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Digital technologies for open and collaborative teaching. A brief framework

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ABSTRACT. The present paper aimed to open a debate about the increasing needs of collaborative learning in digital learning contexts. Collaborative teaching and learning are effective approaches to enhance learning and facilitate students' satisfaction. Digital platforms may help teachers develop collaborative learning environments and provide ways of building various teaching scenarios, promoting autonomous and structured learning contexts.

Key words: collaborative teaching and learning, digital learning, digital platforms, lesson design

ZUSAMMENNFASSUNG. Dieser Beitrag soll eine Debatte über den wachsenden Bedarf an kollaborativem Lernen in digitalen Lernkontexten eröffnen. Kollaboratives Lehren und Lernen ist ein effektiver Ansatz, um das Lernen zu verbessern und die Zufriedenheit der Studierenden zu fördern. Digitale Plattformen können Lehrkräften dabei helfen, kollaborative Lernumgebungen zu entwickeln und bieten Möglichkeiten, verschiedene Unterrichtsszenarien aufzubauen, die autonome und strukturierte Lernkontexte fördern.

Schlüsselwörter: kollaboratives Lehren und Lernen, digitales Lernen, digitale Plattformen, Unterrichtsgestaltung

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Introduction

By introducing the term *digital pedagogy,* Kearney & Nielsen (2020, p. 213) describes the art of teaching and learning with contemporary educational technologies. He also argued that teachers need a theory of learning to drive their digital pedagogical decision-making and planning. Furthermore, having high-quality digital resources and hardware willingly available, teachers are expected to move beyond traditional approaches to more fully realize the potential of using learning technologies to support teaching and learning in more progressive ways.

Since the 1990s, more open-ended software has been developed to support students' creativity and critical thinking. For instance, critical thinking applications include concept maps for collaborative learning, spread-sheets for problem-solving and modelling, and simulations for hypothesis testing (Kearney & Nielsen, 2020). All these applications persisted overtime as very well-known pioneers or foundations of contemporary student-centred digital pedagogies.

Looking at the construct of collaborative learning, it reveals a set of factors and facets grounded on step-by-step processes. Small or large groups share learning outcomes, efforts, responsibility, and authority. According to Mehta (2019), we can infer, by an analogy, that textbooks form the infrastructure of knowledge within a classroom and the collaborative learning forms the infrastructure of learning. When explaining how to approach the collaborative learning over the time, different authors (Arends, 1994, Quinn et al., 2014, Kimmelmann & Lang, 2019, Mehta, 2019, Maier & Simkins, 2023) are providing a convergent guidance towards a set of values and indicators of the cooperative learning design:

- develop a sense of community among members who are learning together within the cooperative groups;
- set realistic goals and expectations regarding the learning activities and outputs when planning cooperative teaching situations;
- work through conflicts, the positive interdependence leads to achieving goals;
- shift from teachers to learners: collaborative teaching and learning requires equal collaboration from teachers and students;
- continuously assess the results: even though it takes time for a group to form itself, an than to collaborate and learn, it is important to assess results at every stage.

The end results are not the only results that matter, but how effective communication is, how easily conflicts are resolved it is equaly important. Continuous assessment leads to the identification of things that need to be worked on (Mehta, 2019).

1. Collaborative teaching and learning. The concepts and present-day paradigms vs. digital tools

Digital technology and contemporary learning applications can be used to guide pairs or small groups of learners through active-teaching and active-learning settings and facilitate more autonomous, collaborative learning.

Regarding the use of cooperative teaching and learning approaches, Maier & Simkins (2023, p. 71) summarized the most important literature recommendations, based on research findings: group size of 2-4 students with heterogeneous skill levels and backgrounds, organized by the teacher. In addition, group work needs to be well structured so that students can function on learning rather than second-guessing what they should be doing. Ideally, this structure requires each student to have a clearly-defined and purposeful *role* in group work (note-taker, time-keeper, summarizer, etc.) and should include a mechanism for enforcing the individual accountability to reduce problems with "free-riding".

