Boosting, not replacing
Online deliberation tools in a face-to-face student citizens' assembly

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This article investigates the cautious digitalization of a deliberative process that had taken place face-to-face and re-evaluates the benefits of online deliberation in the post-COVID era, where hybrid processes have multiplied. Our study focuses on how specific online deliberation tools can be used to complement offline deliberation. Certain functionalities can be combined with face-to-face deliberation to expand the range of deliberative tactics and enable deliberative processes to proceed with features that are less convenient offline.

The analysis focuses on two software programmes specifically designed to facilitate high-quality online deliberation: Decidim and pol.is. The authors used these tools in the context of a university mini-public – a student citizens' assembly at Université Paris Est Créteil – which they helped organize. These tools provided features that advanced the various stages of the deliberative process, which took place mainly offline. This study explains how these tools, based on their affordances and use of their functionalities in designing the deliberative process, boosted face-to-face deliberation by enhancing the pedagogy, inclusivity, comprehensiveness, transparency, continuity, legitimacy, and accountability of the process, without resulting in online deliberation per se.

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This article investigates whether the cautious digitalization of a deliberative process that had taken place face-to-face could help go beyond the literature dismissing online deliberative methods for their poorer quality compared to face-to-face deliberation. We indeed would like to re-evaluate the advantages of online deliberation in the post-covid era when hybrid processes have multiplied. The focus of our article is on the way specific online deliberation tools can be used as instruments to further offline deliberation. Some functionalities can be combined to face-to-face deliberative sessions as they broaden the repertoire of deliberative tactics and allow deliberative processes to proceed with features that cannot take place as conveniently offline.

Our analysis focuses on two different software specifically designed to allow for quality online deliberation: Decidim and pol.is. We, the two authors, have used them in a specific context of a university mini-public – a student citizens' assembly – which we have contributed to organize. They have provided features which have furthered the different stages of the deliberative process, which took place mainly offline.

1.   Introduction

Over the past decades, the deliberative theory of democracy has contributed to the renewal of debates in political philosophy regarding the conditions for the exercise of democracy and its forms of legitimacy. The deliberative theory of democracy proposes a rethinking of the modalities of expressing the "general will" and the inclusion of "deliberation of all" (Manin, 1985). This "deliberative imperative" (Blondiaux & Sintomer, 2002) has generated an imperative to define the technological and political conditions for the exercise of collective deliberation within political decision-making processes. Citizens' juries, citizen panels, deliberative polls, and citizen conventions are examples of recent democratic participation processes designed to enable citizens to deliberate and participate in decisions and public policies. Some tools developed by information and communication technologies facilitate an explosion of knowledge sharing globally through large-scale conversations. Forums, blogs, and social networks are used to mediate large distributed conversations and, in the case of wikis, produce collective knowledge in the form of shared texts. In particular, we focus on one of the devices often associated with deliberative democracy: digital citizen participation platforms. These platforms are interfaces

that allow a large number of people to discuss common issues and formulate solutions regarding complex and controversial issues (e.g., climate change, migration, a country's economy). The rise of digital participation platforms opens avenues to broaden the circle of individuals involved in deliberations, moving from small groups to crowds.

In this article, we investigate how and why dedicated online deliberation software can be used in the context of a deliberative device emphasizing face-to-face discussion. We define deliberation as Landemore (2012) and Manin (2005) do: deliberation is a mental action that consists in weighing up arguments carefully with a view to making a decision. Collective deliberation is the process of confrontation and collective evaluation of the strength of arguments. During this process, the group generates ideas or arguments and evaluates options in order to make a choice or solve a problem. Deliberation has four core pillars: inclusiveness, rationality (giving reasons that all can accept in pursuit of the common good); reciprocity (a commitment to listen to others, take their views into account and therefore respect them as moral equals in the decision-making process) and flexibility (citizens are open to the force of the better argument, and therefore to being shaped by the deliberative process itself). Deliberation is a process that can occur in many different contexts and cover a wide range of subjects. It may include topics such as public policy, social, environmental, economic, technological, and ethical issues. The context of deliberation in which we find ourselves is a citizens' assembly. Citizens' assemblies are mini-publics gathering a randomly sorted group of citizens to deliberate on policy solutions to pressing public problems (Smith, 2009). In our case, the participants are students whose participation is made compulsory because the process takes place during class time. This allows us to avoid self-selection while ensuring stable presence in a university where half of the students have a professional occupation. A well-known challenge with mini-public deliberation is how these micro-level processes can be scaled up, or integrated into wider systems of representative politics, and what the impacts are on the maxi-public - those outside of the assembly (Curato & Böker, 2016). In order to play a positive role in democratic polities, these deliberative processes need to gain resonance beyond the deliberative mini-public itself and inform public debate more widely (Setälä, 2017). In the case of the student citizens' assembly, the maxi-public mainly corresponds to the larger student body as well as the administrative and academic staff.

Most of the literature devoted to online and offline deliberation have a comparative perspective (Pina, Torres & Royo, 2017; Yetano & Royo, 2017). Our intent in this article is not to compare deliberation when taking place online or offline but to investigate the use of hybridization. Opting for the additional use of Decidim and pol.is in the student citizens' assembly was based on the hypothesis that it would improve operationalization, enable the expression of disagreement (Rossini & Maia, 2021) and plurality of perspectives (Annunziata, 2016; van der Does & Bos, 2021), contribute to making the exchange of arguments as equal and transparent as possible - which is the the main goal of the design of deliberative devices (Karpowitz & Raphael, 2014) – and that it could improve the democratic legitimacy of mini-public decisions as regards the maxi-public (Gastil, 2021).

