Sappho Scientific Evidence Platform on Gender: Narratives of Academics and Non-Academics about a Community Science Case

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Abstract

Modern society's digitization has led to the creation of online science platforms. Research shows that academic-oriented platforms boost active research teams, enhance scientific collaboration, and encourage manuscript reviews. However, there is limited research on platforms for citizen participation in science. This study examines the Sappho Scientific Evidence Platform, which aims to provide a science-based participatory tool with a focus on gender-related issues. Using a qualitative communicative approach, 10 users (6 primary school teachers, 2 researchers, and 2 university professors) were interviewed about their platform usage, impacts encountered, and the dialogues between citizens and scientists. The findings reveal that both academics and non-academics can contribute to science on Sappho. Participants reported improved scientific literacy, enhanced conversations about scientific evidence, and the use of this evidence in their personal and professional lives. The platform empowers users to critically engage with gender issues. These results highlight Sappho's positive impact and its potential as a valuable tool for promoting scientific evidence among its users.

Keywords

Plataforma Sappho de Evidencia Científica sobre Género: Narrativas de Académicos y no Académicos Sobre un Caso de Ciencia Comunitaria

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Resumen

La digitalización de la sociedad moderna ha dado lugar a la creación de plataformas científicas. Las investigaciones demuestran que las plataformas orientadas al mundo académico impulsan equipos de investigación activos, mejoran la colaboración científica y fomentan la revisión de manuscritos. Sin embargo, la investigación sobre plataformas para la participación ciudadana en la ciencia es limitada. Este estudio examina la plataforma Sappho Scientific Evidence, cuyo objetivo es proporcionar una herramienta de participación basada en la ciencia y centrada en cuestiones relacionadas con el género. Mediante un enfoque comunicativo cualitativo, se entrevistó a 10 usuarios (6 maestros/as de primaria, 2 investigadores/as y 2 profesores/as universitarios/as) sobre el uso que hacían de la plataforma, los impactos encontrados y los diálogos entre ciudadanos/as y científicos/as. Los resultados revelan que tanto académicos/as como no académicos/as pueden contribuir a la ciencia en Sappho. Los/as participantes declararon haber mejorado sus conocimientos científicos, sus conversaciones sobre las evidencias científicas y el uso de estas pruebas en su vida personal y profesional. La plataforma permite a los/as usuarios/as comprometerse críticamente con las cuestiones de género. Estos resultados ponen de relieve el impacto positivo de Sappho y su potencial como valiosa herramienta para promover la evidencia científica entre sus usuarios/as.

Palabras clave

Participación ciudadana, co-creación de conocimiento, ciencia abierta, plataformas digitales, cuestiones de género

Scientific evidence of social impact is the evidence that has improved society regarding democratically set objectives (Flecha, 2014a). In many areas of knowledge, such as health, education or gender issues, scientific evidence of social impact has generated great improvements in people's lives (Puigvert et al., 2022; Racionero-Plaza et al., 2019; Ramis-Salas, 2020; Rodriguez-Oramas et al., 2022). In turn, the spread of hoaxes through social media and other interactions can have devastating effects in all the mentioned areas (Pulido et al., 2020; Scheufele & Krause, 2019; Yuste et al., 2014).

Increasing scientists, research programs, organizations and citizens are demanding that scientific research has a positive impact in their lives and on societies (Flecha, 2020). The Universal Declaration of Human Rights already states this idea in its 27th article, specifying that: "Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits." Thus, this research and the platform in which it is based are aimed at achieving this right for every individual.

In the field of gender, it has already been studied how programmes addressed to educators, parents, and even children often lack scientific base and are centred on hoaxes. For instance, many programmes with the aim of preventing gender-based violence are based on the idea that romantic love is the ground of gender violence victimization; however, research has already shown this is a hoax (Yuste et al., 2014). Other popular misconceptions include presenting sporadic relationships as non-important for future relationships, which has also been disproved (López de Aguileta et al., 2021). In addition, theories of authors with contrary values to feminism are presented as indisputable referents, such as Foucault or Beauvoir (Valls et al., 2022; Valls-Carol et al., 2022).

