Article

https://doi.org/10.22398/2525-2828.82390-106

Design teaching in the pandemic of COVID-19: perspective of teachers and students in the city of Rio de Janeiro

Ensino do design *na pandemia de COVID-19: perspectiva de docentes e discentes da cidade do Rio de Janeiro (RJ)*

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ABSTRACT

Some of the changes in ways of living brought about by the Covid-19 pandemic, despite being announced and emerging since the 20th century, have expanded and consolidated in an unprecedented breadth and pace. This situation increases the demands of facing complex problems, that is, with demands and restrictions in constant change. Since Design is a professional activity that proposes to equate design factors to meet human needs, debates about the challenges for its teaching and practice have intensified. The present work is part of a doctoral research initiated in 2020, which aims to prospect future scenarios for teaching Design, from the perspective of the Covid-19 pandemic. Data collections were carried out, with territorial cuts of the city of Rio de Janeiro (in the period of 2020 and 2021), with controlled follow-ups directed to teachers and students. Positive and negative points and a vision of the future were identified, which lead to a discussion for the continuation of the research.

Keywords: Design. Teaching. Rio de Janeiro. Pandemic. Futurology.

RESUMO

Algumas das mudanças nos modos de viver provocadas pela pandemia de Covid-19, mesmo anunciadas e emergentes desde o século 20, se expandiram e se consolidaram em abrangência e ritmo inéditos. Tal situação amplifica as exigências no enfrentamento de problemas complexos, isto é, com requisitos e restrições em constante mudança. Sendo o design a atividade profissional que se propõe ao equacionamento de fatores projetuais para o atendimento das necessidades humanas, intensificaram-se os debates sobre os desafios para o seu ensino e a sua prática. O presente trabalho faz parte de uma pesquisa de doutorado iniciada em 2020 que tem como objetivo prospectar cenários futuros para o ensino do design, na perspectiva da pandemia de Covid-19. Foram realizadas coletas de dados, mediante questionários estruturados, enviados por meio de formulários online, com um recorte territorial da cidade do Rio de Janeiro (RJ), no período de 2020 e 2021, a docentes e discentes. Foram identificados pontos positivos, negativos e uma visão de futuro que levam a uma discussão para a continuidade da pesquisa.

Palavras-chave: *Design. Ensino. Rio de Janeiro. Pandemia. Futurologia.*

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Received on: 6/3/2023. **Accepted on:** 6/16/2023

INTRODUCTION

On January 30th, 2020, the World Health Organization declared a public health emergency of international concern, and on March 11th, 2020, COVID-19 was characterized as a pandemic (WHO, 2020). A week later, the plenary of the Brazilian Chamber of Deputies approved the request for recognition of a public calamity sent by the federal government in the face of the coronavirus pandemic, thus beginning major changes in all social spheres.

As scientific knowledge about the means of contamination was still limited at the beginning, social distancing was adopted, a term that refers to the physical distance between individuals, as a way to reduce the spread of the virus. This measure included the cancellation of mass events, the temporary closure of schools and workplaces, the blocking of borders and the recommendation for the population to stay at home (WHO, 2020). As a result, the routine and personal ties changed, and, as a result, several social, cultural and economic impacts and resilience strategies in the face of uncertainties came to light (GRISOTTI, 2020). Yuval Harari (2020), in his book *Notes on the pandemic: brief lessons for the post-coronavirus world*, already mentioned the consequences of the pandemic in today's society when he stated that emergencies accelerate historical processes, since decisions that would take years to be deliberated in normal times are approved in a matter of hours, as was the case with the COVID-19 pandemic.

In this scenario, the education segment was also greatly affected; there was an unconditional stoppage of public and private schools, affecting school communities (teachers, employees, parents, and students), at all levels of education. The United Nations Educational, Scientific and Cultural Organization (Unesco), on March 18th, 2020, stated that at least 85 countries have partially or completely closed face-to-face activities in schools to try to contain the spread of the new coronavirus, impacting more than 776.7 million children and young students, which is why the entity chose to support distance and inclusive teaching and learning, which was discussed in a virtual event that took place at the beginning of the pandemic (*apud* AGÊNCIA BRASIL, 2020).

It was possible to observe a true search for solutions so that education could be offered in a different way through new means of teaching, most often by the use of digital communication and information technologies. Such a situation has no precedent with such similar characteristics, especially in Brazil, where large-scale events are rare. Although the country has already gone through the closure of schools with the meningitis epidemic in 1971 and 1974, there was no technological support at the time as there currently is to replace classes (NAKANO; ROZA; OLIVEIRA, 2021).