2.   Case study: the student citizens' assembly

The student citizens' assembly (SCA) is a deliberative experiment that aims to involve students and give them a voice on the complex issue of transitioning to sustainability. The University of Paris-Est Créteil has organized a SCA delving into a different theme every year since 2021. The process transposing the French Climate citizens' assembly to UPEC was first co-designed with Master students from the Institut d'Études Politiques Fontainebleau - UPEC. The aim of the mini-public (450 Bachelor and Master students in political science, IT, energy and environmental biology engineering as well as digital law divided into deliberative groups of 10 with one moderator) is to reflect, problematize, raise awareness and act on our environmental impact through making concrete proposals for living in a more ecological and inclusive society at the level of the university (42,000 students) and beyond. The purpose is to decide what sustainability is and how to become more sustainable in a democratic manner, through changing the decision-making process and questioning hierarchies existing in academia (between students and academics, between subjects, research and training, expertise and lay knowledge etc.). The first SCA focused on food, with a systemic approach integrating environmental, health, political, economic and social issues. Its mandate was to define a series of measures that would lead to the creation of an alternative food system on university campuses and in their surroundings. By participating in this decision-making process, students were taking part in a process of horizontalization to resolve an imperfectly satisfied need. In the fall of 2022,

the second SCA focused on the sustainability of our digital practices through proposals, measures and recommendations decided in a democratic and horizontal manner through four themes: inclusion, education, citizenship and health. Students also worked on two fundamental umbrella themes – the impact of digital practices on the environment, and on their impact on rights and fundamental freedoms.

The first meeting of the second SCA took place from 10 to 12 October 2022 in Fontainebleau. During this first meeting, the participants received training through conferences, roundtables and testimonies. They exchanged, debated and formulated a first series of proposals to respond to the challenges linked to digital technology. During the second deliberation phase, which took place from 13 October to 7 December 2022, students gathered in subgroups and shared their work online on Decidim (presented in the next section), in the direction of participants mainly, but also of guests, partners and decision-makers, and anyone from the maxi-public who was interested in following the process. During this phase, participants not only discussed and amended the first text of proposals drawn up at the end of the first meeting, but they were also able to submit new proposals. During this deliberation phase, numerous events were organized and various thematic meetings allowed participants to continue the reflection initiated in the different working groups. These workshops took different forms, such as deliberations, conferences, forum theatre[3] or hackathon[4]. They were sometimes organized with partners and secondary schools in their premises, but mostly on the university campuses in Créteil, Fontainebleau and online. The third and final stage of the SCA was held on 8 and 9 December in Créteil. The closing days allowed participants to complete their work and vote on a set of ambitions, proposals and measures.

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3   Forum theatre is one of the techniques under the umbrella term of Theatre of the Oppressed created by Augusto Boal. In the SCA, forum theatre begins with a short performance, written and rehearsed by (former) participants, which presents social or political problems. Forum theatre allows spectators to collaborate in the experience by becoming 'spect-actors' (the audiences who participate in the actual performance). Through a moderator (joker) and the active engagement of spectators, the play begins again with the audience replacing or adding to the characters on stage to present alternate solutions to the problems faced.

4   The hackathon organized during the second SCA brought together political scientists and engineers, who worked intensively during 17 hours in subgroups on projects identified during the launch of the SCA.

Two specificities of the SCA must be highlighted: the public is relatively homogeneous in terms of location, age and education. Besides, students are neither drawn by lot nor self-selected. Participation is compulsory for students because their participation to the SCA has been formally integrated in the curriculum.

The SCA incorporated digital tools to facilitate citizen engagement and participatory decision-making: mieuxvoter.com (using majority judgment to vote), Discord (to communicate), HackMD (to create an online library of resources), Decidim and pol.is. The following section provides an overview of these online tools which lays the groundwork for understanding how these technological platforms contribute to the dynamics of participatory democracy within the context of the SCA. We present detailed descriptions of Decidim and pol.is elucidating their features, and their synergistic integration.

3.   Description of the online tools

Decidim and pol.is are tools designed to facilitate citizen engagement and participation in decision-making processes. They provide digital platforms where individuals can express their opinions on various matters, contributing to democratic discourse. Both platforms aim to empower citizens by offering spaces for active involvement in discussions and decision-shaping processes that impact their communities. In this section, we undertake a comprehensive exploration of essential components of Decidim and pol.is by explaining the features of these tools, what they have in common, and their differences.

3.1.   Decidim and the features used during the SCA

In 2016, Barcelona's City Council created Decidim, an open-source software that has become a leading tool for digital democracy in Europe. Barandiaran *et al.* (2018) define Decidim as a "web environment (a framework) produced in Ruby on Rails (a programming language) that allows anybody to create and configure a website platform to be used in the form of a political network for democratic participation". The platform allows organizations like city councils, universities, neighborhoods, cooperatives or governments to create processes for "strategic planning, participatory budgeting, public consultation, collaborative design for regulations, urban spaces and election processes" (Barandiaran *et al*., 2018). Decidim was designed to empower citizens

by providing them with a platform to voice their opinions, contribute to policy development, and collaborate with government institutions. The software was devised to strengthen democracy by fostering transparency, inclusivity, and citizen participation in decision-making processes. Decidim is also a community of researchers, developers, and specialists in citizen participation who constantly improve the tool, with innovations benefiting the MetaDecidim community.

In this section we describe two types of features used on Decidim during the SCA: the participatory and informative features. The participatory features of the Decidim platform encompass a range of elements specifically designed to engage users actively in the decision-making process. They aim to empower individuals and enable them to meaningfully take part in the democratic discourse.

1. The "Proposal" feature on Decidim allows participants to submit their ideas and suggestions in an online format. These proposals can include various elements such as text, photos, files, and geolocation tags. The platform organizes these submissions by categories, providing a structured and accessible way for participants to navigate and explore the diverse range of proposals. This feature ensures that the submitted content is visible to all participants, promoting transparency and facilitating a comprehensive understanding of the proposed ideas within distinct thematic categories. The commenting feature on Decidim is a versatile tool that empowers users to engage in interactive discussions. Participants can add comments to express their opinions, and others can react to these comments, indicating whether they are in neutral, in favor, or against them. This valuation system provides a quick and visual way for users to gauge the level of support or opposition for a particular comment within the community. Moreover, participants can vote on comments, allowing for a more structured and quantifiable way to measure the collective sentiment toward specific ideas or proposals. This democratic voting mechanism ensures that popular or impactful comments receive recognition within the platform.

2. The amendment and merging features were used on the participatory platform of the SCA. In the official Decidim documentation,[5] it is suggested that "with the amendment feature, participants can propose changes to an already published proposal". Grouping proposals on Deci-

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5   The official documentation is accessible here: https://docs.decidim.org/en/develop/admin/components/proposals/amendments.html

dim serves to organize and structure ideas submitted by participants. It involves creating categories or themes to cluster similar or related proposals, helping the coherent management and analysis of contributions. This functionality enhances the efficiency of the decision-making process by facilitating the identification of common concerns or emerging ideas within the participating community. The grouping feature plays a crucial role in bringing order and structure to the diversity of opinions and suggestions expressed on the platform.

