance learning is a promising area

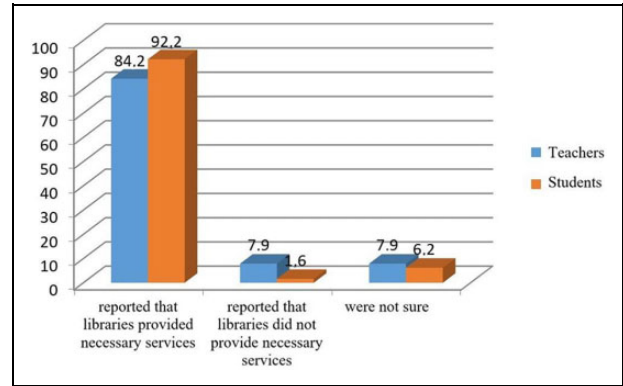


Figure 7. The proportion of respondents who noticed the delivery of necessary services by libraries

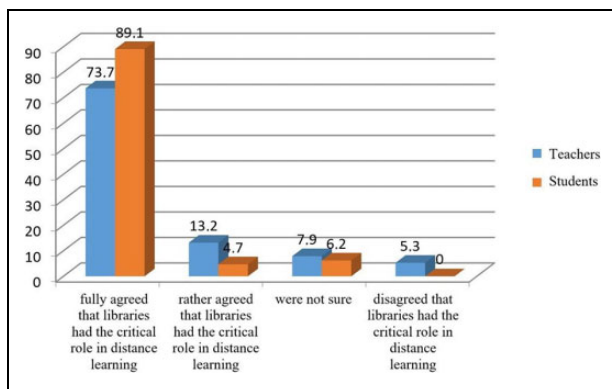


Figure 5. The proportion of respondents who responded that libraries play a crucial role in distance learning

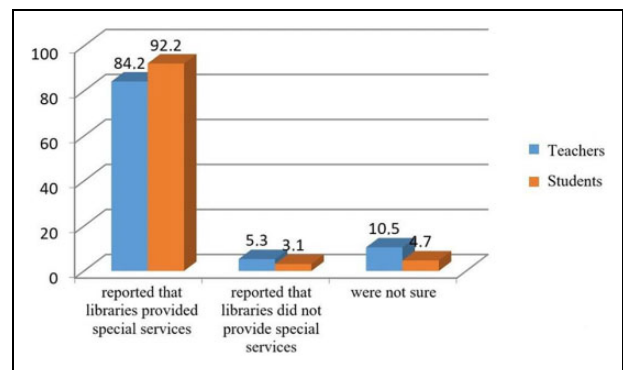


Figure 8. The proportion of respondents who noticed the delivery of special services by libraries

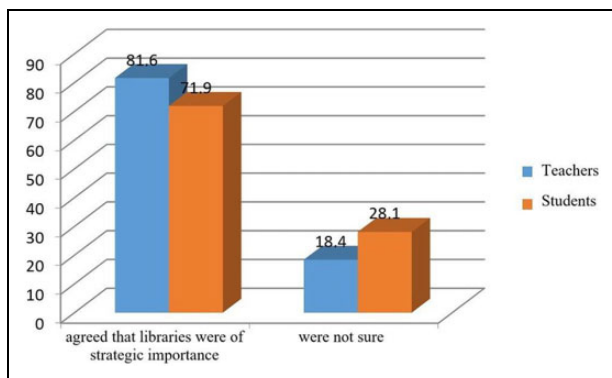


Figure 6. The proportion of respondents who responded that libraries are of strategic importance as sources of information

looked out for libraries with 24/7 access to off-campus digital resources. Despite a demand for free educational content and multimedia academic resources, not all libraries provided access to online learning platforms and online training courses offered by the Ministry of Education (Tammamo 2020). This

issue requires deeper exploration in order to understand how popular and effective those courses are and what challenges they pose. At the same time, libraries used remote access channels opened by some databases and interactive technology solutions to enhance communication with patrons. These changes made library services more accessible and attractive to patrons.

The previous survey (Tammamo 2020) concentrated directly on academic libraries and this study dealt with the perception of patrons. It should be noted that overall, the results of this study are consistent with similar works, that is, library staff members and patrons have a similar impression of COVID-induced changes in libraries skills (Mehta and Wang 2020; Cognigni 2020; Monti 2020; Morriello et al. 2020). This suggests that libraries in China work hard to meet patron needs. The libraries understand the vital role of information resources in education and make sure that technical infrastructure and the quality of staff meet a high standard. An important factor that facilitated a rapid response of Chinese libraries to the

emergency was the far-sighted state policy that assigned special status to libraries after the first incident and created an opportunity for technological development. Yet, Chinese libraries need to rethink their procedures for delivering current service information. This problem aside, libraries may also face challenges associated with technology inertia and unwillingness of library staff to implement innovations, as shown in Italy. These issues require further study, so that it is possible to differentiate prospects for distance education library services and predict potential risks.