In view of these events, the functioning of higher education in Brazil came to be temporarily regulated by ordinances and opinions from the Ministry of Education and the National Council of Education, in addition to provisional measures from the federal executive power. Several regulations were established with provisional rules for the functioning of higher education institutions, from replacing face-to-face

classes with classes in digital media, while the pandemic situation lasted, to carrying out research and extension activities online.

The pandemic, in this sense, marks the search for rapid adaptations and new solutions and points to transformations that were already taking place in society. It is based on this disruptive scenario, manifested by the coronavirus, that this work was developed as part of a doctoral research on the construction of scenarios for teaching design, based on the events of the Covid-19 pandemic.

THEORETICAL REFERENCE

According to the definition of the World Design Organization (WDO), which since 2017 has become the name of the International Council of Societies of Industrial Design, one of the main bodies representing international design, design is "a transdisciplinary profession that uses creativity to solve problems and co-create solutions" (WDO, 2018).

According to Cross (2011), the knowledge, skills, and values of designers are found mainly in contributing to the creation and maintenance of the artificial world, through involvement in their activities and their reflection. Thus, knowledge about the nature of design reasoning turns to the skills to design or to shape the human condition, but the difficulties cannot be ignored, since such skills are quite limited. It is necessary to look at factors such as economy, environment, international relations and institutions themselves, in order to help figure out what and how to design.

In the 1960s, the Design Research Society was created by a movement that sought to define design, theorizing the professionalization of the field and the systematic distinction between the practice of design and art and craft. Several discussions were raised and are still present in the field today, such as the rigid framing of design in science in contrast to the dynamic characteristic of the problems that designers have to face (RITTEL, 1987). In this sense, Bonsiepe (2012), in his book *Design as a project practice*, describes what had already been discussed before, when he says that designers have the role of integrating science and technology, highlighting the development of projects for the daily life of a society.

Every discussion about defining the field leads to reflections on design teaching, which has been debated more frequently in recent years. In the 1970s, Victor Papanek announced what would become a criticism that continues today, when he points out, in reference to design schools, that "the skills we teach are often related to processes and methods of an era that ended" (PAPANEK, 1971). The author points out that the methods taught in schools were still focused only on the tangible aspects of the project, without worrying about the real context of its surroundings.

More recently, in 2020, She Ji journal presented a special edition on design teaching, with two editions that addressed different aspects of the subject. In published articles, some reported examples of teaching practices around the world adapted to changes in the current world, and others discussed the necessary changes, in general, in design teaching for the 21st Century, as presented by Meyer and

Norman (2020), who state: "Traditional design education has served us well and should not be discarded, but it does not meet all of today's needs". In this critique, they refer to the different and new specialties in design that require a differentiated education, as they seek to meet the demands of technological, analytical, and cognitive skills not yet covered by the traditional curriculum.

Lawson and Dorst (2009), in the book Design expertise, shed light on specific characteristics of design teaching, starting their reflections with the statement: "A common misconception about design education is that, in fact, it is a form of training for the practice" (LAWSON; DORST, 2009, p. 214). The authors point out the mistake of expecting total preparation for practice during the training period, but they assert that this is impossible because of the size of the field to be attended, which demands from small-scale projects, manufacturing engineering to interfaces of electronic devices, for example. In addition, they address the issue of layers of specialization to form a designer with great expertise, saying that this takes time and cannot be developed only at the university in an undergraduate course, since the time of academia is different from that of the market, and the aim of the university must not be training for practice; individuals must learn this through their own practice.

Another issue is the origin of formal design education. The revolutionary Bauhaus school of art, design and architecture set the stage for many of today's design curricula. Its ideology was to connect art and industry, a context in which design assumes an intellectual role, unlike its origin, based on making things. In the pedagogical sense, Bauhaus brings one of the main characteristics that remain to this day in most design schools, the studio concept. The Ulm School, functionalist in character, also influences contemporary design schools through the nationalization of markets, so characteristic of the end of the 20th Century, with a focus on mass production.

Lawson and Dorst (2009) reflect on current teaching still being based on the Bauhaus and Ulm molds, although current society is totally different, with a new cultural cycle, more plural between human beings and digital interfaces through cyberspace, a space that goes beyond communication, but also involves socialization and learning. This view was also addressed by Bonsiepe (2011), in his book Design, culture and society, in which he mentions the cultural issue as a factor to be considered when it comes to design projects. Santaella (2002, p. 45-46) states: "The advent of each new means of communication brings with it its own cultural cycle".