3. The Official Responses feature allows platform administrators (i.e., organizers of the participatory process) to respond to proposals directly from the back office. This includes assigning one of three statuses to proposals: accepted, under evaluation, or rejected. Additionally, administrators can provide notes explaining the reasons for the assigned status, promoting transparency in the democratic process. This feature offers a structured and official means to manage interactions between organizers and contributors within the participatory platform.

4. The Accountability feature on Decidim allows to monitor the progress and implementation of proposals generated during the SCA. It is quantified by assigning completion percentages to the actions undertaken. This functionality provides a clear overview of the concrete tracking of ideas put forth during the convention, enabling participants to monitor the evolution of the implementation of their proposals over time. Completion percentages are displayed at three distinct levels: at the individual proposal level, at the proposal category level, and at the overall level, thereby offering a detailed understanding of the overall progress of the participatory process.

In addition to the participatory tools, the Decidim platform incorporates informative features designed to enhance the overall transparency and communicative aspects of the participatory process. The informative features play a crucial role in keeping participants well-informed, creating an environment conducive to open dialogue and informed decision-making throughout the participatory initiative. The Decidim platform used in the SCA included the information components that follow:

5. The Social Media Sharing feature on Decidim enables the widespread distribution of proposals across social networks. It empowers participants to share their ideas, suggestions, or proposals directly on popular platforms like Facebook, Twitter, and others. This functionality fosters a broader reach for contributions, engaging a wider audience and promoting participation beyond the Decidim platform. In essence,

this feature serves as a tool to amplify and share the proposals generated within the participatory community.

6. The News feature on Decidim allows the creation of articles highlighting the latest developments on the platform and updates related to the ongoing consultation. Moreover, the platform emphasizes the most commented articles, providing visibility to discussions that generate significant engagement within the community.

Decidim provides other features. Except for surveys, they were not utilized in this participatory process, including participatory budgeting, meetings, and sortition.

The Decidim platform also allows for exploring new ways of combining tools enabling experimentation with new deliberation methods: we have integrated the online tool pol.is on Decidim with an IFRAME feature[6]. As students logged into the Decidim platform, they were presented with the opportunity to navigate the pol.is tool. This integration allowed them to seamlessly transition between the functionalities of both Decidim and pol.is, enhancing their engagement and participation in the deliberative processes of the student citizens' assembly.

3.2. Description of pol.is and its main features used during the SCA

Pol.is is an interactive survey tool to identify in real time the different ways in which groups of people think about a subject. The software has been developed in the United States and primarily used in Taiwan, a pioneering country in the field of digital deliberation (Frenkiel, 2017). It enables the identification and real-time visualization of the distribution of opinions within a group. What do pol.is users do?

1. Users interact in real-time on the pol.is interface by writing proposals online and voting on submitted proposals. Users generate statements, and others indicate their stance using buttons. Participants are encouraged to provide concise, stand-alone comments, limited to a maximum of 140 characters. This format promotes brevity and facilitates quick exchanges of opinions within the platform.

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6 The IFRAME feature is an HTML tag used to embed another HTML document within a web page. It allows the display of content from another web source within the current page, creating a window or frame that can showcase content from an external URL. This enables seamless integration of dynamic content, such as the pol.is tool, from other websites directly into the current page, such as the Decidim tool, without the need to load a separate page.

When participants vote on a proposal, there are three possible statuses: agree, disagree, or neutral/uncertain.

2. From the proposals submitted by others, users can also enter their own statement for others to take a position (Barry, 2016). It is important to distinguish pol.is from discussion forums or free online discussion spaces. Unlike these platforms, pol.is does not allow for comment threads. In fact, participants' comments are not visualized as responses related to the proposals of other participants.

3. Based on the votes cast, participants are categorized into clusters (or opinion groups). Each cluster is made up of a group of participants who tend to vote similarly: within these groups, a set of proposals therefore reaches a consensus. Pol.is collects and analyzes the votes in real time using statistics and machine learning and creates the visual representation of the evolution of the distribution of opinions over time. Depending on the votes, clusters may form or dissolve. The evolution of the clusters can be tracked visually through their size and geographical proximity. Larger clusters represent more members, while greater distance between clusters and participants indicate greater divergence in the opinions of their members. Pol.is does not offer semantic analysis; the content of student contributions is not analyzed. The algorithm focuses on aggregating and visualizing the patterns of agreement and disagreement without delving into the specific meaning or interpretation of individual statements.

4. The administrator has the option to control participants' access to the consensus and dissensus map: they can decide to provide or restrict access to this visualization. During the pol.is experiment of the SCA, participants could watch the evolving map of opinions as they voted.

5. Pol.is automatically generates a report that is available in the back-office of the software for the administrator. This report contains a statistical analysis of participation (the number of people who voted, the number of people grouped together, the number of votes that were cast, the average number of votes per voter, the average number of statements per author). The report also contains the list of the proposals that most people agreed with. Finally, the report presents the specificities of groups of opinions: it shows proposals that create separate groups. Thus, it shows statements which make each group unique by their votes.
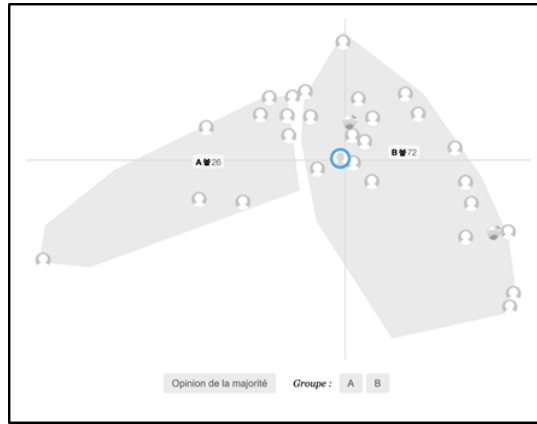
Figure A. *Final visualization of the pol.is session on the subject "can online courses replace face-to-face courses?". People who voted similarly are grouped together. Participants can click on the group to find out what other members think*

Pol.is differs from Decidim in the way users interact, specifically how they share ideas and opinions. Pol.is collects opinions to map them and create consensus through intense interaction between participants. In general the form of interaction between participants deliberating online is asynchronous: participants make proposals, respond to comments or vote at different times. On participation platforms such as Decidim, participants express their opinions but mutual interaction is unlikely to occur (Kenshi *et al.*, 2021) while Pol.is encourages mutual interaction and a high degree of information sharing between participants. Instead of commenting in threads, participants of the SCA were asked to read and to react to a maximum of free-standing and very short comments in a simultaneous way, during on-site workshops. Decidim and pol.is were therefore used in a complementary but converging way during the SCA.