These hoaxes in the field of gender have shown to have very harmful consequences in the lives of many individuals. For instance, not warning about the consequences of violent relationships can have long-term negative impacts on girls' well-being and desires (Racionero-Plaza et al., 2019; Torras-Gómez et al., 2019). Some women who had ended up believing that a relationship based on love was not possible have reported non-satisfactory sexual-affective relationships in the present (Torras-Gómez et al., 2019). On the contrary, when evidence-based prevention programs are brought to students, research has shown how they can transform the attraction to toxic intimate relationships and dominant traditional masculinities towards violence-free intimate relationships with non-violent masculinities models (Padrós Cuxart et al., 2021). Although not much research has focused on the analysis of hoaxes in gender issues, some investigations have found the spread of false information through social media with the purpose of damaging the feminist movement (Herrero-Diz et al., 2020). Most research in this area has focused on grassroots campaigns or activism online with issues related to gender (Naik et al., 2020).

Nonetheless, the digitalization and the AI computational technologies that our societies have experienced has also opened opportunities for citizen and community science participation of more individuals, both academics and citizens (Dickel & Franzen, 2015; Newman et al., 2012). The role of community science, i.e., scientific research and monitoring driven and controlled by local communities and characterised by place-based knowledge, social learning, collective action, and empowerment, is increasingly recognised around the world (Charles et al., 2020). Very recent research on citizen science, understood as the involvement of citizens in the

different phases of a scientific Project, is highlighting the pending challenge of meaningfully assigning research tasks to citizen scientists alongside experts and AI computational technologies (Ponti & Seredko, 2022). In order to advance towards citizen and community science, it is also necessary to take into account that social media is nowadays the main source of scientific information for an increasing number of individuals (Höttecke & Allchin, 2020). Furthermore, this digitalization process has led to the creation of science-related platforms. Some examples of these platforms include scientific paper management platforms such as SNS, where academics gather according to their research fields and create collaboration networks (Ma et al., 2011), or the university scientific research management platform focused on providing support for research activities and decision-making for teachers and scholars (Yang & Li, 2014). On the other hand, the Digital Ocean Project has provided research teams and individual researchers with a collaboration environment (Caron et al., 2011).

Such platforms allow researchers from all over the world to find, consult and debate the latest scientific evidence in different fields, facilitating the promotion and development of scientific contributions that improve citizens' lives. Still, it is not enough to open up platforms and spaces for scientists to consult and share scientific evidence. It is necessary for these to reach all citizens and to include them as active participants. Indeed, this is increasingly becoming citizens' claim (Soler & Gómez, 2020), and new opportunities and experiences of co-creating scientific processes are happening to respond to such demand. As explained by Boho and colleagues (2020), the advances in smartphones are now enabling citizens with the tools to collaborate in the creation of, for instance, plant identification algorithms through collecting the specimens that surround them.

Co-creation in science is therefore important for improving scientific methodologies and contributions and to achieve social impact, that is, to improve citizens' lives (Aiello et al., 2021; Flecha, 2014b; Gómez et al., 2019; Roca et al., 2022). In this regard, the scientific, political, and social impact achieved through the communicative methodology (Gómez et al., 2011) was pioneer in this co-creation concept and in the achieving of social impact, and now it is what the European Commission requires for all projects funded by its Framework Programme to incorporate as their basis (European Commission, 2022). It is therefore researchers' responsibility to promote social impact (Flecha, 2020; Van den Besselaar et al., 2018) through our research findings and to engage citizens in the co-creation of such findings through different dialogic spaces.

A whole body of research from different fields is providing evidence on how researchers engage citizens in this co-creation of science, gathering their voices and engaging in dialogues both through in-person (Casado et al., 2021; Racionero-Plaza et al., 2021) and online (Oliver et al., 2021; Pulido Rodriguez et al., 2021; Redondo-Sama et al., 2021; Valls-Carol et al., 2021) interactions. However, there is yet insufficient evidence about scientific platforms for citizen participation in science and its potential effects. Thus, the present research is focused on a participatory scientific platform about scientific evidence on gender. The objective of the investigation is analysing the impact of the Sappho Scientific Evidence Platform on Gender in both the interviewees and their surroundings.