Therefore, the connection of the designer with contemporary problems is essential. In this sense, as Archer (2005) points out, design teaching should be concerned with "training people who are critical and sensitive" to current problems. By defending the need to approach design from a new perspective, called new learning, Buchanan (2001) reinforces the need to perpetuate a new type of university through a balanced dynamic between theory, practice, and production and draws attention to the permanence of the separation of trades propagated

in universities. While theory was highly valued in these institutions and practice was only tolerated, production and doing remained outside learning matters (BUCHANAN, 2001).

Back to Lawson and Dorst (2009), the authors also characterize the learning style in design teaching by the idea of learning by doing, in which teachers have the role of tutor and pass on to students a series of design projects that must become more and more difficult. However, under these conditions, according to this conception, practical skills necessary for the design project are not taught at the university, in the traditional curriculum, but in extra courses or even in the market, which becomes a paradox. Therefore, the teacher's role is essential in guiding students through the layers of learning, but it is not a determining factor for learning design skills.

Another particular pedagogical characteristic of design teaching considered in this research to analyze the collected data is studio-based learning (LAWSON; DORST, 2009), in which the concepts of contextualized problem-solving practice (SCHON, 1983; BUCHANAN, 1992) and the creation of artifacts (SIMON, 1996) and practical activities, such as workshops and modeling, are particular characteristics of this teaching-learning practice. In addition, the studio concept in design teaching is often understood as a series of steps emphasized by processes and methods, such as information gathering, idea sketching — representations with presentation drawings or physical models —, technical drawings and prototypes leading to the solution of a problem. The social components of the studio are considered worrying factors when it comes to online teaching, especially by teachers who had to migrate to face-to-face classes during the pandemic. This subject will be discussed in more detail next.

As a way of delimiting the present study, only the characteristics of design teaching were highlighted according to the demands of the current moment, especially after the pandemic:

- designing as a skill inherent to the field;
- considering the project's contextual factors, such as social, environmental, and economic issues;
- balance between theory, practice, and production;
- teacher as a tutor rather than a coach;
- teaching-learning process according to the cultural cycle.

METHODOLOGY

Of an exploratory nature, this work is a collection of data from teachers and students of undergraduate courses in Design. Two questionnaires were created for all higher education institutions that have an undergraduate course in Design in the city of Rio de Janeiro (RJ), according to the e-MEC website. The questionnaires were prepared in an online form and directed to known people who had a bond or contact with someone from the institutions, but the survey did not reach all previously selected entities. The questionnaires were sent at two different times: first, in the

period between August and September 2020, and then in March 2021, as the measures taken to maintain activities at the beginning of the pandemic were different in the institutions, some with immediate adoption of the remote model of teaching, as in private ones, and others with the adoption of extracurricular activities before the start of remote classes, as in public ones.

As part of this data collection, higher education institutions that offer undergraduate courses in Design located in the city of Rio de Janeiro were chosen, including Universidade Federal Fluminense (UFF), which is located in a neighboring municipality, in the metropolitan region, because of the ease of access to those surveyed and the diverse nature of the institutions located in the region.

To facilitate the analysis of the collected data, the research was divided into three parts: profile, with a brief presentation of the higher education institution and the professors and students who answered the questionnaires; analysis of responses about remote classes; and, finally, points about the future vision of the respondents.

PROFILE OF HIGHER EDUCATION INSTITUTIONS THAT OFFER DESIGN COURSES

The profile of higher education institutions differs in different categories, such as the type of academic organization, the administrative category, and the degree of training. Such variables are important for a more detailed analysis, since they influence both structural and cultural issues of each type of institution.

According to the Ministry of Education (BRASIL, 2022), based on the e-MEC search platform, which contains higher education institutions and courses registered with the Ministry of Education, 37 design courses are currently offered in 15 educational institutions in the city of Rio de Janeiro, as can be seen in Figure 1. Of the 16 entities, one is federal public, another state public, nine are non-profit private, and four are for-profit private institutions. There are five colleges, four university centers and seven universities, considering the administrative category. Of the 37 courses offered, 12 are bachelor's degrees and 25 are technological ones. Ten different nomenclatures of courses in the area were found: Design, Graphic Design, Interior Design, Animation Design, Fashion Design, Games Design, Visual Communication Design, Industrial Design, Game Design, and Service Design.