4. Implementation of the online tools during the SCA

The SCA is a hybrid deliberative process. The training and the deliberation however took mainly place face-to face, which was a deliberate choice especially after the experience of several Covid lockdowns, even when our topic was digital uses. Our case study, the second edition however relied heavily on Decidim and pol.is.

4.1. Decidim's Role in the Deliberative Process: Stages and Impact

Decidim has been used in four of the five stages of the SCA. It was not used during the initiation, when the opportunity of organizing a mini-public was being discussed. But it was used in the designing stage (metadeliberation), when students co-designed the adaptation of the climate citizens' assembly to their university setting, and the information stage, when students were informed about their participation to the SCA. It was used in the deliberation stage, but only from the third day on. It has also been instrumental during the last stage, the integration and monitoring of proposals, where the outcome of deliberations and impact on public policy can be traced.

Decidim was chosen for its deliberative features (proposition module), which have been used during the fourth stage (deliberation) of the SCA, which we are going to detail now.

The "Proposals" module of Decidim was used to collect proposals. Participants could like, follow, and comment on other participants' proposals.

Figure B. *One proposal made on Decidim "Creating a digital second-hand toolkit"; https://decidim.u-pec.fr/processes/CCE2/f/49/*

The SCA was designed to combine face-to-face deliberation and digital spaces. The goal was to encourage a diverse range of students with varying levels of commitment to the program to feel included and to participate. We used the Decidim platform as a digital component in order to upload the 116 proposals that emerged at the end of the first

three days of deliberations and make them accessible to all the participants and partners of the SCA until the closing session. Decidim was used to transparently display the draft recommendations participants had come up with during face-to-face deliberations. Using it potentially allowed participants to contribute belatedly, thoughtfully, but also more discreetly to the deliberative process. It completed on-site moderated debates.

The platform also facilitated online deliberation between participants. The aim of digital deliberation was to open the SCA process to students who did not participate in the three-day launch, and to allow for asynchronous participation. This enabled many students who were unable to participate in the launch for various reasons (such as disease, student jobs, overloaded timetables, or family obligations) to express their opinions, provide feedback on the measures, and suggest possible redirections.

Non-participants aware of the process (the maxi-public) were potentially able to take part in deliberation through Decidim. As well the limited communication related to the SCA (posters and an article in the university newsletter and magazine) however prevented outside participation from materializing at a large scale and the 116 initial proposals were mainly commented, when the case arose, by active participants.

Figure C. *Another proposal on Decidim "favouring face-to-face debate" https://decidim.u-pec.fr/processes/CCE2/f/49/*

As regards this proposal, where students comment on the initial proposal of the digital citizenship group to favor face-to-face debate, three comments were made during an intermediary event and on the following day. The first two comments were made by active participants who attended the event, discussed the proposal in a small group and shared the outcome of their face-to-face deliberation on the proposal on the platform. The final commentary was made the next day by an active participant of the SCA who could not attend that intermediary event.

Partners of the SCA such as the university's vice-dean with the digital portfolio (vice-président numérique) or the Fontainebleau city

government were able to access and contribute to the discussions thanks to the online platform.

Decidim was also used to take stock of all the further work done (completing and merging proposals or making new ones) by sub-groups in between plenary meetings to the whole mini-public. The focus was on maintaining student involvement in the scheme, achieved through regular news updates posted on the platform and shared on the social networks of the SCA and the university. In addition, the platform served as a tool for centralizing all the documents related to the process and the way in which the outside world treated the SCA, in particular, by systematically recording mentions of the SCA in the press and on the internet.

Decidim was therefore used to maintain participation throughout the process, which is a tricky issue. Vincent Jacquet (2017) argues that people do not participate because they do not believe in the instrumental value of the deliberative process; participatory processes are often perceived as being unable to influence public policy. This is also true for young people: students often tend to believe that the participatory process lacks the ability to influence public policy. Bouré (2023) highlights students' "fear or foreboding that, the SCA won't have long-term impact', like the Paris climate citizens' assembly, whose proposals were not taken into account at legislative level which led to some criticism of the process". To address the feeling of futility among young participants and increase their engagement, it is essential to establish participation schemes that emphasize the impact and tangible results of their involvement. By incorporating principles of coherence, transparency, and tracking mechanisms of achievement over time, we can effectively engage students and instill confidence in the participatory process. One key aspect of fostering trust and motivation among young participants is ensuring the coherence and transparency of public action following collective decisions. When young people perceive that their voices are being heard and that their contributions have a real impact, their enthusiasm and engagement are more likely to be sustained. This is where Decidim's monitoring functionality comes into play, providing students with a means to monitor the progress of projects resulting from the proposal module. Decidim having been designed after Madrid's Consul, the "Tracking" feature in Decidim is reminiscent of the "feedback loop" described by Gastil based on the study of this other Spanish deliberative platform (2021). Decidim's "Tracking" feature enables students to stay informed about the advancements and achie-

vements related to proposals, categorized by overall progress, specific categories, and sub-categories. Through detailed information, such as a saved history of changes, completion percentages, and milestones, participants gain a comprehensive understanding of the progress being made. This transparency not only enhances their confidence in the participatory process but also allows them to witness the tangible outcomes of their efforts.

As a result, Decidim serves primarily as a coordination platform and as a showcase for face-to-face deliberation. Participants can access information and data on deliberations, respond to surveys, and consult reports of face-to-face meetings. With Decidim, online deliberation did not exactly take place. There were more offline deliberation opportunities during the whole process, compared to the previous year's student citizens' assembly and online deliberation remained marginal. As shown in the example given above, the platform was used to register offline deliberation outcomes, not to truly pursue deliberation online, which either does not take place (no comment) or is limited to one brief comment. It is interesting to note that in figure C, students concur with our analysis that online deliberation can be used to complement and boost face-to-face deliberation. The platform was instrumental however in presenting, coordinating the proposals, maintaining the connection between participants and the partners of the SCA and organizing the follow-up. It also played a symbolic and potential role in maintaining an open deliberative space.

