“Matters of Concern” as Design Opportunities

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Abstract. Public design can be understood as a perspective that follows democratic approaches to design, addresses collective conditions, and supports the formation of publics. In this paper, we present our efforts to engage with a public design perspective in a case study addressing the topic of dyslexia. The paper contributes to the understanding of the process of articulation of matters of concern in public design. In addition, the results can be considered as opportunities for design that can serve as inspiration for other projects addressing the topic of dyslexia.

1 Introduction

In the book “The reflective practitioner”, Schön [16] suggested that design happens in “messy and problematic situations” and, therefore, should not be seen as a systematic approach to solving well-formed problems. He argued that design happens in a space that emerges through the interaction between the designer and the design environment. In this perspective, the design process is defined as a dialog between the designer, the object of design and the environment. Through this dialog, the design environment becomes a “lived landscape” that facilitates the expression of “what can be through the exercising of what is.”[18]

This understanding of design as a dialog is consistent with the view of design as contributing to the articulation of matters of fact into matters of concern. In recent years, a small but active part of the design literature has investigated the role of matters of concern in the design process. For example, [1] discussed matters of concern as a way to elaborate on the controversies in participatory design approaches to social innovation and [6] elaborated on design as a way to express matters of concern by showing its factors and consequences. In this paper, we present the articulation of matters of concern as part of a project addressing the topic of dyslexia. The results of this articulation process can be considered opportunities for design that can help as inspiration for further research on the topic.

2 Related work

2.1 Public Design

The concept "public design" has been used mainly in fields such as architecture, urban planning and service design to refer to design for public contexts. The concept has been recently introduced to the HCI community by the work of Di Salvo and colleagues [6]. In "The Public Design Workshop", a research studio at Georgia Institute of Technology lead by Carl DiSalvo, technology is used as a tool to articulate issues, contribute to the construction of publics, provide new ways of empowering communities (e.g. homeless community), and stimulate reflection around issues of public interest (e.g. air pollution). In this context, public design is described as an approach that, through issue articulation and problem framing, contributes to the formation of publics understood in Dewey's terms as "a group of people who, in facing a similar problems, recognize it and organize themselves to address it" [5]. These few papers have investigated how design activities can facilitate the formation of publics [12], however further work is required in this direction.

Public design is a relevant perspective to the CSCW community because it deals with collectives, and investigates how they relate to each other and the potential role of technology. Indeed, public design share important characteristics with other CSCW related design perspectives, such as community-based design [17]. However there are also important differences between the two of them: community-based design deals with established communities, while public design deals with the formation of new assemblies of people who face a similar issue and organize themselves to address it [5]. In addition, the concept of community entitles a shared space, being this physical or virtual (as in the case of online communities), and a shared goal and identity [15]. This shared identity is reflected in shared interests and/or practices [15]. On the other hand, publics are heterogeneous and issue-driven [17]. In order to explain this heterogeneity, some authors argue that there is not a public but a multiciplity of publics [5]. As opposed to communities, publics are issue-driven and therefore tend to emerge around controversial issues. These characteristics suggest that adopting a public design perspective entails embracing methods to facilitate articulation of these issues from different actors. In order to address this objective, the concepts of matters of fact and matters of concern seem like a path worth pursuing.

2.2. "Matters of concern" in design

In 2004, Bruno Latour elaborated on the concepts of matters of fact and matters of concern and argued that the former refers to issues that claim to report objective conditions, whereas the later refers to "highly complex, historically situated, richly diverse" political and social conditions [11]. Following this line of thinking, he proposed that matters of fact could be articulated into matters of concern. Ever since, the concept of matters of concern has been used in a few studies within the design community [e.g. 1, 2], and in particular in public design [6]. In these studies, the concept is instrumental to the articulation issues, understood as complex situations

that involve several actors, or groups of actors, who have different positions with respect to the issue, and to the formation of publics [12]. An important characteristic is that the elaboration of the space of design in terms of matters of concern entails an understanding of design as a process of dealing with issues, rather than solving problems [6]. Some of these studies investigate how technology design can help express matters of concern [6] and some others engage with the concept as a way to analyse, communicate and reflect on relevant actors and controversial issues [2]. Even though the articulation of matters of concern seems to be an important aspect of the design process, these studies do not show how this articulation can be actually attempted.