The questionnaires were sent to teachers and students of the institutions and reached 13 of them, three of which were public: Universidade do Estado do Rio de Janeiro, Universidade Federal do Rio de Janeiro and UFF; four for-profit: Universidade Estácio de Sá, IBMR, Universidade Veiga de Almeida and Instituto INFNET; and five non-profit ones: Pontifícia Universidade Católica do Rio de Janeiro, Technology Center for the Chemical and Textile Industry, Unigranrio, Centro Universitário Carioca and the National Service for Commercial Learning. As mentioned in the methodology section, the forms were sent to a personal contact network (teachers and students) that had a bond or connection with the institutions, but it was not possible to reach all previously selected institutions.

HEI acronym	HEI name	Management	Academic organization	Course name	Degree	No. of campus
UNISUAM	CENTRO UNIVERSITÁRIO AUGUSTO MOTTA	Private non-profit	university center	Graphic design	Technological	1
				Interior design	Technological	2
	CENTRO UNIVERSITÁRIO IBMR	Private for-profit	university center	Design	Bachelor degree	1
				Graphic design	Technological	1
				Interior design	Technological	1
UNINASSAU	CENTRO UNIVERSITÁRIO MAURÍCIO DE NASSAU DO RIO DE JANEIRO	Private for-profit	university center	Game design	Technological	1
				Service design	Technological	1
UNICARIOCA	CENTRO UNIVERSITÁRIO UNICARIOCA	Private non-profit	university center	Design	Bachelor degree	1
ESPM	ESCOLA SUPERIOR DE PROPAGANDA E MARKETING DO RIO DE JANEIRO	Private non-profit	College	Design	Bachelor degree	1
FATEC	FACULDADE DE TECNOLOGIA SENAC RIO	Private non-profit	College	Graphic design	Technological	1
SENAI-CETIQT	FACULDADE SENAI-CETIQT	Private non-profit	College	Design	Bachelor degree	1
FACHA	FACULDADES INTEGRADAS HÉLIO ALONSO	Private non-profit	College	Graphic design	Technological	1
INFNET	INSTITUTO INFNET RIO DE JANEIRO	Private for-profit	College	Animation design	Bachelor degree	1
				Game design	Bachelor degree	1
				Interior design	Technological	1
				Graphic design	Technological	1
PUC-RIO	PONTIFÍCIA UNIVERSIDADE CATÓLICA DO RIO DE JANEIRO	Private non-profit	University	Design	Bachelor degree	1
UCAM	UNIVERSIDADE CÂNDIDO MENDES	Private non-profit	University	Interior design	Technological	1
UCB	UNIVERSIDADE CASTELO BRANCO	Private non-profit	University	Graphic design	Technological	1
UERJ	UNIVERSIDADE DO ESTADO DO RIO DE JANEIRO	State public	University	Design	Bachelor degree	1
UNESA	UNIVERSIDADE ESTÁCIO DE SÁ	Private for-profit	University	Graphic design	Technological	3
				Fashion design	Bachelor degree	1
				Fashion design	Technological	1
				Interior design	Technological	2
				Design	Bachelor degree	1
UFRJ	UNIVERSIDADE FEDERAL DO RIO DE JANEIRO	Federal public	University	Visual communication design	Bachelor degree	1
				Industrial design	Bachelor degree	1
UVA	UNIVERSIDADE VEIGA DE ALMEIDA	Private for-profit	University	Graphic design	Technological	2
				Animation design	Technological	2
				Interior design	Technological	2
					Total courses	**37**

Figure 1 – Higher education institutions: Design courses, Rio de Janeiro (RJ), 2023.

Regarding remote performance, in the first half of 2020, only private institutions immediately migrated to the online class model. Public institutions, at first, developed some extracurricular activities online, and only in September 2020 did classes for the first half of 2020 return, in remote mode.

The first questionnaire was answered by 189 students and 41 professors, and they were requested to share their contact info for further research. Therefore, the second questionnaire had a smaller reach, as it was sent only to those who left the contact, being answered by 36 students and 15 teachers.

The variables to compose the students' profile were: age group, gender, and course. As it was an initial research, after the analysis, it was noticed that other variables would be important for a more detailed analysis and data triangulation, being included in other collections later on, such as family structure; whether one works or just studies; place of residence; electronic devices available and internet access. Regarding the age range of the participants, 28% were between 17 and 20 years old, 43% between 21 and 24 years old, 18% between 25 and 28 years old, and only 10% over 29 years old. Crossing the information with educational institutions, it was found that the profile above 29 years old belongs to private institutions. Regarding gender, most identified themselves as female (65%), followed by male (33%), and non-binary (2%). Among the mentioned courses, 30% belonged to Fashion Design, 30% Product Design (Industrial), 25% Graphic Design, 10% Design, and 1% Digital Games, with 51% belonging to bachelor courses and 49% to technological ones.