The section below describes the pol.is experiment and explains how this tool enables a new way of facilitating face-to-face deliberation.

4.2.   Enhancing deliberative practices: a detailed analysis of pol.is implementation and its pedagogical impact

In this section we provide a detailed description of the design of the experiment, an analysis of the implementation of pol.is and its pedagogical dimensions, and focus on the impact of the use of pol.is on deliberation during the SCA. Specifically, we demonstrate how discussions on pol.is facilitate in-person deliberation. This section highlights that mapping of opinions (visible to participants) and the automatic reports serve as mediation tools, supporting reflection and deepening the deliberative process. We use the data and visualizations produced during the second and the third pol.is sessions (The topic of the second

session was "Do we believe in fake news ?", the third session's was "Can online courses replace face-to-face courses?") to describe what the report contains and how it can be articulated with face-to-face deliberation.

What is the design of the pol.is experiment? We used pol.is during the SCA in order to introduce new topics and warm up participants before offline sessions of deliberation. The aim of these sessions was to allow participants to find out other people's positions or intuitions on the subject, and thus to develop a shared understanding of the key issues. Indeed, pol.is sessions were conducted in order to provide an overview of the main viewpoints. Registered participants (n=100) accessed the pol.is interface from Decidim. We conducted a live and hybrid pol.is session with online and offline stages. The session included an introduction and context phase, followed by two rounds of deliberation. During the first round, which lasted 25 minutes, participants submitted individual comments and voted on their computer or phone. We asked participants to submit as many comments and votes as possible. During the second phase, which lasted 8 minutes, participants were only allowed to vote on proposals.[7]

Prior to the session, we added 5 comments for participants to vote on:[8] "Yes, because they are more accessible", "Online courses allow for more flexibility", "No, because they don't allow for students to maintain their contact with teachers", "we are heading to having more and more online courses", "offline courses are necessary".

The tool's parameters were as follows:

Parameters	First round of interaction	Second round of interaction
Participants can see the visualisation	No	Yes
Participants can submit comments	Yes	No

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7 To minimize the disparity in the likelihood of each statement being seen by participants, we have decided to proceed in two phases. In the ideation and voting phase, the first statements submitted are more likely to have been viewed by a larger number of participants. We aimed to stabilize the number of new comments so that each participant can position themselves (i.e., vote) on all statements or the maximum number of statements.

8 Before the live session, the moderator seeds the conversation with five comments from the back office. This ensures that the first users have something to vote on and can use it as a basis to write their proposals.

Show explanation text above voting and visualisation	Yes	Yes
Prompt participants to subscribe to updates. A prompt is shown to users once they finish voting on all available comments. If enabled, participants may optionally provide their email address to receive notifications when there are new comments to vote on.	Yes	Yes
Show Facebook or Twitter login prompt	No	No
No commenys shown without moderator approval	No	No
Participants cannot submit commenys without first connecting either Facebook or Twitter	No	No
Participants cannot vote without first connecting either Facebook or Twitter	No	No

Figure D. *Table showing the parameters of the two phases of pol.is experiments*

During the student citizens' assembly, we carried out the pol.is experiment three times. The three pol.is session focused on the three following subjects:

1. Are digital tools a lever to promote ecological transition?
2. Do we believe in fake news?
3. Can online courses replace face-to-face courses?

There was no continuity between the different sessions: each time the topic and the participants were different. In further research, it would be interesting to conduct pol.is sessions at different times with the same subject and to measure attitude change over time.

Pol.is encourages mutual interaction and a high degree of information sharing between participants. Instead of commenting in threads, participants are asked to read and to react to a maximum of free-standing and very short comments that appear isolated. We suggest that this type of interaction is exactly deliberative if we define deliberation as a process that involves the activity of generating and evaluating arguments in favor of a proposal (Mercier & Landemore, 2012). Deliberation differs from simple discussion in the sense that it involves an exchange of arguments that requires a cognitive activity of reasoning. For example, two people reciting or linking arguments from memory

are not deliberating: "an activity is deliberative to the extent that reasoning is used to gather and evaluate arguments for and against a given proposition" (Mercier & Landemore, 2012). Hence, during collective deliberation, a group generates arguments and then examines these arguments with the goal of making a choice or solving a problem. During the SCA, participants that interacted on pol.is did not exactly share or assess arguments (see annex 1). They made punchy statements without being able to properly substantiate them while others swiftly reacted without explanation and full consideration. Therefore, we argue that their interactions on pol.is cannot be considered as deliberation.

After completing the two phases, the session leader can generate a session report from the pol.is back-office interface. This report, which is automatically created by the software, was analyzed in real time by the human facilitator and then used to lead discussions.

What does the pol.is report contain?

1. The report contains a statistical analysis of participation (the number of people who voted, the number of people grouped together, the number of votes that were cast, the number of votes per voter on average, the number of statements per author on average).

2. Then, an interactive scatter plot presents the comments on a continuous horizontal line. Each proposal is represented by a dot. The ranking of the comments depends on the level of consensus and disagreement. The further to the right of the solid line the dot is, the more divergent the opinions of the participants. The further to the left of the solid line the dot is, the more consensus there is on the proposal.
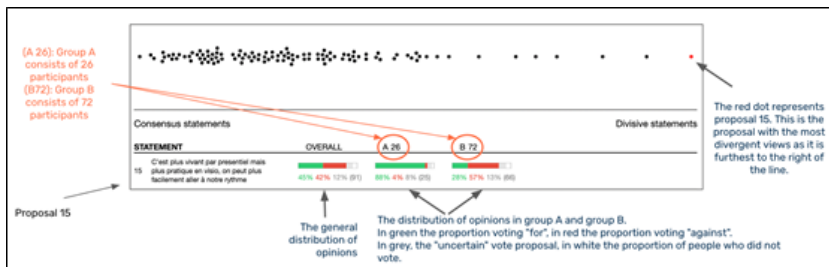
Figure E. *interactive scatter plot of the pol.is session on the subject "can online courses replace face-to-face courses?"*