In different terms, emphasizing the more motivating and developmental factors involved in, Mehta (2019) summarises the core elements of collaborative teaching and learning:

- the *common goal* ensures all the efforts are put towards it;
- *decision making* towards the common goal: once teachers and students understand it is the impact and overall good that matters, decisions become easier;
- as a group, encouragement from each helps the *holistic development*, strengths are encouraged and weaknesses are improved on;
- *supportive learning environment*: there are not just ideas that get exchanged, personalities are shown, and their ability to work as a team is challenged;
- *social skills* facilitate the entire process of collaborative learning: they are required to help the students bridge the information gap, from finding information to garnering a knowledge construct.

Digital platforms may help teachers develop collaborative learning environments and provide ways of building various teaching scenarios, promoting autonomous and structured learning contexts.

However, the top three tools (YouTube, PowerPoint, and Google Search) are not intended for – or designed for – education (Stripe & Simpson-Bergel, 2023). From a learning design perspective, selecting the tool should be one of the last steps – not the key focus. Prefacing his book, Matt Jarvis (2023, viii) emphasise upon the judicious approach: "Being pedagogy-led and tech-enabled". Teachers should be thinking about choosing a platform or platforms

only in the light of what they want to achieve. In other words, they should set the goals according to principles of good pedagogy and use the technology to enable the students to achieve these goals. According to Jarvis (2023), planning teaching activity starts "from the point of what the teacher and the class would like to be able to do, not what a particular application can easily do or what it looks like it should be used for"(viii).

2. Facilitating collaboration in teaching-learning through the use of online platforms

2.1. Miro

Miro (www.miro.com) is an improved online whiteboard platform that offers many facilities to encourage collaborative learning. It is a suitable tool for creating both synchronous or asynchronous teaching activities adapted to the needs of generation Z and digital natives.

Miro can be accessed from any web-enabled device, such as computer, tablet, or phone, directly from an internet browser or downloaded using App Store/Google Play. The platform requires an initial registration using either Google Mail or another e-mail. (Figure 1).

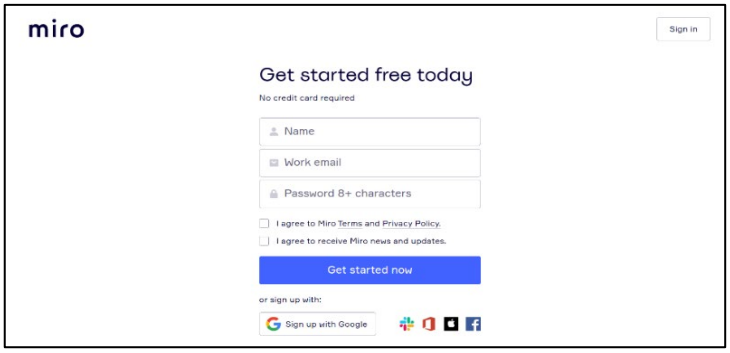

Figure 1. Creating an account on Miro platform

After registration, the user has to set up a team. The free version of Miro allows users to create one team and three different boards within it. The first board is automatically generated and can be modified. By clicking on "new board", another blank board can be created, or a board with a template by choosing from the template library (Figure 2).

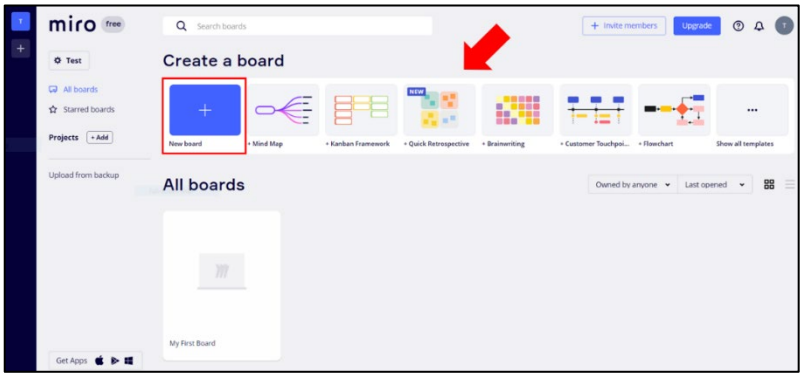

Figure 2. Creating a board in Miro platform

The templates from the library support presentation of notions, by the instrumentality of diagrams, and collection of ideas and feedback. They also facilitate figurative representation and display in virtual classes and the creation of agile workflows for students (Figure 3).