The variables to compose the professors' profile were: age range, gender, graduation, title, teaching institution where they teach, courses they teach, and teaching time. Regarding age range, 27% were between 31 and 39 years old, 20% between 40 and 49 years old, 33% between 50 and 59 years old, and 20% over 60 years old. Of those who responded, 51% identified themselves as female and 49% as male. Academic training was mostly in Design (80%), although other areas of knowledge also appeared, such as Communication, Engineering, History, and Arts. The majority (61%) had a doctor's degree, 33% a master's degree, and 6% a specialist, mostly in the area of design (62%), followed by engineering (23%), arts (10%), and education (5%). Regarding teaching time, the majority (50%) had been teaching for more than 10 years, 37% between 6 and 10 years, and 13% had up to five years of experience. Professors from private institutions taught at more than one institution, and most worked in several courses in the area, Design, Graphic Design, Industrial Design, Fashion Design, Interior Design, Animation Design, as well as Visual Arts, Advertising, and Journalism. This profile shows the interdisciplinarity of the area; even though the teachers' basic training is in Design, it is clear that the degree and performance occur in other areas.

QUESTIONNAIRE ANALYSIS

Research on remote classes addressed similar issues for teachers and students, but in a slightly different way. The main objectives were to find out how the adaptation to remote classes was and to raise the main advantages and challenges.

Of the institutions surveyed, 80% adopted this remote teaching system for the first time, and the platforms most used initially for online classes were Google Meet, Google Classroom, and Microsoft Teams.

In the questionnaire sent to the students, they were asked if the classes were already in the online model, the positive and negative points of these classes, as well as the impressions of the main challenges faced. In the first questionnaire, sent in June 2020, 58% of students had fully remote classes, 10% partially remote, and 32% did not have remote classes. In the second questionnaire, in March 2021, everyone had already started classes remotely. This information is consistent with the administrative profile of the institutions, since the public ones took a little longer than the private ones to migrate to the online model, which already shows that the administrative structure has a direct impact on the analysis of the courses.

For the analysis of the responses, the information was transferred to a spreadsheet, and the affinity diagram was used, which consists of a tool to group related information and identify patterns, trends or areas of common interest, organize and synthesize large amounts of data in a structured and visually intuitive way (PEINADO; GRAEMI, 2007).

First, the keywords of each response were highlighted in the spreadsheet and then transferred to post-its, to facilitate grouping by affinities. In the positive points, 14 main keywords stood out, which were separated into four large groups: daily life, study, teacher, and personal.

Day-to-day aspects were the most cited in the responses, with the terms "time saving", "convenience" and "money saving". With this, two factors can be highlighted, the way of life of the society of the 21st Century, with the development of the fourth industrial revolution, whose main object is data, information and the internet, bringing an overload of information and the need to belonging through the performance of different activities (HARARI, 2018); and urban mobility, since commuting to schools can be a factor of great expenditure of time and even money, due to Rio de Janeiro's poor quality urban mobility, characterized by an excess of vehicles, due to the growing urbanization and the policy of prioritizing individual transport over public transport in the second half of the last century, in addition to the lack of safety and infrastructure on roads and public transport (BORBA; DUTT-ROSS; DANTAS, 2022).

Study aspects refer to class activities. An interesting point mentioned by some students was the issue of continuity of classes, also mentioned a lot in the literature survey, which reinforces that the decision to continue classes remotely was a good alternative for the isolation of the pandemic. Recorded classes also appeared as a positive point, since students could watch them again for a better understanding of the content or even later, in case they missed classes. This relates to the issue of schedule flexibility. Another factor to highlight was the good interactivity during remote classes, both regarding the relation between teachers and students and among students themselves. Finally, it was mentioned that the organization of class materials and access to them improved with the online model.

Questions related to teachers were separated from the study aspects, as they emphasize the importance of the teachers' role at this critical moment, *i.e*. the beginning of the pandemic. The most cited points were the dedication and attention of professors, as well as the creativity in the classes and the improvement in communication through different channels, such as email and WhatsApp.