3. The report also contains the list of the proposals that most people agreed with. This board displays proposals that have received the most agreement overall (regardless of the group to which the participant is attached) and by group.
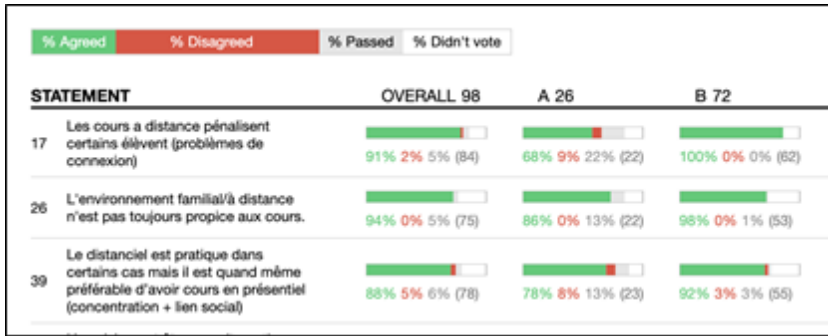
Figure F. *table showing the most consensual proposals of the session "can online courses replace face-to-face courses?"*

4. The report presents the specificities of groups of opinions: it shows proposals that create separate groups. Thus, it shows statements which make groups A and B unique by their votes. The following board presents the five statements that best define group A. For example, participants that form group A voted similarly for the following statement "it is more lively offline but more convenient online, as we can choose our own pace"[9]: the majority of Group A agreed (88%), while the majority of Group B disagreed (57%).

How can the report, produced automatically by pol.is, be used in practice with the students and how can it be articulated with face-to-face deliberation?

After conducting pol.is sessions, the facilitator uses the interactive scatter plot to identify proposals that have the greatest consensus and those on which opinions differ widely. The facilitator then opens a debate and encourages participants to argue in favor of or against the proposals presented. The goal is to understand the exact points of disagreement and agreement. The facilitator faces the challenge of getting

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9   English translation: "It's more lively in person, but more practical online. We can go at our own pace more easily."

participants to conceptualize, define terms, and nuance their arguments on the basis of the participant's verbatims. Thus, pol.is is a relevant tool to use before deliberation to initiate conceptual work.

Here are some examples of consensus and dissensus identified using the pol.is tool during the second pol.is session "do we believe in fake news?", and how they influenced the discussions in face-to-face condition.

STATEMENT	OVERALL 98	A 26	B 72
13 Non, seulement en parti. Il serait mieux de favoriser les cours en hybride	49% 34% 16% (87)	92% 0% 8% (25)	32% 48% 19% (62)
15 C'est plus vivant par presentiel mais plus pratique en visio, on peut plus facilement aller à notre rythme	45% 42% 12% (91)	88% 4% 8% (25)	28% 57% 13% (66)
30 Les cours devraient être réalisés en format hybride pour permettre à chacun d'étudier selon les modalités qui lui conviennent	62% 30% 6% (88)	100% 0% 0% (25)	47% 42% 9% (63)
14 Tout dépend de ce que l'on appelle le contact avec les professeurs, selon moi il est tout à fait possible de garder un lien même a distance.	35% 44% 19% (89)	76% 7% 15% (26)	19% 60% 20% (63)
87 Absolument pas, les cours à distance ne permettent pas suivre de façon concentré le cours.	61% 25% 12% (63)	10% 68% 21% (19)	84% 6% 9% (44)

Statements which make this group unique, by their votes:

Figure G. *table showing the statements which make group A unique by their vote for the pol.is session "can online courses replace face-to-face courses?"*

| Consensus statements					Divisive statements
STATEMENT E 12	OVERALL	A 26	B 17	C 8	D 5
16 you never know who's right and who's not on the internet	41% 32% 25% (58)	50% 10% 40% (20)	46% 15% 38% (13)	100% 0% 0% (8)	0% 100% 0% (5)	0% 83% 16% (12)
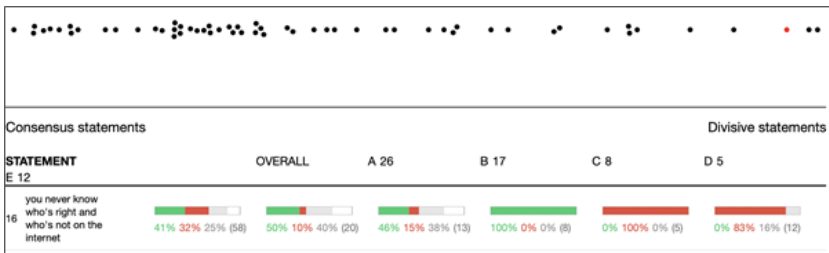
Figure H. *interactive scatter plot of the pol.is session on the subject "do we believe in fake news?" that shows the percentage of students in groups A, B, C and D that agree and disagree with the statement #16 "you never know who's right and who's not on the internet"*

There was no consensus on statement 16 "You never know who's right and who's not on the internet". The visualization below shows

that it is one of the proposals for which groups A, B, C, D and E did not agree. While group B unanimously agreed with this statement, groups C and D disagreed (100% of the members of group C and 83% of group E disagreed with the proposition). We also note that there was no consensus on the statement within groups A and B: only 50% of group A members and 46% of group B members agreed with the statement.

There was no consensus on statement 23: "You can't know who's right, especially nowadays with social media." This statement is very similar to statement 16 presented previously. However, it adds a clarification: social networks are the reason for our difficulty or inability to identify who is right. Generally speaking, the distribution of opinions in each of the groups was equivalent to that in Question 16.

For participants who agreed with statement 16, this means that social networks are a reason that justifies the assertion that we cannot know who is right. The mention of social networks did not convince or change the minds of participants who disagreed with statement 16.
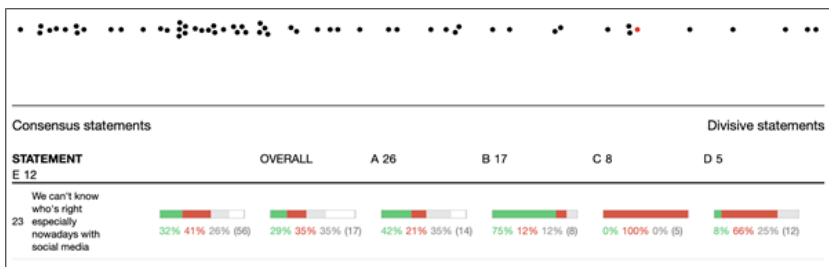
Figure I. *interactive scatter plot of the pol.is session on the subject "do we believe in fake news?" that shows the percentage of students in groups A, B, C and D that agree and disagree the statement #23 "We can't know who's right especially nowadays with social media"*