The contribution of this paper consists in the articulation of matters of concern in the context of a project dealing with the topic of dyslexia. Furthermore, this articulation process can be considered as facilitating the emergence of design opportunities that might facilitate public formation. Finally, the identification of these matters of concern constitutes a contribution of its own since it might be interesting to address them in the context of other projects addressing the topic of dyslexia.

3 Case study

The case study deals with the development of a physical and virtual space around the topic of scholastic inclusion, understood as the acknowledgement and facilitation of different ways of learning in a scholastic context, with a special focus on dyslexia. The process of design was initiated by different research activities that were aimed at understanding existing controversies, with an emphasis on the relevant actors and their relationships.

3.1 SPAZIOd

The activities presented in this paper are being developed in the context of Città Educante (2014 - 2017), a program that aims to contribute to the infrastructuring of a city as a learning place. This vision is an alternative to existing technology-centric approaches of the “Smart City” [8], which tend to focus on system development and data gathering, and often overlook cultural, societal and individual aspects [8]. Città Educante covers three main thematic areas: school/education, society and technology. These thematic areas envision activities that contribute to the development of an active, welcoming and reflective city where technology is seen as a mean and not as a goal. As part of our involvement in the project we have started SPAZIOd. This project wants to address the difficulties that the current educational system faces when dealing with different ways of learning, with a special focus on dyslexia. The choice of starting this project was grounded on the suitability of the topic to the Città Educante program and a personal and professional interest of the researchers involved.

The project is developed in a small region in North Italy, where the local government has an especially powerful position. In addition, the project was timely

situated in a moment in which new educational policies mandated a Content and Language Integrated Learning methodology in German and English. This approach prescribes teaching a language and a subject at the same time (e.g. teaching mathematics in German). The trilingual policy was launched in September 2015 and encountered fierce resistance from teachers and parents. A source of controversy was that the project did not make any reference to learners with different ways of learning. These characteristics render SPAZIOd as a case of public design because it addresses a collective condition that involves many different actors that have diverse, and often conflicting, views on the same matter. Interestingly, the conflicting views are not only related to the particular setting of the project but also to the topic of dyslexia.

3.2 The dyslexia debate

In their recent book "The dyslexia debate" [7], Elliott and Grigorenko describe how dyslexia has been a source of controversy for a long time. Even though experts agree that dyslexia relates to a difficulty in decoding and/or producing written language, there is no generally agreed definition, nor shared understanding, of its nature and causes, and little is known on how to address it in practice [7]. This lack of consensus might have raised some skepticism, reaching the point that in 2009 a British Member of the Parliament claimed that dyslexia was a myth invented to excuse poor teaching in schools [3]. In spite of the lack of an agreed definition, there are shared underlying conditions that are commonly considered when doing a certification of dyslexia. These conditions include IQ equal or superior to the average, no physical disability (e.g. visual impairment), adequate schooling and not being at a socio-economic disadvantage [7]. However, certification is not free of controversy either, as it is subject to interpretation and largely affected by the context. This complexity might partially explain the large variability in dyslexia incidence, which ranges from 5-8% to 20% [7].

In Italy, the context in which the research reported in this paper is situated, the dyslexia debate has been exacerbated in the last few years due to a recent law. Particularly, the Italian Law 170, approved in 2010, recognizes dyslexia as a "learning disability" and provides a set of criteria for diagnosis, requirements for teachers' formation, didactic instruments and support to families.

In the design community, there are only a few studies that deal with the topic of dyslexia. Most of them present specific design artefacts that support dyslexic children in different activities [19, 14, 9]. However, to the best of our understanding, the topic of dyslexia has not yet been addressed as an example of public design, which understands the issue as a collective condition that might trigger the formation of a public.

3.3 Method

Several research interventions were carried out to collect data regarding the context. In this paper, we build on ethnographic activities performed by the authors, who participated in several events around the topic of dyslexia (e.g. seminars at schools

and meetings organized by a parent group), analysed online data collected from websites and social network groups, and performed eight semi-structured interviews. While being involved in these activities, we realised that the topic entailed an important emotional component, especially for children. Most of the activities involved actors and activities related to children up to 14 years old. For this reason, and based on ethical considerations, we decided not to involve children directly in the initial research activities.