This framework includes the current case study, which aims to foster citizen participation in scientific research. Specifically, it is focused on two Sustainable Development Goals:

Quality Education and Gender Equality. This research is related to the second goal, by analysing the engagement of citizens in science by fostering awareness of its social impact.

Methods

In order to study the impact of Sappho on different users' profiles, it has been conducted a qualitative research focus on 10 academic and non-academic individuals (university professors, researchers and primary school teachers) from whom interviews with a communicative approach were collected. Following the communicative approach (Gómez et al., 2011), the interviews consisted in establishing an egalitarian dialogue between researchers and participants to share and reflect on how participating in Sappho has impacted them and their context.

The interviews were conducted via Zoom or phone calls and were audio-recorded. Without following a script but rather being communicative and dialogic, the interviews revolved around how they used the platform, which are the impacts they have encountered both for them and their surroundings and how citizens and scientists engaged in dialogue in these debates.

Sappho Scientific Evidence Platform on Gender

The research was done with users that contributed to the Sappho Scientific Evidence Platform on Gender (https://socialimpactscience.org/gender/). It is a citizen platform based on scientific evidence in the field of gender. Every participant can contribute by providing scientific evidence, or with their doubts, or experiences.

Each user can contribute with posts or comments to the already existing posts. Posts contain statements that users have heard and want to check whether they are backed by scientific evidence, or whether they are hoaxes. This way, a person posts one statement they have heard, and provides a brief explanation. For example: "Glamorizing prostitution and traffickers increases sex trafficking". After the statement, a debate is created where users comment with scientific articles or experiences. However, it is necessary to have at least three indexed scientific articles (whether in Scopus or in Journal Citation Reports) to be considered scientific evidence or a hoax. If scientific evidence is found on both sides, the statement is considered a scientific controversy. On the other hand, if not enough evidence is found, it is categorized as needing more evidence. It must be clarified that these categorizations (scientific evidence, hoax, scientific controversy or needs more evidence) are flexible and changed if new evidence is presented.

Participants

Participants of this study include both scholars and non-scholars who are users of the Sappho Platform. They are five men and five women aged between 25 and 45 years old, and all of them have higher studies. Table 1 shows the main features of participants.

Table 1

Participant Profiles

Participant	Age	Sex	Educational level	Profession
John	40 - 45	Male	PhD	Associate professor
Amelia	40 - 45	Female	Bachelor's degree	University teacher
Hannah	30 - 35	Female	PhD	Researcher
Sophia	25 - 29	Female	Master's degree	Researcher
Peter	35 - 39	Male	Bachelor's degree	Primary teacher
Emma	40- 45	Female	Master's degree	Primary teacher
Charlotte	40 - 45	Female	Bachelor's degree	Primary teacher
Noah	40 - 45	Male	Bachelor's degree	Primary teacher
James	40 - 45	Male	Master's degree	Primary teacher
Lucas	40 - 45	Male	Master's degree	Primary teacher

Data Analysis

Interviews were transcribed and analysed by the researchers. Each researcher read and categorized the data, and then the results obtained by everyone were discussed to reach a consensual interpretation on: (1) how they used the platform, (2) which are the impacts they have encountered both for them and their surroundings, and (3) how citizens and scientists engaged in dialogue in these debates. Following the communicative approach to co-creation of knowledge in research (Gómez et al., 2011), once the research team defined the main findings, these were presented to the interviewees to ensure that the interpretation of these did not contain any deviations from what they had said.

Ethics

All participants were given and signed an informed consent to participate in this study. The consent form included all the information about the study and its objectives, the aim for scientific publishing of the results, how their data was going to be managed, the anonymization of all personal information, and the voluntary aim of their participation with the possibility of withdrawing from it whenever they desired. All names used for interviewees are pseudonyms. The study was conducted according to the guidelines of the Declaration of Helsinki and all procedures performed in this study were in accordance with the ethical standards of the university. Ethical clearance and approval were granted by the ethic committee of the university coordinator.

Results

Results of this study show that the 10 participants saw the Sappho Scientific Evidence Platform on Gender as a tool for getting to know the scientific evidence in gender, and a way of not believing in hoaxes in this field. The information they accessed was also applied to their daily practice as professionals and in their personal lives. Moreover, both academics and non-academics were able to contribute to the scientific discussions and participants regarded the platform as a way of democratizing science, through a dialogue between citizens and researchers.