Members of groups C and D, that did not agree with statements #16 and #23, agreed with the idea that we cannot verify all sources of information and that there is fake news on social media. However, there was no consensus on statement #18, which stated that "we must all choose to believe certain sources of information without verifying them."
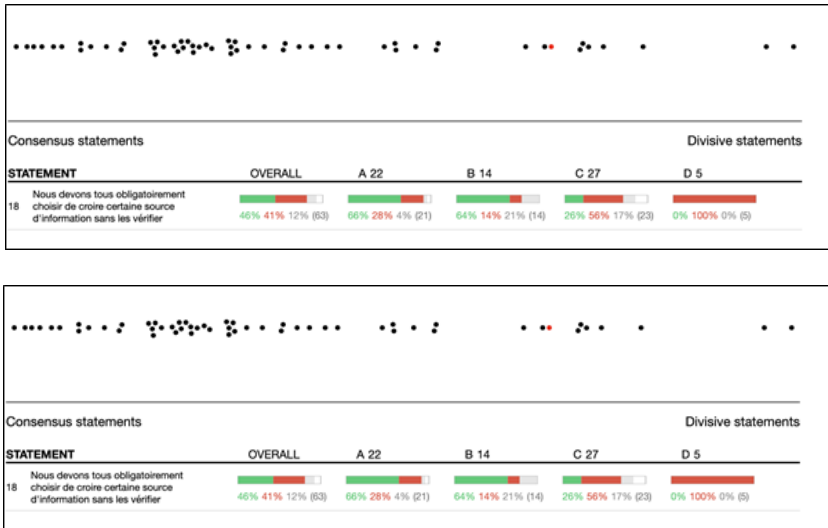
Figure J. *interactive scatter plot of the pol.is session on the subject "do we believe in fake news?" that shows the percentage of students in groups A, B, C and D that agree and disagree the statement #18 "We all necessarily choose to believe some sources of information before fact-checking"*

Among the participants, 46% agreed and 41% disagreed. During the plenary discussion students mentioned that it is not feasible to verify all sources of information we encounter, as this task would be "colossal and futile." During the deliberation phase, Group A, B, C, D reached divergent conclusions based on the same premises. Groups A and B acknowledge that it is difficult to fact-check everything, and that social networks often massively spread fake news. They conclude that people must trust certain information. Group A and B expressed that people are credulous: they do not easily recognize if information is true or false, and tend to believe it. Group C and D also acknowledge that it is difficult to fact-check everything, and that social networks spread fake news massively. However, they conclude that we do not blindly trust information: people easily recognize if information is true or false, they do not believe in it without evidence. The offline session revealed that the notion of gullibility is at the heart of the differences between the groups.

After face-to-face deliberation, we found that the analysis of statement #9 confirms a pattern of voting between groups regarding the conception of gullibility among participants. Members of groups A

and B tend to hold statements that suggest people are credulous, while members of groups C and D disagree with those statements. For instance, the voting results for statement #7 "yes because we do not verify sources" seem to follow this pattern: the majority of Group A (70%) and Group B (53%) agree with the statement, while it is not the case for Group C (47%) and Group D (20%).
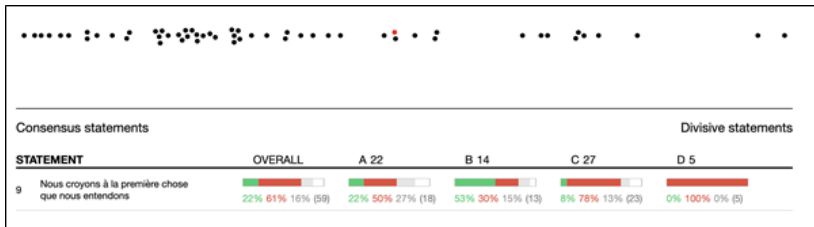
Figure K. *interactive scatter plot of the pol.is session on the subject "Do we believe in fake news?" that shows the percentage of students in groups A, B, C and D that agree and disagree the proposal #9: "We tend to believe the first thing we can hear"*
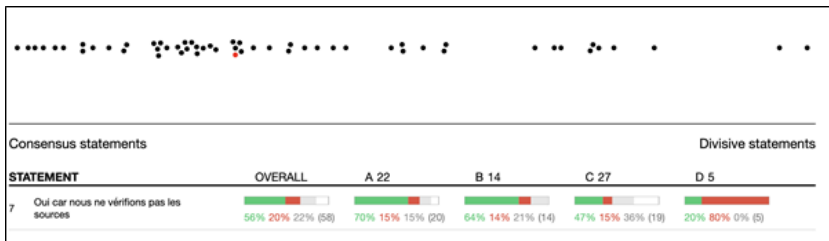
Figure L. *interactive scatter plot of the pol.is session on the subject "Do we believe in fake news?" that shows the percentage of students in groups A, B, C and D that agree and disagree the proposal #7:"Yes because we don't verify sources"*

How do the report and the consensus map support reflection and deepen the deliberative process?

The mapping of opinions (visible to participants) serves as a mediation tool that supports reflection and deepens the deliberative process. The role of pol.is is to provide data that identify consensus

and dissensus between clusters and within[10] clusters. This data is the foundation for the human interpretative analysis of the discussion and moderation of the face-to-face deliberation that occurs after the pol. is session. During face-to-face deliberation, we observed additional advantages of using this tool. Participants were able to understand the positions of others, as it helped them take different perspectives into account and adopt alternative viewpoints. This led to greater willingness to consider all the statements, knowledge, and beliefs held by group members. Specifically, the use of pol.is helped participants better understand those who held different or opposing viewpoints. By grouping individuals into clusters based on their opinions on a set of propositions, participants could visualize all the propositions supported by others, and see how those propositions justified their beliefs. The automatically-generated report and the human facilitator complement each other. The role of the human facilitator is to identify if there are ideas, beliefs or knowledge within the statements that justify other statements. By interpreting the set of statements and statistics, the human facilitator can connect opinions with the knowledge or belief that underlie them and initiate a debate about it. For instance, the concept of gullibility was established through face-to-face deliberation facilitated by a moderator who asked questions based on statistical data from pol.is (statements #16, #18 and #23) and provided her interpretation of statements.