Eight interviews were conducted with a group of parents, teachers, educators and local government officers. Parents and educators were approached due to personal knowledge; teachers were selected based on the recommendation of the two interviewed officers. One officer was responsible for Inclusion and Equality and the other for the implementation of the trilingual policy in schools. The interview script was designed building on the data collected through ethnographic activities. In particular, it addressed potentially controversial topics emerged during the analysis of this data, such as the understanding of dyslexia as well as the certification process and public opinion.

At the end of the interviews, participants were invited to engage in an actor mapping activity. This activity was aimed at identifying relevant actors, understand how they perceived themselves and others, and facilitate the emergence of potential controversies. In public design terms, this activity enabled the identification of potential, or existing, publics and how they related to each other. To fulfill this objective, participants were given ten post-its with the names of the relevant actors, and an empty A3 cardboard. The list of actors was created using the actors who were mentioned during the seminars and meetings. This list included teachers, children, parents, associations, schools, local government, researchers, local health department, and private companies. In addition, participants were provided with a set of empty post-its, if they wished to add any other actor. Then, they were invited to create a map of the topic of dyslexia, with the actors and their relationships, while thinking aloud [20]. They were told that it was not necessary to use all given actors and that they could add new ones as they wished.

All participants but one allowed recording the audio, which included the interview and the actor mapping activity, and using the data for further analysis. Interviews were conducted by one of the authors; an external researcher transcribed the audio recordings. The primary data of the analysis presented in this paper is the interview transcript. The data was coded using Atlast.ti and thematically analysed in two steps [3]. First, one of the authors coded the transcription individually using open codes to identify recurrent themes, such as “certifications take a long time” and “parents of DSA children are usually very proactive”. The themes were consolidated through comparisons across the interviews and discussions with the authors. In the second step, the themes were used to further identify central statements in the transcripts. The analysis continued through meaning condensation and interpretation [10], yielding to the identification of different matters of concerns.

We triangulated this data with our notes from the observation of several events. They included a four-hour public meeting organized in Trento by the Italian Dyslexia Association, where two bachelor students shared their University experience with parents, younger students and teachers (in order of frequency of attendance) and a two- hour presentation organized in Madrid by the Madrid Dyslexia Association. We

also attended a two-hour presentation hosted by a local school where a local teacher association presented their homework support services offered, and eight hours of meeting of a peer-support parent association. Furthermore, one of the authors had personal experience with the topic. [13]

4 Understanding the design space

4.1 Actors mapping

During the actor mapping activity, most of the participants created a main cluster formed by teachers, parents and children (Figure 1). In most cases, participants thought that this was the main cluster and placed it at the center of the map. However, for some teachers, the school should be considered the main actor, and therefore placed in the center of the map. In this interpretation, the school was regarded as an institutional and central hub that mediated among different actors and clusters of actors.