The results of the survey among 102 patrons is consistent with the survey of 137 academic libraries conducted in China during the quarantine period (Guo et al. 2020). It was found that Chinese libraries were rather effective in dealing with the quarantine restrictions and supporting distance learning, despite the unexpectancy of the pandemic. This was largely due to a past emergency experience. In Italy, the forced transition to distance education revealed many obstacles and bottlenecks that had been overcome earlier in China (Tammaro 2020), among which include insufficient technology infrastructure, reliance on paper-based materials, digital incompetence of library staff, and insufficient connectivity in remote areas. However, looking at China's experience, Italian libraries quickly and creatively adapted to quarantine measures. They have improved the infrastructure and launched new services (such as non-contact delivery of books and interlibrary loan) to overcome the limitations of paper-based operations. Thus, it can be said that the pandemic had a positive impact on Italian libraries, facilitating the development of new digital paradigms and promoting online content.

Chinese patrons, however, turned out to be no less conservative than Italian patrons. In China, where everything is computerized, the attitude towards distance learning services was not unambiguous, especially among educators. While almost all students described their own distance learning experience as positive (95.3%) and saw distance education as a promising area (82.8%), teachers demonstrated greater conservatism, caution and uncertainty (57.8%) when answering the questions. Many teachers (42.1%) and students (35.9%) preferred traditional education to distance education, but the reasons for such a preference were not the same. The teachers favored traditional education for high demonstrativeness of practical classes and students for lively communication. This does not mean that teachers are against

distance learning. The difference between preferences of teachers and students can be explained by different mindsets. Perhaps, teachers and students both need more time to re-shape their views of education. This conclusion is supported by the fact that more than 80% of students and teachers appreciated the experience they gained when learning and teaching remotely during quarantine.

In regards to distance education library support, students' responses correlate with those of teachers. The overwhelming majority of respondents in both groups emphasized the emergence of special services (Table 2), which have brought the library closer to students and encouraged them to use library services more often than before quarantine. The library usage rate among teachers did not change significantly (Table 2), most likely because teachers had already developed a specific research habit by the time of lockdown, whereas students had less interest in reading educational literature and preferred to spend time elsewhere. Several respondents, both students and teachers, reported that they have sought library services less often than before quarantine and have not been informed about current services. These respondents were most likely non-regular library visitors and therefore had little interest in what libraries had to offer during quarantine. Other teachers and students emphasized that libraries were crucial to distance learning.

Study limitations

The limitations of the study involve differences in education and health care systems between China and Italy, the uneven use of technologies across regions, and stereotypes associated with the role of libraries in education. The study population is limited to patrons at academic libraries in China. Future research should focus on other types of libraries and other countries. Also, the presented data on Italian libraries were gleaned from the existing sources, rather than gathered separately. Articles that were chosen for the purpose of comparison provide information about measures that have been undertaken by academic libraries at the beginning of lockdown, while the survey was launched several months after the first wave of lockdown restrictions when they were no longer stringent.

Ethical statement

All respondents were informed of the aim of the survey, the voluntary nature of their participation, the confidentiality and anonymity of records.

Conclusions

Information technology and online libraries play an increasing role in creating creative spaces for distance learning. The results of this study indicate that online libraries are a priority source of information in the context of non-contact education. The experience of China and Italy examined in this study shows that the COVID-19 pandemic has unveiled the need for digital transformation strategies and programs for libraries that will solve the major library-related problems, namely chronic scarcity of funds, the lack of professionally trained staff, lack of legislation and policies, lack of digital infrastructure, etc.

The comparison of libraries in China and Italy indicates the similarity of directions in which their COVID-19 responses were going, but given the difference in levels of technological development, the final decisions varied. The general trends in library transformation, as shown here, can help identify the promising areas of library work in support of distance education programs. The results of this study show that distance learning faces obstacles, such as a conservative view on education among students and teachers and distrust towards innovations. One of the solutions may be the acquisition of positive experiences of learning at distance and using online libraries. Hence, libraries should pay attention to the quality of digital services and post time-sensitive information critical to learning routine.

The results of this study may be useful in enhancing the role libraries play in distance education. Future research will benefit from creating a model for the supervision and administration of distance learning library services with due regard to the potential emergency risks. The future research may also focus on developing a competency improvement program for distance learning librarians. Another interesting topic is the psychology of library patrons, the understanding of which will enable libraries to improve digital accessibility and attractiveness.

Availability of data and materials

Data will be available on request.

Competing interests

The authors declare that they have no competing interests.

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