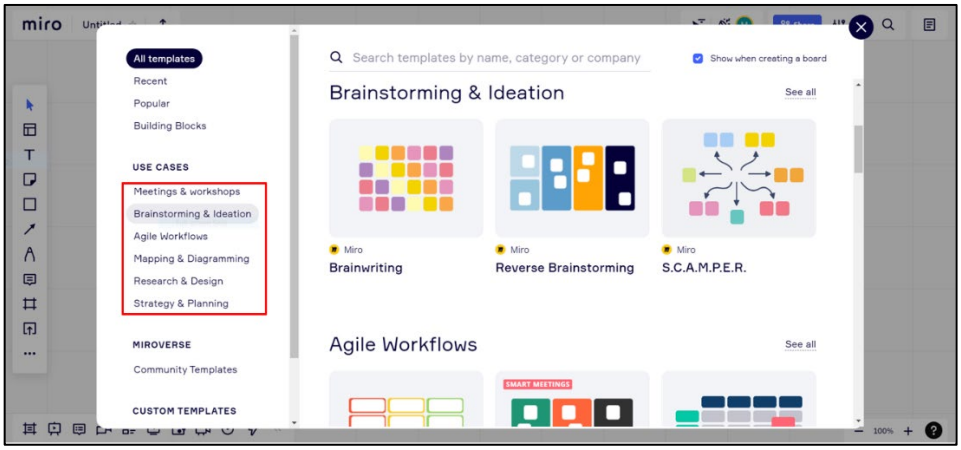

Figure 3. Choosing a template from template library in Miro platform

The board interface offers a variety of options that support the transmission of information and the creation of interactive lessons and exercises: adding text boxes or sticky notes and uploading different files. Also, Miro allows users to add comments with suggestions of improvements, or that facilitate the distribution of autonomous tasks to the pupils or students (Figure 4, no. 1). Other functions of the platform include attaching different charts, tables, mind maps, icons, and stickers/emojis, which enhance students' or pupils' involvement in activities (Figure 4, no. 2).

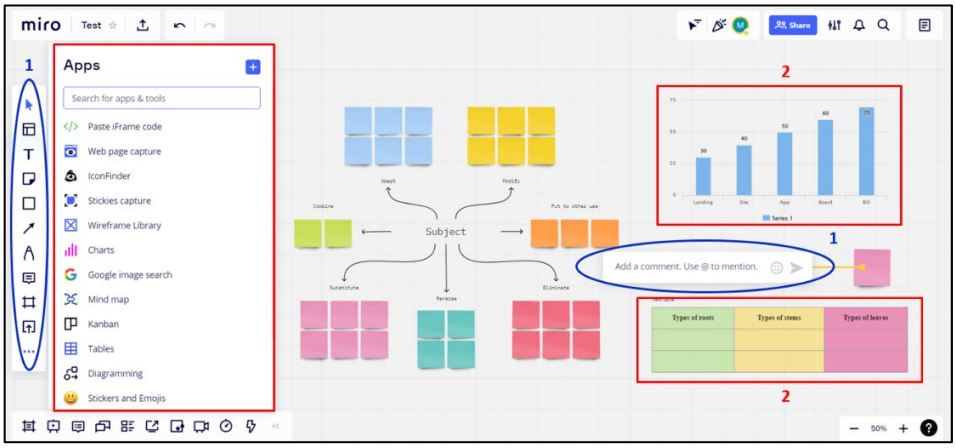

Figure 4. Introduction of diagrams, charts, comments, tables and other options in Miro board

Miro supports collaborative learning and effective teamwork through the medium of its share option. The online whiteboard can be shared using the "share" button. Students or pupils can be invited to participate in real-time lessons, edit exercises and work together to achieve better results, using either their e-mail or a link invitation (Figure 5).