Accessing Scientific Evidence on Gender

All 10 participants gave a great value to being able to distinguish statements and ideas based on scientific evidence from hoaxes through Sappho. They valued not being subject to just popular trends in gender and having an informed view on what was being said in this field. This sensation was not only evident in them, but also in their surroundings.

Enhancement of Scientific Literacy. Distinguishing Hoaxes from Scientific Evidence

All participants explained that, thanks to Sappho, they were in fact more capable of distinguishing trends and hoaxes from scientific evidence on gender. Sappho responded to a need of many individuals (families, university students or teachers) to access a place where they can check whether the information they hear in their everyday lives about gender issues is evidence-based or they are hoaxes, according to participants. For some interviewees, this is a demand that has been made for a long time. As Peter stated:

> Since I am more involved in training issues and in centres and in networks that bring together staff from different centres, many people who start to learn about scientific evidence in education or things related to education as is in this case gender, very often say, "but why can't there be a site where I can consult the evidence?" (Peter, primary teacher)

For instance, Hannah, a researcher teaching as an assistant professor, stated that some university students have demanded they want to distinguish evidence from hoaxes in the field of gender. Thus, she has used the platform as a tool to answer to her students' requests.

> Expectations of the class: "To differentiate between what was true and what was not true". And this concern was something they were very clear about and that is where I introduced that yes, indeed there were many hoaxes... and that in this class we would help to discern, right? Between what is evidence and what are hoaxes... what is reliable information and how to obtain it from what is not, right? And of course, the activity of the Sappho platform fit perfectly because it started from a need they had, right? (Hannah, researcher)

This impact also reached the primary school where some users of Sappho such as Peter use the knowledge acquired there to choose teacher training based on scientific evidence on gender.

Peter is the coordinator of in-service teacher training at his school. Using the Sappho platform has helped him to select for his school's teachers only courses on education and gender that are based on scientific evidence.

> Where I think it will have more impact will be, as I was saying, in the very near future because, for example, I am the training coordinator at my centre, and I am in close contact with the teacher training centre. And sometimes they offer me things and I have more and more confidence with them and sometimes they tell me: "Look at this training on coeducation which is very good... or... look at this guide which is very good" And... There are more and more... It is more likely that I can direct them here (Sappho platform) and I can tell them... "We are not interested in that for our centre" I don't know, it is very practical for me to be there. (Peter, primary teacher)

John, an associate professor, argues that Sappho is helping to address issues of gender violence more rigorously in dialogues with journalists, citizens and even in academic settings. According to him, it serves academics to provide evidence in citizenship talks or university lectures.

> For example, I think it is helping, I think, in the little that we have been doing, to go a little more into detail and be more rigorous in gender. That in gender there are many people who talk in the press about topics without knowing. And then that is a way of becoming familiar with scientific discourse (Sappho platform). That seems to me to be very important because it is also to become familiar with science in the dialogues and among scientists. Not only what we affirm in gender we affirm about ourselves but also because we contribute articles, evidence, percentages, and that is being useful for example in talks, in class... It is being useful to change that way of approaching the topics of gender violence. (John, associate professor)

Gain of Empowerment and Confidence in Their Arguments and Positioning

The interviewees said they gained in confidence and that they were empowered to defend their positioning in certain topics because they knew they were backed by scientific evidence. Knowing that it was not only their opinion, but scientific research had shown it, encouraged them to spread such evidence and put it into practice in their professional positions. For instance, Peter, Primary teacher, explained how he applied, with his six-year- old students, evidence-based educational actions on the preventive socialisation of gender violence from an early age that he has accessed through the platform. Accessing these evidence-based educational actions through this platform has helped him to gain confidence in arguing why he applies them and how these benefits his students, for example, when he is explaining them to families.

> It helps me a lot (...) as for example in my work. In the primary school and many times, the way I work with children or if I give a lot of importance to an aspect related to gender, to preventive socialization or whatever...the existence of these platforms helps me a lot to justify it in case sometimes a family doesn't see it. And they say: "why are we always doing this? they are 6 years old", right? So, the fact that this exists (Sappho platform), it's very good for us. (Peter, primary teacher)

Noah, Primary teacher, emphasizes how, although he already applied evidence-based practices in the field of gender in his daily practice, Sappho provided an easy and quick way of showing and providing the evidence if asked about it.