Finally, the last group refers to personal aspects, with answers about improvement in the discipline to study. Another interesting point mentioned was the shyness of some students, who feel more preserved in online classes, managing to participate more.

On the negative side, 14 keywords were highlighted, separated into five large groups — technology, interpersonal, environment, study and teacher —, which were also organized in Miro to facilitate visualization.

Aspects related to technology were the most cited as negative points. The connection to attend classes, with the dependence on good internet access, was the question that most stood out among all the answers to the questionnaires. Although the National Household Sample Survey: Access to the Internet and Television and Possession of a Cellular Mobile Phone for Personal Use has shown an increase in the number of households with internet access, which is present in 90% of Brazilian households, this issue is still quite complex, since for online classes it is necessary to have quality connection (IBGE, 2022). Therefore, the issue of connectivity was a hindrance in the remote teaching model, hampering the learning process and increasing inequalities among students. In addition, the lack of adequate equipment was frequently cited, which also directly harms the learning process, after all, many students attend classes on their cell phones, which is not the most appropriate channel.

Aspects related to the studies were also very critical, with frequent mentions to impairment in the learning process, as it is related to all the factors presented, the problem with access to the internet and connections, the difficulty of communicating with the teacher, the unfavorable home environment, and the lack of attention and discipline. Another issue mentioned was the application of practical classes, corroborating what was raised in research on particularities of teaching design and systematic survey. Practical design classes require laboratories and equipment suited to the disciplines, as well as the manipulation of materials or even specific software, which is difficult to replace or adapt to the remote model. In addition, in these classes, the teaching-learning process goes beyond watching/listening, such as in online classes, since it involves the cognitive system more broadly, provided only by the face-to-face environment.

Some students commented on the disorganization of classes and the institution, especially those who started classes later. About the classes themselves, some mentioned the superficiality of the content, and others, the matter of the class being boring, lacking dynamism.

With regard to teachers, some mentioned the unpreparedness of teachers, commenting on problems in conducting classes, handling tools, and organizing information. It is important to emphasize that this point has been widely discussed

in the works presented on teaching in the pandemic, attributing to older teachers a greater difficulty in adapting to online classes. However, with the questionnaires sent, it was not possible to reach the same conclusion, due to lack of data that could be crossed. Finally, still regarding teachers, difficulty in communication was also reported, especially students who had a more flexible class model or even asynchronous classes. It is important to note that these aspects were also raised in the positive points, which makes it clear that it is not something deterministic in the research, but still relevant to be highlighted as a point of analysis in further research.

The other group dealt with the interpersonal aspect, using the keyword "interaction", which was often cited as negative. The lack of personal contact with colleagues and professors and socializing is still a significant item for academic life. Even though social contact is made possible through technological tools, face-to-face contact provides more incentives for sharing, exchanging and trusting people.

Finally, issues related to the study environment were highlighted, specially lack of adequate space for both theoretical and practical classes. The lack of privacy, due to sharing spaces and equipment, family dynamics with a lot of noise, and household chores were points raised as factors that also directly influence the learning process.

In the questionnaires sent to teachers, the positive and negative points about remote classes were also asked. It is interesting to observe that the challenges are different from those of the students, with work overload and, consequently, physical and emotional overload, which also impair the development of the classes, in comparison with the students' responses. The information obtained was analyzed in a spreadsheet, as well as in the students' questionnaires, separated into keywords and organized in post-its to facilitate visualization.

For the positive points, 16 main keywords were highlighted, which were separated into four large groups: teaching, student, day-to-day, and interpersonal.

Aspects related to teaching itself were the most cited as positive, with reports on learning new digital tools that helped classes and content organization, such as Google Classroom, mindmap, and the like; and new teaching methodologies, with the organization of online group dynamics, real-time research. It was also mentioned that remote classes were an opportunity to review the content of the classes, including current affairs and using more theory, since the practical activities had to be adapted.

Aspects related to students were less pointed out, but some teachers reported that student engagement in classes and activities was important, even those who were not in regular classes. In addition, the result of the activities was also a positive point in this regard.

The day-to-day aspects were similar to the points mentioned by the students, mainly regarding the optimization of time and the convenience of being at home, considering the issue of commuting to institutions, as said by the students, since Rio de Janeiro has a low-quality urban mobility system. In addition, the issue of more time for lesson planning and focus was also mentioned.