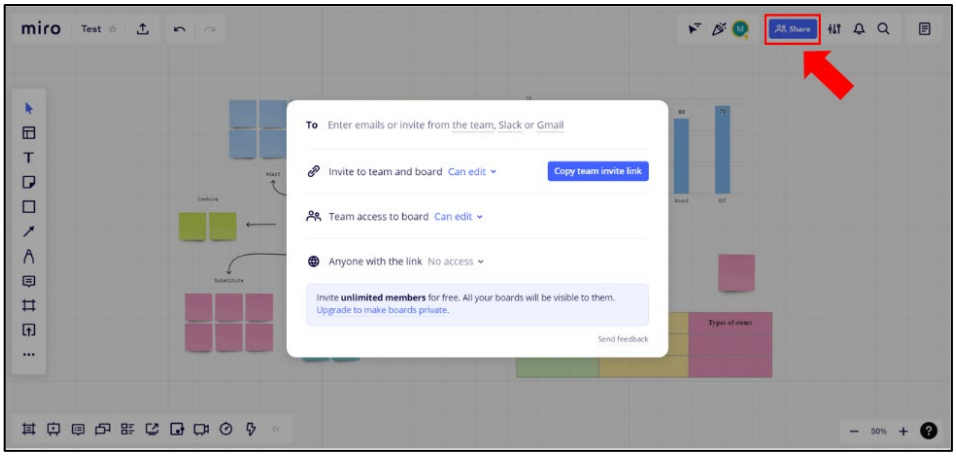

Figure 5. Sharing a board in Miro platform

Moreover, the online whiteboard allows teachers to monitor the activity of the students or pupils and intervene to provide additional explanations and guidance, if necessary (Figure 6).

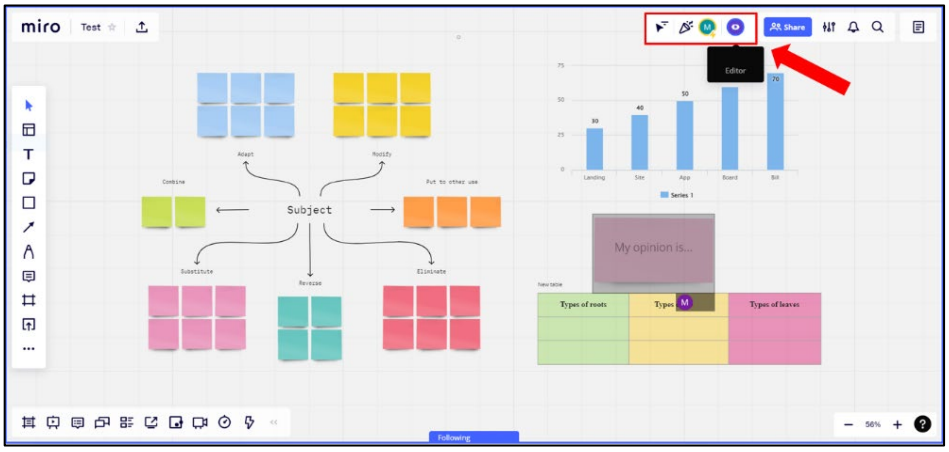

Figure 6. Monitoring students' or pupils' activity in Miro platform

To summarize, Miro is an example of an accessible digital platform that sustains open, collaborative teaching-learning. Its options allow the creation of interactive lessons and virtual "classrooms" in which valuable resources can be distributed and organized to facilitate collaboration among students or pupils.

2.2. Visme

Visme (www.visme.com) is another digital instrument that empowers open, collaborative teaching-learning. It is a visual content creation and collaboration platform that enables users to design different projects.

Visme can be online accessed from any internet browser and any web-enabled device (computer, tablet, or smartphone) or downloaded on a personal computer. The platform requires an initial registration using either Google Mail or another e-mail (Figure 7).