> For me personally, it clarifies many things and not only clarifies but also gives me the resource to collect that evidence to demonstrate it because many times we say: "There are a lot of scientific evidence that say so and so and so and so" but many times we do not say where they are and what they are, right? And when you see them and they are there and you see that there are a lot of them, it is a wonderful thing. (Noah, primary teacher)

This growth in confidence was not only for teachers, but also for researchers. Amelia, university teacher, claims that the Sappho platform strengthens the arguments of researchers conducting ethically engaged research in academic contexts where work on gender is often based on hoaxes rather than scientific evidence. Maintaining themselves firmly in spite of the pressure to follow non-critically the trends is easier with the debates and arguments given in the platform.

> People who are doing very ethical research I think these platforms give them support. Because since it is based so much on argumentation, everything that exists, especially in gender (...) all the barriers that we have (in academic settings), especially in Spain, are based on myths, right? and on little contrasted ideas, I think that it is clear what is a hoax and what is not helps ethical researchers. It gives them strength, because when anyone else reads it, they see the arguments very clearly. (Amelia, university teacher)

Personal Reflection of Relevant Topics for Them and Their Surroundings

The evidence collected and discussed in the Sappho platform has also aroused personal reflections on topics of great relevance to one's life. It is the case of Amelia who uses the platform also to reflect critically about her personal relationships and family:

> I also read it and think more on a personal level, it helps me to reflect on those things that concern me personally. That is, I read it and it educates me or helps me to think about myself... or to be more critical. (...) For a family issue, for my children... for a couple... (Amelia, university teacher)

The impact of participating in Sappho for one's personal relationships has been recurrent in the interviews. Knowing the evidence and discussing it in the platform had a positive impact on relationships of participants, as James explained.

> Everything that is knowledge and evidence (...) helps you to be more critical of what is happening (...) and helps to transform relationships. The more people there are in the debate and in the dialogue, the more situations will be prevented or solved. (James, primary teacher)

Other participants also stated how these reflections open a door for other people to take a stand against gender discrimination. For example, in relation to evidence on the relevance of

standing with the victim of gender violence and not creating situations of re-victimisation, Charlotte, primary teacher, believes that the Sappho platform will help citizens to be active bystanders against gender violence and taking a stand on the side of the victim.

> To the extent that they [the platforms] dismantle opinions that are not based on anything and that perpetuate or revictimize even more the victims of gender-based violence, they will also generate other attitudes and other more supportive and active positions towards the victims when it comes to preventing gender-based violence. (...) It will generate the possibility that people will position themselves more on the side of the victim. (Charlotte, primary teacher)

In the case of Hannah, a researcher and university teacher that used the Sappho platform in her lessons, she mentioned how her students reflected on their own intimate experiences. In this case, some of them shared experiences of violent sporadic sexual relationships after seeing the evidence of a post that showed it was a hoax that there was less violence in sporadic relationships than in stable ones.

> I have to say that of those who shared experiences I understand why they would not publish them because they were very generous and very brave in the experiences they shared. Specifically, there was a post about... something like that about violence in sporadic relationships... right? And... Oh, wow, of course, she gave some impressive accounts of effectively confirming that this could be said, right? And confirming how she had witnessed violence in dating relationships as well, right? Not just in long-term relationships and how she could identify that. (Hannah, researcher)

Dialogue Between Scientists and Citizens

One of the things that the participants interviewed valued the most about Sappho was to be able to democratically participate in science. It served to enhance a dialogue among citizens and scientists, in a way where both agents contribute to science. Some of them, in the beginning, thought they would only use the platform to consult certain information, but not to contribute. On the contrary, they saw an opportunity for real democratic participation in science.

