DigiEduHack Solution
Trento - Innovative learning beyond covid: collaborative tools in scientific labs and teams experiences.
Challenge: Trento - Innovative learning beyond covid: collaborative tools in scientific labs and teams experiences. Challenge 2020

Collape

Share ideas and collaborate efficiently with your new team.

The aim of our project is creating a tool for teachers and students, which facilitates group-making and collaboration between people with different backgrounds. It also provides a selection of links to useful tools with the relative tutorials.

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Members roles and background

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Solution Details

Solution description

Our final product is a collaborative tool developed in order to foster an easier and more controlled process of team-creation and project collaboration both for students and teachers. The tool is meant to allow efficient group-making based on background, interests and skills and, thanks to links with already existing collaborative tools, to facilitate a more engaging and active learning process.

On one side, there is a public level designed for side projects that allows everyone, student or teacher to look for teammates or projects to join, navigating through already existing projects and joining groups or, otherwise, pitching a project and searching for members. The status of the project is also showcased, allowing for control and better communication.

On the other hand, there is the private section which is meant to be linked to the main digital environment used by the client (e.g. Moodle, at the University of Trento). From the teacher perspective, the tool facilitates group-making within different projects and courses and tracking and controlling activities. Teachers can also easily program Zoom calls from the platform and supervise the work done by the teams. From the student perspective, the platform allows you to form teams that are balanced in terms of backgrounds, skills and interests and have a unique studying and working environment.

The tool will employ AI, words embedding and interaction metrics to measure affinity between projects and individuals, with dimensionality reduction to portray relationships on a 2D canvas. As a first-order approximation, the tool will use the content provided in the users' general short bios and project-specific keywords to figure out a vector representation of their interests which will be compared against other members of the same board. Differences will then be rendered in a graphical form unto the canvas in a 2D space. This is only a preliminary sketch of a solution which will have to be tested as described in the development schedule below.

As for advantages, the universities could benefit from having a platform which comprises a plethora of collaborative tools in a unique environment and a safe space for collaboration, simplifying the transition towards online and collaborative learning and fostering connections and collaborations

between departments and other universities. Moreover, it is designed as a flexible tool so it could be also adopted by other institutions such as high schools or even companies!

Solution context

"Collape" tries to answer to several problems that we as students and professors have encountered, especially during this COVID-19 pandemic. They can be grouped in two main areas, the team-forming and working in online learning environments and the collaboration on side-projects.

As regarding the team related problems, from the point of view of the teacher, the main difficulties were related to the managing of the team-generation process because it is impossible to create groups that are balanced in terms of the background without having that information and without asking the students to form groups by themselves. It is a process that takes a lot of time both for the students and for the teachers and usually, it ends up being not well balanced and, as a consequence, it does not deliver a smooth interaction and work within the group. Moreover, teachers faced huge challenges in adopting new ways of teaching and interacting with their students and they experienced a lack of control over their teaching methods and students activities, not only because of the disruptive change but also because of the lack of structure and scatteredness of the available collaborative tools.

On the other side, the growing amount of online lessons and the switching from the standard frontal lesson towards a more interactive way of teaching increased the need of having lessons and team activities organised in a single environment and having a useful tool to help them be organised in groups according to their backgrounds and interests (information gathered using a form in the sign-up phase) and, moreover, to help them connect with people from different departments and universities.

In the meanwhile, a problem that was already present before COVID-19 became bigger. Finding interesting projects to work on, getting in touch with students with similar interests but different backgrounds and finding mates in order to finally develop a great idea you are keeping on the shelf was still a problem without a solution... until now!

Solution target group

The main target users of our project are university students and teachers. The university context is where usually the collaborative works and group projects take place. Since it provides an intuitive collection of tools and a clear interface for joining workgroups, it represents a useful tool for the learning experience. It also allows us to easily interact with other people and work on new projects, also among different fields. It is a great opportunity for teachers to easily have access to different learning tools (all grouped together on the same page) and supervise the progression of the projects among the different teams and set up workshops or other interactive sessions.

Our solution can easily be extended also to high school students and teachers in which collaboration

and participation are usually promoted.

Our target could also comprehend researchers and free-lance experts as users, who are usually looking for collaborations, suggestions and validation of their projects.

The main clients would be the universities, and since the main aim of this project is to make it easier to collaborate during the lectures and other group activities, it could be extended to high schools and even businesses.

Solution impact

Our solution, as a comprehensive tool for online team-forming and team-working, is meant to have an impact on several levels, such as academia, individual students and teachers. Moreover, its public area designed for fostering collaboration between not only different departments but also between people from different universities and experts in different fields could have a positive impact on knowledge transferability between academia and local territories.