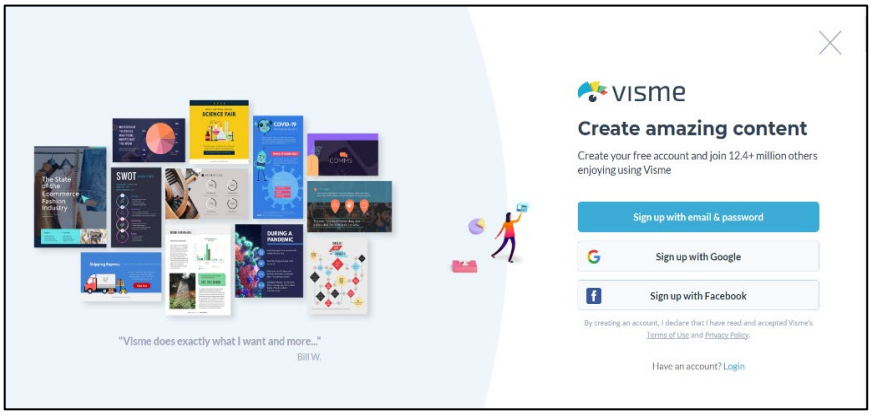

Figure 7. Creating an account on Visme

The free version of Visme allows users to create multiple Workspaces, in which a limited number of participants (maximum 10) can design/organize and share projects available to the team members within that Workspace. Members also need to create an account on Visme and can be added by clicking on the button "add members" via e-mail or invitation (Figure 8).

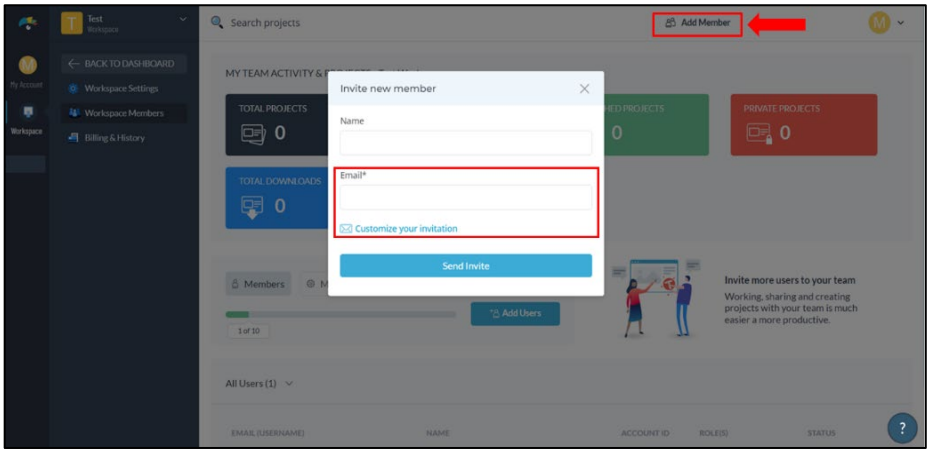

Figure 8. Adding members in a team within a Workspace on Visme

Team members within a Workspace can collaborate to develop a variety of products: presentations, documents, graphics, also videos. By clicking on "create new" from section projects, a blank project can be created, or a suitable template for the project from the library can be chosen (Figure 9, Figure 10). In the free version, a PowerPoint presentation with a maximum of 10 slides can also be uploaded and modified on the platform (Figure 9).