5.   Conclusion

In this analysis of the use of Decidim and pol.is in a face-to-face deliberative mini-public such as the student citizens' assembly of Université Paris Est Créteil, we show that when face-to-face deliberation takes place, dedicated online deliberation software use is neither dispensable nor successful in ensuring that online deliberation takes place. Our study details how these tools, based on their affordances and exploitation of their functionalities through the design of the deliberative process, boosted face-to-face deliberation as they enhanced the pedagogy, inclusiveness, thoroughness, transparency, continuity, legitimacy and accountability of the process.

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10 Identifying disagreements between members of a group (i.e., within groups) shows that those who have the same opinion on the main topic may hold it for different reasons.

Deliberation does not take place on pol.is. If participants do not deliberate on pol.is then how can we assert that it enhances deliberation? We used pol.is to create better conditions for later deliberation. The use of pol.is was instrumental in designing an information-sharing session for gathering opinions and analyzing their tendencies. The deliberation actually took place face to face, based on the results presented on the pol.is interface. The data provided by pol.is serves as the basis for the human interpretative analysis of the discussion and moderation during the face-to-face deliberation that follows. Pol.is provides insights for new ways of facilitating deliberation by using proposals with majority agreement and proposals with the most divisive opinions to supply the debate in face-to-face conditions. Pol.is provides data on consensus and divisive opinions within and between clusters, forming the basis for interpretative analysis and face-to-face deliberation facilitated by human moderators. Facilitators can identify underlying ideas, beliefs, and knowledge, fostering meaningful debate and sharing understanding. They can also identify consensus and identify limits and difficulties behind consensual proposals. Pol.is enables participants to understand diverse perspectives and promotes hybrid participation. Pol. is imparts valuable pedagogical virtues, fostering inclusivity, hybrid learning experiences, and providing education on the principles of deliberation, including the understanding and respectful exchange of divergent points of view, encompassing both consensus and dissensus dynamics. Its features provide participants with a holistic understanding of the deliberative process. In essence, pol.is doesn't just facilitate deliberation; it educates and instills the practice of deliberative democracy.

Similarly, we cannot posit that deliberation takes place on Decidim.

The findings of this detailed analysis of the use of Decidim and pol.is in a face-to-face deliberative mini-public is that online deliberation software don't have to fully replace invaluable face-to-face deliberation. They can nonetheless enhance it in many ways, depending on their affordances and the design of the deliberative process. During the experiment we conducted and observed, the two sophisticated online deliberation tools were less instrumental for direct deliberation than:

♦ Pedagogy: preparing for deliberation through teaching deliberation, displaying the variety of viewpoints and arguments, detailing the process

- Inclusiveness: allowing for asynchronous occasions to participate in deliberation and catch up if participants who are absent, less vocal or needing further reflection to finally take part
- Thoroughness and access: allowing for interaction with partners, decision-makers, experts who can identify relevant proposals and contribute to their deepening and further relevance through meaningful exchange
- providing transparency and continuity to participants: they have access to the outcome of all groups' deliberation and have the opportunity to join in
- legitimacy: potentially connecting the mini public with the maxi public
- accountability: allowing for the follow up by participants of their work and the monitoring of the implementation of their policy proposals

Further research is needed on "hybrid" deliberation, with closer attention paid to the specific blend of face-to-face and online deliberation. Comparisons could be drawn with the Conference on the Future of Europe, which involves offline national deliberation and synchronous/asynchronous online deliberation using visioconference tools and Decidim. Another comparison could be made with the Paris climate citizens' assembly, which used Decidim to reach out to a wider audience.

To measure attitude[11] changes within and between groups after deliberation, a second political interaction could be included following face-to-face deliberation. This would be interesting not only as part of the study of attitude change and reasoning but also to guide the work and decision-making of the Citizens' Assembly.

The pol.is administrator can choose whether or not to grant access to the opinion map. Investigating whether the visualization of opinions affects user behavior (in terms of content generation and voting) would be of interest. This would benefit the social influence and collective decision-making literature.

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11 An attitude is a psychological tendency, or disposition, to evaluate a particular object or class of objects favourably or unfavourably, negatively or positively (Eagly & Chaiken, 2007).

Acknowledgments
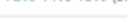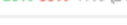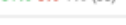
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Annex

Table *presenting 12 statements produced by participants in the pol.is survey "can remote classes replace in-person classes?"*

	STATEMENT	OVERALL 98	A 26	B 72
0	Oui car ils sont plus accessibles	24% 50% 24% (73)	45% 10% 45% (20)	16% 66% 16% (53)
1	Les cours à distance permettent une plus grande flexibilité	57% 32% 9% (83)	87% 4% 8% (24)	45% 44% 10% (59)
2	Non car ils ne permettent pas aux étudiants de maintenir un contact avec les professeurs	75% 11% 12% (87)	30% 39% 30% (23)	92% 1% 6% (64)
3	Nous nous dirigeons vers de plus en plus de cours virtuels	42% 24% 32% (77)	50% 25% 25% (20)	40% 24% 35% (57)
4	Les cours en présentiel sont nécessaires	84% 5% 9% (85)	65% 13% 21% (23)	91% 3% 4% (62)
5	Les cours en présentiel sont inadaptés aux personnes avec handicap (sourds par exemple)	66% 21% 12% (75)	61% 27% 11% (18)	68% 19% 12% (57)
6	Les cours en distanciel sont inadaptés aux personnes sourdes	72% 11% 16% (80)	54% 18% 27% (22)	79% 8% 12% (58)
7	Les cours en présentiel facilitent le maintien de l'attention des étudiants	78% 11% 9% (84)	43% 34% 21% (23)	91% 3% 4% (61)
8	Non. Les cours en distanciel ne doivent servir qu'à remplacer ceux en présentiels si ceux-ci ne peuvent être assurés.	70% 15% 13% (88)	33% 41% 25% (24)	84% 6% 9% (64)
9	Les cours en distanciel invitent aux distractions et céder à l'ennui (téléphone...)	72% 14% 13% (83)	25% 33% 41% (24)	91% 6% 1% (59)
10	Les cours en distanciel sont fatiguant pour les étudiants et sont sources d'inégalités en fonction du matériel numérique.	82% 13% 4% (90)	56% 36% 8% (25)	92% 4% 3% (65)
11	Les cours en distanciel sacrifient le lien étudiant/professeur	73% 10% 16% (80)	28% 33% 38% (21)	89% 1% 8% (59)
12	Le distanciel n'est pas plus accessible: nécessite du matériel et de la connexion stable et forte.	83% 11% 5% (79)	59% 27% 13% (22)	92% 5% 1% (57)