Its impact will be measured using three different sources, in several moments and considering the 4 levels aforementioned.

- Statistics taken from user interaction and the general analytics of the platform will deliver information about the adoption of the technology from the teacher and student perspective, considering:
    - number of sessions and conversion rate regarding used pages and patterns of interactions in the website;
    - actions taken within some specific areas of the website (such as the creation of a new team or creation of a new project);
    - percentage within each department of the number of teachers and students that are using the platform;
- Short and mandatory pre and post questionnaire for students and teachers (once per project), getting information about:
    - the satisfaction rate of the platform use;
    - if it has improved the team-forming and working experience;
    - rate satisfaction of each project they were working on (2 short pop-up questions after having finished a project);
- Focus group after the implementation and a period of testing with teachers and students, in order to:
    - validate the solutions that were designed according to the first part of the user research;
    - get information about the capacity of the tool to solve the main issues and answer the needs that have emerged in the research part;
    - collect suggestions for possible further improvements and development.

Some of these measures will also be used internally to improve the group facilitation algorithms and optimise the platform.

Solution tweet text

Let's meet your next project! Collaborate, create, share ideas with your team and explore unknown fields with "Collape"!

Solution innovativeness

The main innovation point of our project is tackling the issue of team-making in a digital environment. There are plenty of excellent tools in the market for communication, teamwork, project management and brainstorming such as Slack, Zoom, Gsuite, Trello, Asana, Miro, Mural etc. Though the issue of matching up people into groups is largely left up to the users to do in advance. This is generally a non-issue between people who know each other reasonably well, but it becomes way harder when it's done among strangers and thus it cannot be left to mere chance. The COVID-19 emergency, in particular, made this kind of task particularly cumbersome, while before people teaming up could meet in a classroom on a regular basis, get to know each other and team up in a spontaneous way; now this process happens by long rounds of emails, spreadsheets and cluttered virtual sticky boards, with the added difficulty of getting in touch with people we largely don't know.

Institutional customers

Instructors can benefit from this tool whenever they are planning to carry out teamwork as part of a course. Our platform helps people aggregate in groups based on general and project interests using AI applications to abstract interest similarity out of short bios the users are asked to fill in and tags they can supply directly. This match facilitation process avoids the coercive approach of top-down grouping, the painstaking process of sorting students in meaningful and diverse groups, while also allowing for better control on the progress of the team projects inducing members to log in their activities.

Standalone customers

Non-institutional users can have two types of interaction with this platform: as guests of team work hosted by the institution they are affiliated to, or as standalone users looking for people to cooperate with around the world on some project. They will benefit from avoiding spending plenty of time inefficiently in the group making process, this will foster interaction between the users and reduce the organisational cost of group activities in every context.

Solution transferability

Our solution is easily adaptable to users from different languages and cultures. It is a deep-felt concern in the team to keep the platform's minimum requirements with regard to connection speed and processing power reasonably low in order to allow for the widest usage possible even in context with insufficient infrastructures.

In business

The main objective of our solution is to support team activities in an educational setting by helping students to self-aggregate in groups while easing the organisational burden on the faculty. Thanks to its versatility, our tool can be easily used out of the box or with small extensions in corporate settings, by hobbyists or work as a startup hatcher.

The private half of the project can be easily used by private businesses to open internal research projects or by the R&D division. The public side of the project can be used to launch spin-off projects or encouraging joint ventures in fringe business areas.

Another interesting area to develop would be adapting our platform to the needs of on-job instructors who teach intensive courses generally to an audience of people who do usually work together. The technology we are planning to develop could lead them to have deeper and easier interaction between their trainees, without the need for longer sessions which are not generally possible in these settings.

Other applications in education and research

A different application within the academic environment is employing the public branch of the project to nurture international cooperation in research by bringing together specialists around on investigation topics or working papers. In other educational contexts, our technology can be employed in high schools either to manage group works or to create teams in projects involving more than one school or class.

Project transfer

Further, on the topic transferability, we have introduced the possibility to share and extend publicly the projects incubated in the context of the private area in order to integrate the course's activities with eventually interested parties outside the academic world to bolster synergies and technology transfer.

Solution sustainability

The implementation of the solution will follow roughly the schedule analytically described below. It articulates in several phases how the development should work and what are the outputs and decision from each phase. As with regard, to financial sustainability, the initial development of the product should have quite contained costs which will be scaled throughout the later phases of development according to traction in the market and adoption by users.