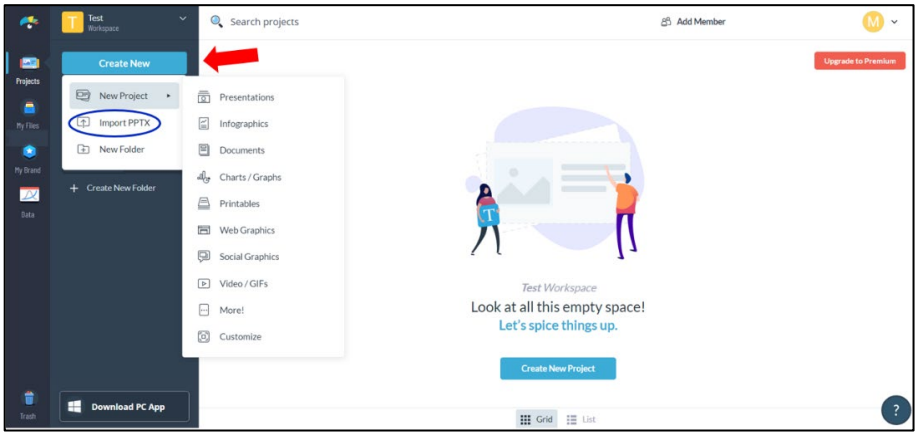

Figure 9. Creating a new project in Visme

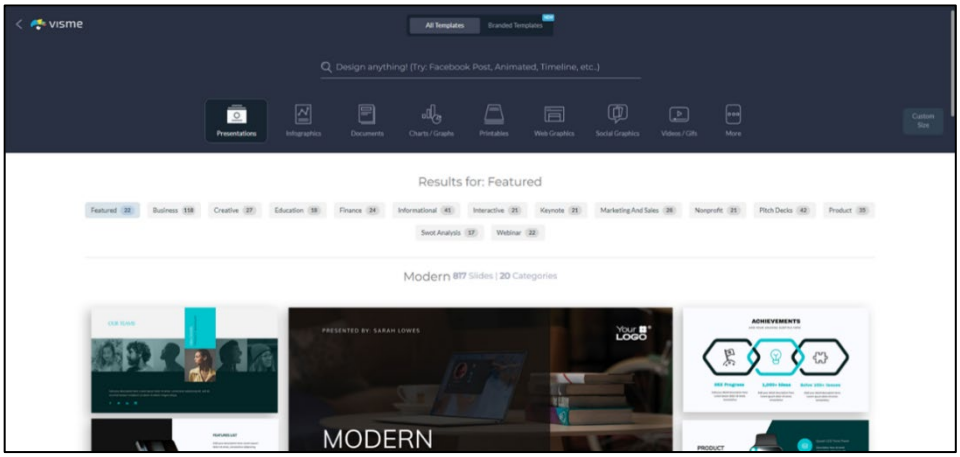

Figure 10. Choosing a template for the project from the library in Visme

The features of Visme enhance the creation of interactive lessons or other figurative representations. For example, team members can choose to add to their presentation different fonts, stats&figures or diagrams, a variety of graphics (3D/animated), photos, data (tables, maps), media (videos), and even select the theme colors, or upload files (Figure 11).

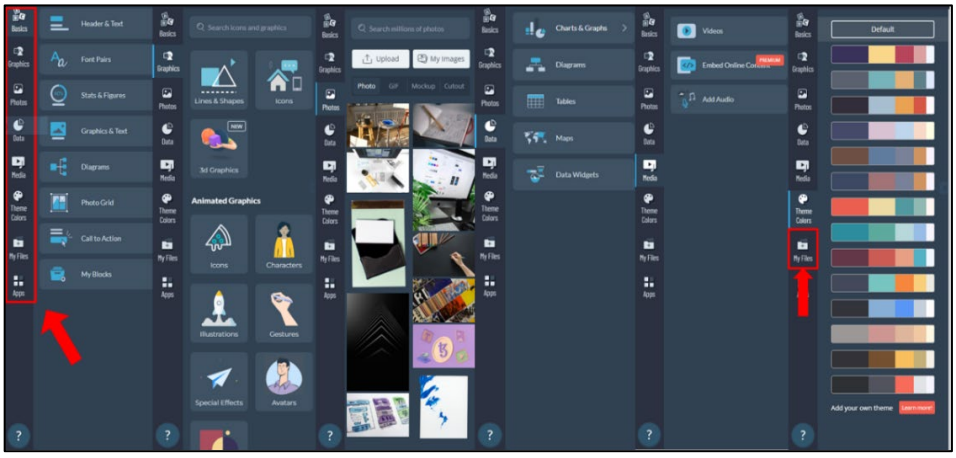

Figure 11. Designing a presentation in Visme

In addition, users can add animations, actions, or effects to design a more interactive presentation (Figure 12).