> I was surprised [by the different modalities of consultation and intervention] (...) Maybe at the beginning when I heard about the initiative, I thought it would be just that, right? of consultation and so on. But the fact that it is possible to comment, debate, counter-argue... I think it is really democratic. (Peter, primary teacher)

Researchers also saw benefits of the platform because it connected them with other researchers and enabled interaction among them, to see how certain topics were being researched, as Hannah and Amelia explained:

> Here you even have the possibility of interacting with other people who also do research and may know or have doubts or even with the person who has written the article who could participate at any given moment. (Hannah, researcher)

So, at the level of impacts during this first year, above all as a place for consultation, that is, when I have a doubt or want to know how this topic is going, or how it is being approached, or what reflections there are, I go there to see. (Amelia, university teacher)

In this vein, participants did not see a hierarchical relationship among citizens and researchers. Especially those who were not involved in scientific research saw their opinion and life experiences as very valuable in the platform, where researchers could also improve their practice by seeing such contributions. As Charlotte and James stated:

It gives citizens the possibility not only to go and read about them but also to contribute with their experience along the lines of what they are saying. And so, I believe that this is also a way for me as a citizen to contribute my bit in science. (Charlotte, primary teacher)

So, anyone can benefit from what I contribute to this evidence, and what this does is enrich the evidence with experiences, which is also a lot of research, right? (...) The experiences of the people are like a direct link, right? Between research and people's daily lives (James, primary teacher)

Researchers interviewed also were aware of the benefits of participating equally with citizens, both in how the scientific evidence arrived at more people and in how it enriched their own research. This way, a participation in science was seen, as well as a more inclusive communication of science, for instance, in social media.

It surprises me how people give it a lot of value and make it their own. It invites other people to the debate (...) You see for example tweets from people, and you say: Wow, it's kind of cool that it's not the scientists who are there all day long promoting it. Because it's not... you know... it does not come from above and we are the ones who have to tell people what they have to give their opinion about or debate. It's the people who write on the platforms and then promote the debate on these issues and I think that's cool. (Sophia, researcher)

Discussion and Conclusion

Scientific research is increasingly focusing on the one hand, on creating opportunities to foster community science and, on the other hand, counteracting the spread of false information through social media, due to the possible very harmful effects. In the field of health, this has been very evident and already studied, especially now during the COVID-19 pandemic (Puigvert et al., 2022; Pulido et al., 2020; Pulido Rodríguez et al., 2020). Nonetheless, this study contributes to the yet underexplored field of scientific evidence on gender in social media.

In the Sappho Scientific Evidence Platform on Gender, users share and discuss statements they have heard and democratically establish, based on the presented scientific evidence, whether they are hoaxes or are indeed backed by science. Participants from the study used the information they gathered in the platform in their daily lives, both in their professional practice and their personal issues.

This is a case of community science in which the academics and non-academics participants alike reinforced their knowledge of gender-related issues by reading and discussing the scientific evidence, which gave them a greater independence and critical view when deciding which actions to apply in their professional practice. This gave greater freedom not to follow trends in gender indiscriminately. On the contrary, the platform gave them (and their contexts) arguments to base their decisions on scientific evidence in gender. These findings are of great relevance, as the spread of hoaxes in gender, which even affecting children at an early age through unscientific violence prevention education programmes, can have very negative consequences in the lives of individuals (Ruiz-Eugenio et al., 2020; Torras-Gómez et al., 2019; Yuste et al., 2014). Surroundings of participants, which include university students among others, have been able to reflect about widespread hoaxes in gender, such as the statement that there is no gender violence in sporadic relationships. Breaking this myth and reflecting about one's past through knowing the scientific evidence has a great social impact where many victims of such violence have shown to free themselves and improve their well-being (Racionero-Plaza et al., 2019, 2020).

The participants not only consulted the platform to check their doubts; they also shared information, experiences and, in the end, their knowledge from their life worlds (Garcia Yeste et al., 2018; Gómez et al., 2019). Primary teachers and researchers participating in the study valued greatly the possibility to engage in an egalitarian dialogue. They stated that not only did they learn more on the platforms, but science was co-created and improved by this dialogue. These findings are in line with the main demands of societies and research programs: co-creation of scientific knowledge (Flecha, 2020).

Limitations

Some limitations must be acknowledged. All participants were involved in education to a certain degree; thus, future research should be carried out to find the impact of the platform in other profiles. Similarly, future research should include individuals with a lower educational degree and from diverse cultural backgrounds.

Acknowledgments

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