Finally, in the group of interpersonal aspects, according to the students' questionnaires, affectivity was much commented on in the answers and, although this point is something that already existed in the face-to-face mode, it was highlighted as important in the challenging moment of the beginning of the pandemic. The connection is also highlighted, with the horizontal relationships between teacher-student and even between fellow teachers being made explicit. Some mentioned that it was important to maintain remote activities as a way of belonging and connecting with the institution.

As for the negative points, 15 keywords stood out, sorted into five large groups: personal, professional, interpersonal, teaching and student.

Several negative points were mentioned related to the issue of work itself. Therefore, this was separated into a specific group, called professional. Although the aspects are all interconnected, those related to the work itself differ from teaching and everyday issues. Work overload was the most cited of all negative points, with reports of excessive meetings, training, extra assistance to students, video recording and editing, organization and preparation of new content, which connects with institutional demand, a point most commented on by professors from private institutions. An important point was the cost of technology, through the acquisition and repair of equipment and internet connection, which was also mentioned by professors from private institutions. On a smaller scale, but no less important, moral harassment was mentioned, especially by superiors, about excessive demands, which is directly related to work overload and institutional demand.

Right after the questions about professional matters, the group that deserves to be highlighted is the personal questions, with answers that refer to physical exhaustion, due to sitting in front of screens for a long time; emotional exhaustion, due to the context of the pandemic, family issues and even work; and psychological and mental exhaustion, with overwork, demands, attention and concern for students.

Another frequently reported point was the loss of interaction with students during classes. Teachers mentioned that most students did not interact during classes, with cameras turned off and little feedback. This point is directly related to the point most cited as negative in the students' questionnaires, *i.e.* technology, difficulty with a quality internet connection, and lack of adequate equipment.

It appears that interaction and engagement were also cited as positive points by a small number of teachers, which corroborates the issue of difficulty with technology by the majority. Following this bias, questions related to the students themselves were grouped, with points associated with lack of engagement in activities, teachers' concern with students' digital access and lack of feedback from some.

Finally, the questions about teaching connect with the students' responses regarding the practical classes. Teachers cited the difficulty in proposing activities that would replace laboratories, using alternative methods and materials, which

caused damage to some disciplines. Some professors from private institutions mentioned the excess of students per class, since the virtual environment has no space limitation; some institutions took advantage of this to increase the number of students per class, which consequently leads to overwork and emotional and psychological exhaustion.

Less mentioned, but also important, was the issue of subject evaluation, especially those that required the application of traditional tests. In the digital environment, it is more difficult to develop an assessment that measures students' knowledge without them having access to the information. This point is interesting to reflect on the positive aspects of new methodologies and didactics. Once students have access to information, it is important to think about what an evaluation model would be like in which they could learn to consult and externalize what was learned.

The negative points of the professors' questionnaires lead us to reflect on the importance of the professors' role in the teaching-learning process in undergraduate courses and highlighted in the pandemic, with their immeasurable effort to maintain activities, crossing their physical, mental, and emotional limits. This leads us to think about the precariousness of their work, which, although not the focus of this research, has already been discussed even before this scenario and now takes center stage, and should be looked at with greater caution in its entire context.

Finally, questions about vision of the future were elaborated in the questionnaires, asking how they imagined the return of face-to-face classes and the world in a post-pandemic scenario. Such questions were elaborated with the intention of bringing insights to the thesis and forwarding the next stage of the research.

The affinities diagram was also used to analyze the answers, organizing the keywords of the answers in post-its. The number of student responses was much higher than that of teachers, in addition to being broader, unlike the teachers, who focused on answering about the future of teaching itself. Therefore, the criteria for organizing the keywords were also different.

For the students' responses, eight spheres were determined: environmental, social, technological, economic, educational, personal, health, and professional, plus a group of generic responses. Post-its in cold colors are words with more positive characteristics, while those in warm colors are more negative. This criterion for organizing and analyzing responses was based on the concept of polarity, used in future studies, and worked as a thermometer, considering the current context. As for the teachers' responses, the grouping criterion was based on the previous organization on remote classes, with three large groups: technology, teaching/learning, and teacher.

In the students' responses, most of the comments revolved around the technological sphere. Many said that technology will be even more present in our daily lives in the future, that the world will be increasingly technological. Some have cited virtual reality, and a negative answer, but worth reflecting on, is technological alienation.

It should be noted that technology also has its downsides and must be analyzed alongside other issues, which will be done later in the construction of scenarios.

The second group with more answers about the future was the social sphere, with answers that assumed that social interaction will be increasingly virtual, while others, in lesser quantity, point to the appreciation of the face-to-face. There were also many positive responses regarding social awareness, looking at the other, at society, empathy. It is noticed that actions to help others at the beginning of the pandemic made people reflect on the importance of the other to the other and the hope that in the future this will be more consolidated.