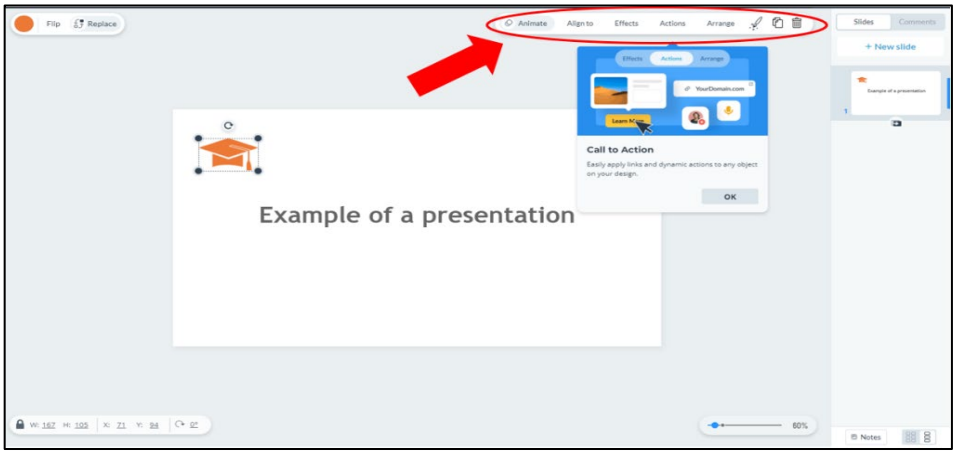

Figure 12. Adding animations, actions, or effects to a presentation in Visme

To achieve different projects, collaborators within a team can edit, pin, add comments or suggestions in real-time. Teachers can also monitor students' or pupils' involvement during activities. Unfortunately, the platform's free version only allows users to present their project online and not download it.

To outline, Visme is an intuitive, easy-to-use platform that sustains collaborative learning-teaching and the creation of interactive, visual content tailored to the needs of digital natives.

3. Psychological and educational implications of teaching through collaboration

Successful collaborative teaching and learning using digital tools can have many benefits for students and can increase their participation in learning process. From students' perspectives, it seems that there are some critical elements which can improve their learning outcomes and their collaboration in online settings as the teacher support, using interactive functions of digital tools, synchronous meetings, clear objectives and goals, opportunities to interact with their classmates through different apps (Lee et al, 2011).

In the previous section of this paper, we presented some relevant digital tools aiming to facilitate collaborative learning. Those resources provide multiple options for building collaborative learning environments by sharing material options, interacting, supervised practical activities, audiovisual materials etc. Those tools, together with a well-structured lesson design and using the right apps for each activity, can significantly increase cognitive processing, motivation, engagement, and well-being. Previous studies have recognized the importance of making dynamic activities by introducing collaborative elements and tools

which also facilitate peer collaboration. (Gray & DiLoreto, 2016). Moreover, building on a collaborative framework with the help of different digital platforms and apps, increase students learning outcomes, help to build social skills and to have positive educational experiences (Aslan, 2015).

An interesting topic to discuss is related to how collaborative learning may contribute to fulfilling psychological needs. According to self-determination theory (SDT; Deci & Ryan, 1985), there are three psychological needs relevant for individual well-being and satisfaction- autonomy (feeling in control), competence (feeling effective and having self-efficacy) and relatedness (feeling connected, understood, loved). When learning design and school successfully addresses these needs, students are more implicated, more active and have positive feelings about their learning (Hsu et al., 2019).

Recently, Ryan and Deci (2020) discussed the importance of investigating the satisfaction of the three psychological needs in online learning settings. Some recent research showed that engaging digital tools together with teachers support and guidance in collaborative activities satisfy the needs of autonomy, competence, and relatedness. More specific, students feel autonomous when they can choose the tools or technologies to learn, they feel competent when they do the learning tasks on different platforms and have a strong sense of connectedness through working with their peers and through interaction with teachers (Chiu, 2020). The platforms and tools we presented in the previous sections, if used properly, can contribute to increasing students' well-being and cognitive, emotional, and behavioral engagement.

From a cognitive processing perspective, collaborative learning using digital tools enhance shared meaning and build contexts for the restructuration of previous knowledge and facilitate shared information through negotiation. (Hernandez-Selles, Munoz-Carril & Gonzales-Sanmamed, 2019).

Regarding the social aspect of learning, it is extremely important to mention that a critical factor associated with the effectiveness of collaborative learning is the quality of teacher-student relation. A good relation is associated with designing collaborative learning communities, a sense of belonging and task persistence (Pérez-Mateo & Guitert, 2012). Teacher social strategies are essential for building a meaningful education.

Conclusions

The success of collaborative learning is at present highly dependent on the teacher's competence to infuse pedagogical content to digital elements, together with constant monitoring, social interaction guidance and support.

The systematic use of this approach at all educational levels will increase students 'learning outcomes and will enhance their adaptability, problem-solving skills, and their capacity to integrate different areas of knowledge.

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