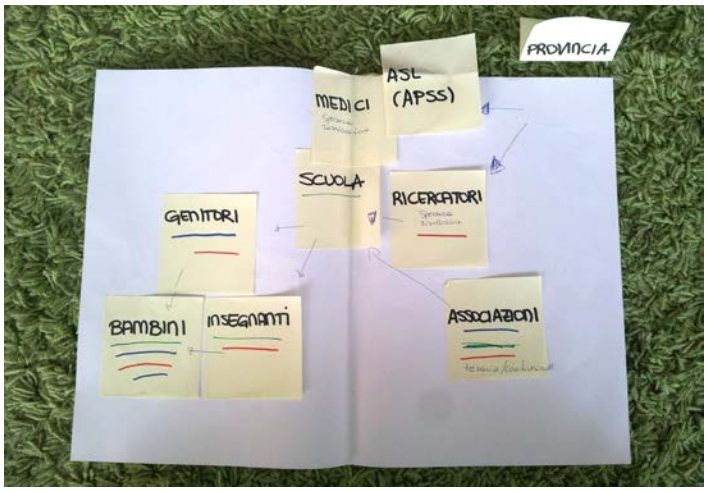

Figure 1. Example of the actor mapping activity

Regardless of where they positioned the school within the map, most of the participants embraced the vision of the school as a central hub. Following this line of thinking, they described that the school should act as mediator, facilitating communication between parents and teachers. However, the extent to which this happened in practice was perceived as limited and influenced by a problematic relationship between parents and teachers. Parents thought that teachers did not understand what dyslexia was, or did not want to understand it, and knew very little about teaching methods and instruments which could support children with dyslexia. On the other hand, many teachers thought that it was difficult to communicate with parents of kids with dyslexia. They complained that there were some parents who did not understand the issue, or overlooked it, and some others who showed an excessive

preoccupation accompanied by a little willingness to collaborate. Teachers proposed that there should be a referent in the school specifically dedicated to the mediation between parents and teachers. In their opinion, the special needs representative already present in most of the schools should play this role in the context of dyslexia.

Many times the local government, local health department, associations and researchers were placed nearby and understood as the actors which could facilitate the advancement of different aspects related to dyslexia. This notwithstanding, teachers and parents claimed that at the moment this contribution was very limited. In addition, most of the participants pointed out that the collaboration among these actors was quite limited and complex, there were different understandings of which were the weak points. In general, teachers were critical about their relationship with the officers of the local government and highlighted that they mainly contacted them to request data and to ask them to perform questionnaires but hardly ever to reply to their comments, provide information or acknowledge their work. On the other hand, local government officers were generally quite critical about teachers and argued that they were resistant to change, particularly with respect to the trilingualism project. However, they did not point out any specific communication issue with schools, which might be due to the fact that they claimed to usually communicate with the school principals. These officers also mentioned that they had on-going collaborations with researchers and companies, mainly through research-funded projects. Indeed, they particularly mentioned an on-going project dealing with the topic of dyslexia. Interestingly, some of the activities performed in the context of these projects were the source of teachers' complaints regarding data gathering and questionnaires distribution.

Most of the participants agreed on the importance of associations as mediators among parents, schools and local government. However, both teachers and officers highlighted that associations formed by parents could sometimes hinder this communication because they tended to be critical but did not propose ways to address the criticisms. In general, the term "associations" was perceived as a too general for denoting the complexity of roles enacted by this actor. Even though a few people added new actors, most of them did it to highlight the difference among kinds of associations. Most of the people distinguished between social cooperatives, which offered support services during and after school hours; and parents associations, which were usually perceived as grassroots communities that were born out of the need to improve the communication among parents, schools and the local government.

Some people highlighted that collaboration among the local health department, researchers and teachers was especially important. Some teachers expressed their interest in attending training activities organized by the local health department and researchers. They explained that this collaboration could help teachers, and especially those who played the role of mediators between the school and parents, have a high quality training based on scientific knowledge. Most of the participants left the actor denoted as "companies" outside of the map, stating that they played a minimal role in the debate. In most cases, companies were considered as possible future employers and potential sponsors for activities.

The actor mapping activity highlighted two main findings. In the first place, there is a need for mediators that can intercede among actors, or group of actors. For example, mediators are needed to intercede between teachers and parents. They are also needed between the local government and the parents. The second finding is that there is currently a public in formation. This public is a grassroots community formed by parents who have a personal interest in the topic of dyslexia.

4.2 Matters of concern

Public awareness. Most of the people agreed that there is a lack of public awareness regarding the topic of dyslexia. However, most of the tensions were not only triggered by the lack of public awareness but also by the understanding of dyslexia as a disease, or a disability. Parents, teachers and officers felt unease with this understanding and denounced that it was something that needed to be changed. Paradoxically, most of the existing initiatives to improve awareness were addressed to people who already had a personal or professional interest. According to teachers, not knowing or misunderstanding dyslexia became especially problematic when they spotted a child who might have difficulties reading or writing. In their opinion, when this happened parents who did not know about dyslexia became scared, or in denial:

"*I have children in the fourth class of the elementary school that do not have the certification because pupil's parents… there is always a familiar context that it is not the same for all children and in which it is not possible to intervene. I think that as parents everyone tries to do their best for their children, but many times one does not arrive to the point*" [Teacher]