Preliminary: November - December 2020

1. **User research**: Exploration of needs, ergonomics, usability and design solutions involving prospective users.
2. **AI development survey**: Survey of the feasibility study, research and sketch implementation of the AI technologies needed.
3. **Technological toolkit selection:** Selecting the technologies and sketching coarse technical implementation guideline

Phase output: technical greenlight or aborting

Development: late December 2020 - April 2021

1. **AI and backend development:** Development of the website, the AIs and groundwork on the third party integration
2. **Design improvement and frontend development**: Improving interaction mechanics, defining the graphics and styling. Frontend development
3. **Scouting for pilot and pre-pilot testers.**

Phase output: working frontend and backend; pre-pilot users secured

Product Integration and optimisation: April - May 2021

1. **Product consolidation**: Integration into a single product and testing within the development core
2. **Pilot study organisation**: Preparation of the first pre-pilot testing and coordinating the stakeholders
3. **Pilot subject definition**

Phase output: working website; pilot institution secured

Pre pilot testing: May - June 2021

1. **Pre pilot testing**: Minimum viable product is going to be tested in a small scale context like a classroom or a university course
2. **Pilot study organisation**: Preparation of the pilot testing and coordinating the stakeholders
3. **Corrections and improvements based on pre-pilot testing**
4. **Open beta deployment of the public side**: The public side of the project is going to be deployed and made available in open beta

Phase output: improved website; public side deployed in open beta

Release candidate delivery and pilot testing: September 2021

1. **Pilot testing**: Medium large scale testing in the pilot institution (e.g. university, or university department)
2. **Corrections and improvements based on pilot and open beta**
3. **Widening of third party services, support and integration:** This is likely the most expensive, unpredictable and time-consuming part in the development of the platform, therefore will be carried out in a prolonged time and prioritising third-party services to integrate according to their usage.
4. **Marketing strategy design**: developing a strategy to promote and increase the market share of the public side of the project, get in contact with educational institutions for adoption of the platform.

Phase output: stable release product; marketing strategy

Market distribution and scale-up: from January 2022

1. **Targeting institution for adoption**
2. **Fostering the community**: engaging the community as a tool of usage propagation and monitoring the need of the user base in order to gain long term growth.
3. **Integration and wider third party support**: improving and widening integration with third-party apps.

Phase output: product finetuning; increase in market share

Pricing strategies are sketched out in the transferability section

We have devised a strategy to diversify the platform's revenues streams to allow to be less financially impactful on any of the singular user categories. Also, diversification helps us in the long-term sustainability of the solution allowing for "steering" of the product on which of the various modalities of use are more appreciated by institutions and the marketplace.

- **Institutional users**
  - Subscription by headcount (institution-wide or active users)
  - Setup and licensing with self-hosting and support consultancy
  - On-demand customisation to be negotiated case by case
- **Standalone users**
  - Free access to the public platform (revenues are integrated through advertising in this section)
  - Premium visibility to projects based on a fee

After CoViD-19

Even though the problem might have become more prevalent during the current pandemic, our solution will not be superfluous once we go back to a 'normal life'. As mentioned above, there are multiple fields to which the solution can be transferred which makes it more versatile than just forming groups for university courses. Moreover, if there is one thing this pandemic has taught us, it's that in many situations we are far more connected than we may think. Ideas will keep arising and new team members are desired in different fields, for which our solution can offer the ideal tool to not leave these ideas on a shelf but approach them with like-minded others.

Solution team work

We formed a team in which we knew some people using Mural, but none of us knew everyone beforehand. Once the team was formed, we soon created a Telegram chat to start sharing ideas. As a team, we started brainstorming about what our needs are and which things are lacking in our experience, both as students and as online users. We noticed that there exist a lot of useful tools for online learning, most of them unknown, though, in the end, they perform competently according to their own purpose.
We started chatting about our experiences and then we landed on the huge amount of group work we have been facing during these past months.

We realized that the most critical and largely disregard moment for online students is finding some

group mates with whom to collaborate and develop ideas, especially if you cannot go over to other students who would usually sit with you in the classroom. Since most of the projects require people with different skills, we decided to facilitate this with an interface that allows you to promote your ability and find groups that are looking for you.

We thought about how it should appear, trying to clearly distinguish the "public" section and the "private" one.

Some of us worked on the graphics (creating the mock-ups) and others debated about the target users and the way to involve as many people as possible. For future development, we might need some extra team members from a different background (especially computer scientists).

We finally chose the logo and the name (which came thanks to brilliant insight due to a misunderstanding). So, overall, we experienced a very nice working atmosphere, being able to work on our own (or in smaller groups) but also come back together in a timely manner to make sure we stayed on the same page regarding our progress.