In the teachers' questionnaire, questions related to the teaching-learning process were more recurrent. Many mentioned that remote classes, according to the online teaching model, will be a trend in the future, with emphasis on theoretical disciplines and project guidance and course completion work. Distance learning was also cited as promising, especially in private educational institutions, as it is something more viable in economic terms. The hybrid model was another highlight; some professors said they believed it would be interesting to maintain some face-to-face activities and others, remotely, balancing the issue of time and displacement, much cited as positive points of remote classes.

Other answers about teaching-learning regarded rethinking teaching methodologies and practices, adjusting content, time, and class dynamics. With regard to learning, students became self-taught, a consequence of new models mediated by technology, which demand more discipline and time management. Finally, a divergent issue regarding the quality of teaching: on the one hand, the optimistic view of improving quality, due to the facilitation of technological tools, the impulse to re-elaborate practices and methodologies; on the other, the premise that there will be a drop in quality due to the capitalist logic in higher education, which has been growing in recent years.

The group called "technology" was the second largest on future responses and is directly correlated with teaching-learning responses, since most responses revolved around digital tools. Some punctual observations, though no less important, were more detailed, such as the continuation of online meetings, lectures and events, due to the advantage of time and displacement. Finally, the last group refers to teachers themselves, citing the issue of the devaluation of the professional and the precariousness of work, especially in private educational institutions, which is a point that is often raised in works on the impacts of the pandemic.

The issue of technology was evident in the answers about the future, the consolidation of digital tools for communication and information management, virtual interaction, carrying out activities such as work orientation, meetings, lectures, and some events, facilitating traveling and saving time. The new online and hybrid teaching models also appeared as possible trends, as well as remote work. In addition, more human issues were also highlighted, such as physical socialization, emotional aspects, social and environmental awareness, as well as concern for work relationships.

FINAL CONSIDERATIONS

The pandemic resulting from Covid-19 boosted several transformations that were already taking place in contemporary society, such as the use of technology and more attention to social and environmental issues. After three years since the beginning of the health crisis, several impacts can be seen and the direction toward the consolidation of some transformations that were already taking place.

Higher education, although still seen by many as displaced by society, due to its time being different from the demands of the professional sphere, has as its premise to form, in addition to trained professionals for the job market, citizens who are aware of the environment in which they live, contributing somehow to society. After the efforts and various strategies to continue classes at the time of physical isolation imposed by the pandemic, higher education has proven to be very resilient, since the use of different strategies to quickly continue classes was a great demonstration that it adapts and responds to society. Although there are many challenges in this process, it is possible to extract learnings and prospect a better-quality education both for the academic community and for society as a whole, which will somehow be impacted.

Design is a transdisciplinary area that uses creativity to solve problems and co-create solutions, with the objective of contributing to the creation and maintenance of the artificial world, involving the designers' reflection on their activities. It also has the function of integrating science and technology, developing projects for the daily life of a society, being an area of knowledge that involves the creation of solutions for both simple and more complex problems, such as products, services, systems, and environments, considering all aspects of the context, from aesthetics to functionality.

Design teaching is an area of study that has particularities, as it is based on a balanced dynamic between theory, practice, and production. In addition, there are several specialties in design that require technological, analytical, and cognitive skills, which makes it even more complex. Design education should not be considered simply training for practice, but an education that encompasses several layers of expertise, and should aim to form people who are critical and sensitive to current issues. Therefore, future design education must consider the new cultural cycle, more plural among human beings, more sensitive to environmental issues, and considering cyberspace as a means of communication and information sharing.

According to research carried out in design teaching during physical isolation due to the pandemic, it was noticed that some emerging aspects of the 21st Century became protagonists, such as the concept of cyberculture. This concept is linked to that of cyberspace, which presents a new social dimension, resulting from a global movement in which real-time connection predominates. It is a learning space in which the use of media tools is presented as a resource to be used in the teaching and learning process, in addition to the search for greater freedom and individuality of the subjects and attention to environmental issues.

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Conflict of interests: nothing to declare – **Financial support:** none.
Authors' contributions: VICHY, P. L.: Conceptualization, Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Writing – Original Draft. MEDEIROS, L.: Conceptualization. Formal Analysis, Methodology, Project Administration, Supervision, Validation, Visualization, Writing – Review & Editing.