Furthermore, teachers also highlighted that that some parents did not want their children to work with dyslexic children because they thought that it might hinder their learning. In addition, parents and teachers mentioned that children with dyslexia were sometimes isolated from their schoolmates. In order to deal with this issue, some teachers claimed to adopt strategies to explain children what dyslexia was (for example, by showing movies which contained references to the topic of dyslexia during scholastic hours) or to privilege activities that minimize the differences between dyslexic and non-dyslexic children, such as learning-by-doing activities:

"When we do natural sciences (…), we seed the vegetable garden, I make children hoe and touch the ground (…). They live the discipline and not only study it. In this way, the problem of dyslexia, or any other kind of problem, becomes minimal." [Teacher]

Practical information. In spite of the fact that the local government published a set of operational indications for "specific learning disabilities", most of the actors claimed that it was difficult to find practical information about the topic of dyslexia. In general, teachers and parents thought that finding information regarding legal aspects and practices that could support children at school and at home was a difficult task and sources were sometimes not consistent. This issue was especially

problematic at the schools, where many teachers complained that there was not a protocol to be followed once it became evident that a child might have reading or writing difficulties:

"*(I get the information) through word-of-mouth because no one explains you anything… I know everything through word-of-mouth and experience… I have worked on my own experience because when I need something I become interested on it and I go to the one who knows about it, who at this moment are the special needs educational assistants, they know everything.*" [Teacher]

Some schools initiated activities aimed at providing more information. For example, one teacher (who was also the special needs' responsible at a school) mentioned that her school had created a document that summarized the most important legal aspects related to dyslexia and how to apply them in the school context. Even though the document was shared within several secondary schools, it was not publicly available.

Most of the parents seemed to collect complementary information on how to do the certification from different actors, which included teachers, the local health department and private experts such as logopedists and psychologists. In addition, parents of children with dyslexia seemed to become avid information searchers on the Internet. Face-to-face meetings were opportunities for exchanging and confirming this kind of information. For example, one of the parents association organised evening sessions with addresses several aspects that range from providing support (e.g. adult dyslexics which tell their experience) to facilitating the services of experts (e.g. inviting educators that help children doing their homework). Furthermore, there were some experts and companies in the territory that offered presentations in which they explained the details of the certification process, and offered their private services, or presented their technological compensatory instruments. However, none of this information was stored in a form of a shared repository where it could be openly accessed.

Technological instruments. Most of the actors agreed on the fact that technology can be beneficial for dyslexic children. Indeed, the Italian Law 170 envisions that children with a dyslexia certification have the right to use supportive technology and foresees financial support to families to ensure so. Interestingly, most of the tensions regarding technological instruments emerged due to a limited access to technology at schools. During the research, references to different kinds of technological instruments emerged. Teachers and officers mainly referred to what can be seen as general technological instruments to support learning, such as a computer room and interactive whiteboards. Parents often referred to assistive technologies, such as the text-to-speech reader and autocorrect spelling, and cognitive training programs specifically designed for dyslexics.

Many teachers complained about the limited technological resources and highlighted that technology did not only help dyslexics but all children. These teachers claimed that the relatively low availability of technological artifacts was due to the limited financial resources, which sometimes generated tensions among parents. On the other hand, officers argued that the technological instruments were

available at schools but teachers did not use them. Indeed, a few teachers acknowledged having little technological skills:

"*I have very basic knowledge, I am not a native user. I have been born in 1970 so I have started using the computer at the university (…). I have reached to the [Office] package, and not even, I know a bit of Excel, Word and several browsers.*" [Teacher]

Access to technology was perceived as paramount by some parents and experts, who argued that computers are for the dyslexic what glasses are for the shortsighted. Indeed, some teachers and parents claimed that children experienced fewer difficulties when they used assistive technologies and cognitive training programs. This notwithstanding, parents complained that when computers were offered to dyslexic children at schools, they tended to be quite old and perceived as something extraordinary. In addition, most of the schools had little technological resources specifically designed for dyslexic and some parents highlighted that people, including themselves, lacked information about the existence and how to use these instruments. Furthermore, the school did not envision specific support for the children to help them learn to use the computer and teachers usually had a limited knowledge of how to use it. Therefore, in most of the cases the family, experts and associations, both in the form of social cooperatives and grassroots groups, were the ones helping children use the computer and identifying available assistive software and cognitive training programs. Unfortunately, this kind of knowledge did reach neither the school nor the teachers:

"When I look around I see parents which have informed themselves, who have children with difficulties and have got information, and they have these kind of [technological] support at home but that at the school usually is not used." [Officer]

Furthermore, excelling in the use of computers seemed to have a positive effect on dyslexic children's self-esteem and, according to teachers, many times they decided to pursue careers in technical topics such as computer science. Several teachers mentioned that once children learned how to use the computer, they became much more skilled with computers than other children:

"*Furthermore, they [dyslexic children] become kind of computer experts because they have this instrument only for them, so many times (…) they become our technicians.*" [Teacher]

In general, most of the actors perceived technology as important in supporting learning. Initially, it seemed that the main issue was the scarcity of technological resources. However, deepening into the issue it emerged that the problem was not only the availability of recourses but also the awareness of available tools and skills on how to use them. This was particularly important in the case of technology designed for dyslexics. The main actors involved were the children, teachers and parents. Interestingly, this issue had already brought some parents together who, through a grassroots community, organized events where experts helped children

using these technologies. Unfortunately, this knowledge remained at a local level and did reach neither the school nor the teachers.

Emotional load. Many of the interviewed people mentioned that dyslexic children were perceived, and perceived themselves, as being different. Some teachers highlighted that being dyslexic was a characteristic "*as having curly hair*" but this did not seem to be a general understanding. Indeed, it is interesting to notice that some of them used the term "*outing*" to refer to the moment when dyslexic children decide to make their characteristic explicit to others. To avoid feeling different from their classmates, dyslexic children often renounced to bring their computer to class, and the family sometimes influenced this decision:

"Often they refuse to use these instruments in class because the are afraid of being judged as different, of being offended. (…) We need to make them [families] understand that using these instruments means providing a sense of fairness. Giving these children something that is missing, the instrument that places them in the same condition as others. Because sometimes they say 'but it's better they don't because maybe after they make fun of them'." [Teacher]

According to some teachers, not using the compensatory instruments might start a vicious circle: without the computer, children might strive to catch up with the rest of the class and, therefore, increase their frustration and lower their self-esteem. Indeed, feelings of frustration, anger, low self-esteem and sadness came out very often. Indeed, these feelings were usually more intense when children realised that they experienced more difficulties than their colleagues, but did not have yet a dyslexia certificate:

"*They are sad children, sad because they feel misunderstood, at the margin of their sociability and often they isolated. They are children that usually stay aside.*" [Teacher]

The emotional distress might be influenced by the fact that in the secondary school (age 11-16) most of the times being different seemed to be perceived as a problem and seldom as a value. Very often during the meetings, parents told stories that referred to negative experiences, frustration and incomprehension. Negative experiences seemed to be especially present during scholastic activities and the certification process. Teachers and, in particular, parents elaborated on several specific practices that could stimulate negative feelings (e.g. highlighting errors with a red pen) or positive ones (e.g. making children more participate in practical activities; highlighting strengths).

Certification process. Obtaining the dyslexia certification was an important milestone in the familiar and scholastic context. Sometimes parents did not understand why their children experienced so many difficulties at school and described the moment in which they obtained the certification as a relief. In the scholastic context, having a certification allowed teachers to start applying dispensatory and compensatory measures:

"*Until the certification does not arrive, in which it says that I am authorized to intervene in a certain way, and even if I have the intuition that the child needs it, until you do not have this damn piece of paper you cannot start doing anything.*" [Teacher]

The certification process seemed to be also a source of controversy. Many teachers and parents complained that the process was too slow; giving place to situations in which children who started the certification process at the beginning of the scholastic year had not got the certification until the end of the scholastic year. Teachers argued that the local health department was the bottleneck in this process. Indeed, the time required by the certification process seemed to be significantly reduced when it was lead by a private expert. However, in other cases, some teachers complained that nowadays everyone who started a certification process "*comes back with something*" and that some children who were certified as dyslexic might only need some additional time:

"*From my point of view, it [dyslexia] is simply a lack of respect for the time that different children need. (…) If they would have done one year more at the kindergarten or one year more of elementary school, they would have probably straighten their path.*" [Teacher]

From the moment the child had a certificate of dyslexia, the family brought it to the school, which could start applying the measures envisioned by the law, such as the creation of the PEP (Personalised Education Plan). The goal of the PEP was to adapt the scholastic activities to each child based on the specific difficulties observed during the certification process. The PEP was usually created by the school and discussed during a meeting with all relevant actors such as parents, teachers, educators and experts.

In theory, the meeting to discuss the PEP should play an instrumental role towards the alignment among different actors. In practice, parents usually complained that the school was little proactive in providing the PEP, which should also be renewed every year, and that some of them did not even do it. Teachers highlighted that the usefulness of this meeting often depended on the kind of experts involved. In their opinion, experts who belonged to the local health department usually did not participate in the PEP meeting and the certification document was too general, difficult to understand (it was usually perceived as "*too technical*") and lacked practical implications for the school.

Collaboration among actors. In many cases, the relationships among different actors seemed to be problematic. The most critical one, especially considering their role in the issue, was the relationship parents-teachers. Interviews and meetings highlighted several conflicts between these two actors. Some parents felt that teachers did not understand the needs of their children and even wondered whether they were qualified to do so. This conflict was highlighted during the meetings, in which it was very common to listen to personal stories of parents complaining about a particular teacher. On the other hand, some teachers felt overwhelmed by the interaction with parents and criticized their unwillingness to collaborate. Surprisingly, officers

thought that parents' opinions, in particular with respect to the trilingualism project, were being manipulated by the teachers, who wanted to the deliberately damage the project in benefit of their personal interest. In addition, officers claimed that the communication with parents did not work and, in their opinion, associations should mediate this relationship:

"Associations should support parents and collaborate with the local government because the associations manage to gather parents' voices, collect their opinions and synthesize them and, therefore, they should be the channel towards the local government. We usually experience a communication parents- local government and parents-public institution…. That it does not have much sense, it is not efficient and the system does not learn. And this is a problem." [Officer]

Indeed, teachers also saw the associations as playing a central role since they could address a broad range of needs. For example, associations were perceived as an actor that can help mediating between different actors (e.g. local government-parents and school-parents), providing information on procedures and available materials (e.g. certification process, legal issues, compensative instruments) and infrastructuring the offer of supporting services (e.g. provide educators, organize home-work groups after school). However, officers and teachers thought that currently some associations were also detrimental since they brought too many complaints and too little proposals.

Digitalization of practices. Most of the teachers used the Internet to look for didactic resources, such as media content to show to the students and examples of practical activities to be implemented in the classroom. Many of them identified specific websites or video channels to find material. These activities were usually performed alone and not shared with other teachers. In spite of this interest, there seemed to be also a part of the teachers who show some resistance to technology and argue that it cannot supplement face-to-face and hands-on activities. An interesting case came out during one of the interviews, in which one teacher described how a group of teachers at her school was trying to collaboratively create a virtual space for sharing relevant didactic content. During the interviews, she mentioned that they had not finished yet because, in spite of the fact that the school's IT services helped them with the technical issues, adding content was too tiring and time-consuming.

Even though the lack of time and, in some cases, skills were the main issues hindering the digitalization of practices, some teachers also expressed some resistance to the public exposure that the use of technology and the Internet might entail. For example, one teacher was worried about having English mistakes in the website, particularly due to the fact that the center was a reference point for the trilingual policy. Some teachers thought that such a platform might also be useful for communicating the homework, so children could check it online and would not need to copy it from the whiteboard (a common issue among dyslexic children).

Precarious working conditions. Most of the teachers had a precarious working condition, which included not having a fixed position, moving among different schools and low salaries. Teachers were usually overwhelmed by additional activities such as support for the school, participation in department board and professional

development activities. Per year, teachers needed to spend 40 hours in additional activities and a minimum of 15 hours in professional development activities. An important issue among teachers was an uncertainty regarding which activities would be accepted as “additional activities”. Also, they did not have a system that recorded or showed how many hours they had done and how many were missing. This uncertainty created a potentially problematic dynamic: teachers became concerned about doing activities that at the end would not be registered and used to give preference to those activities they know they would.

Most of the teachers perceived the professional development activities as an advantage. However, some of them complained about the way they are sometimes implemented. In most of the cases, complaints were related to the quality of the trainer and relevance of the proposed topics to their personal interests. In this respect, teachers would like to be able to make proposals on what to spend these hours. A few teachers spontaneously proposed including activities that would contribute to the development of SPAZIOd as professional development activity.

4.3 Discussion

This paper extends the existing corpus of research on the articulation of matters of concern in technology design [6, 2] by showing how their articulation can be attempted. In our experience, an important aspect is that this articulation entails the triangulation of data obtained through different methods, that enables an exploration of the design space at different levels. On the one hand, the observations of different events allowed us to have a general understanding of the complex political and social conditions [11]. On the other hand, through the interviews, we could identify specific issues that were relevant for many people but regarded differently by different actors. Results indicate that these activities are intertwined and, therefore, should not be considered independently, especially when designing following a public design perspective. For example, the data collected through the observations at events were instrumental in the elaboration of the script used during the interviews and the initial actors in the actor mapping activity. In addition, the data gathered during the interviews triggered the further exploration of the political conditions. For example, the interviews highlighted the existence of a project aimed to enable the early identification of potential writing and reading issues, which was grounded on the 170 law and where the local government, companies, research institutions and some schools collaborated.

An interesting aspect of the concept of matters of concern is that it illustrates issues around which publics can be formed [6, 12]. For example, the lack of practical information on legal and procedural aspects mainly relates to parents, experts, teachers and associations. These actors, or some of them, might eventually get together to face the issue and trigger the formation of a public. In addition, the issue of lack of practical information can be addressed by designing a specific artefact (e.g. a digital platform which supports sharing of relevant information among related actors), which can be considered an opportunity for design. These results suggest that the articulation of matters of concern is an interesting concept, but further research needs to be done to understand how it can facilitate public formation and artefact

creation. In our experience, an important aspect is to engage with activities that facilitate the understanding of the related actors and their relationships. In our study, the actor mapping activity allowed the identification the important role of the mediators to bring people together. The need for mediators also highlighted tensions among actors, particularly between parents and local government, and parents and teachers. Associations could play the role of mediators although it would be important to differentiate between social cooperatives and grassroots communities.

Finally, the results highlighted issues that can be instantiated as design opportunities worth to be pursued. Although they are situated, we still believe that they can serve as inspiration for research that deals with design related to dyslexia. For example, the lack of information with respect to existing technological instruments specifically designed for dyslexic children can help as inspiration for the creation of a digital platform that supports gathering and transferring this kind of knowledge. In this way, technological artefacts are not used to articulate matters of concern [6], but the articulation of matters of concern inspires the development of technological artefacts. In addition, the controversies emerged due to the misunderstanding of dyslexia as a disease or disability can inspire the organization of initiatives that aim to influence the public understanding of dyslexia. Although out of the scope of this paper, this has been the inspiration for the activities following this research. The main one has been the organization of the first “European Dyslexia week” in Italy, which triggered the design and development of several design artefacts and supported the creation of ties among related actors, such as the local government, schools, parents, associations, research centers and the university.

5 Conclusion

The articulation of matters of concern can contribute to addressing the “messy and problematic situations” in which design takes place. An especially interesting aspect of the concept of matters of concern is that it facilitates dealing with issues, rather than solving problems. This approach can be an alternative to many of the current approaches to the design of technological artefacts, which tend to focus on solving problems by means of mobile applications or digital services. In addition, the identification of relevant issues might contribute to the formation of publics. In our opinion, the relationship among the articulation of matters of concern, design artefacts and public formation is an interesting one. Previous research has elaborated how design artefacts can express matters of concern; this paper aims to contribute to the understanding of the relationship between the articulation of matters of concern and design artefacts. A potentially interesting research direction in public design would be investigating the relationship between public formation and artefact design.

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