e-mentor
DWUMIESIĘCZNIK SZKOŁY GŁÓWNEJ HANDLOWEJ W WARSZAWIE
WSPÓŁWYDAWCA: FUNDACJA PROMOCJI I AKREDYTACJ KIERUNKÓW EKONOMICZNYCH

2021, nr 3 (90)

Hasan, D. i Rinaldi, M. (2021). Stimulating active participation with class materials using Interactive Document. *e-mentor, 3*(90), 84–90. https://doi.org/10.15219/em90.1525

Matteo Rinaldi

Dan Hasan

Stimulating active participation with class materials using Interactive Document

Abstract

Online learning became one of the most discussed topics during the COVID-19 pandemic. The educational world had to implement and deliver online courses for their students, and millions of students found themselves behind their laptop rather than in class in a matter of weeks.

This article introduces a specific piece of software, Interactive Document, tailored to higher education to allow heightened interaction and active participation with study materials. This article explains the main elements of the tool, including how instructors can benefit from using Interactive Document integrated with Microsoft Teams. Characteristics of the software such as in-line comments, practice questions, anti-skimming features, comment sorting, and the ability to attach files are discussed, with references to use cases where these features were applied.

Finally, a case study from Texas A&M International University is presented, highlighting how Interactive Document enhances students' critical skills and structural understanding, while allowing instructors to have a deeper overview on student performance and interaction with the study material.

Keywords: online learning, Microsoft Teams, FeedbackFruits, interactivity, engagement, active participation, online teaching tools

Introduction

While the COVID-19 pandemic might have taken the world unprepared, the strong evolution and the clear importance of digital technology in education during the last years was a surprise only to some. When the world of teaching was forced to rely more heavily on asynchronous and online practices, having access to good pedagogical software became imperative for higher education institutions. While higher education is heading toward the integration of online teaching and learning, research has shown both benefits and difficulties of online learning in all its facets. Indeed, online learning has to face not only issues such as technological malfunctions (Restauri et al., 2001), but also disruptions of the feedback loop between instructors and students, and the inability to use specific tools when the learning scenario is online (Dumford & Miller, 2018).

However, when implemented properly, online education has also proven to be effective both for students and faculties. Well-crafted online courses make learning more flexible for students, allowing them to focus on the specific parts of the content they feel need more attention, and letting them deploy their preferred metacognitive learning strategies (Kirtman, 2009; You & Kang, 2014). Indeed, in a world more and more dominated by media and digital technologies and where students arrive in the classroom with a higher level of digital literacy than ever before (Hashim, 2018), being able to successfully apply new ways to teach and keep students engaged has become a necessity.

Research has also proven that not only learning but even personal development is positively and strongly affected by student engagement (Astin, 1993; Pace, 1980; Pascarella & Terenzini, 2005); another feature that online learning can enhance.

Students feel the most activated by the material when there is the possibility of frequent and constructive feedback between them and the instructors via what is called

Matteo Rinaldi, FeeadbackFruits, The Netherlands
Dan Hasan, FeeadbackFruits, The Netherlands

supported engagement (Ragusa & Krampton, 2018), achievable, for example, via comments, quizzes, and the possibility to share answers and ask questions among students.

Indeed, one of the biggest struggles for instructors when approaching (online) learning is how to keep their students active and engaged throughout the courses offered; how can quality courses, constructively aligned with the intended learning outcomes, while at the same time keeping students stimulated, be delivered?

Providing an answer to this question is at the core of companies such as FeedbackFruits, whose main goal is the co-creation of learning tools to increase student engagement, not just with course material, but with each other. New tools and learning software, such as Microsoft Teams, have risen to this challenge and have become widely used in the higher education world. However, while they helped collect material and manage its distribution among students, they also came with shortcomings. Above everything, students have reported that these platforms give them the feeling of being merely a way to distribute tasks and deadlines.

Indeed, the main usage of Microsoft Teams is to facilitate both video-calling and the distribution of essential documents and course materials to students. Such software can be enhanced with plug-ins to assist in other tasks in the organization and delivery of these materials and activities. Rather than replacing instructors' existing teaching activities, the most effective use of these plug-ins is to support instructors at a pedagogical level.

This brings the question: in what ways can instructors in higher education make online learning not only comprehensive, adhering to the learning objectives of the courses, but also able to engage and activate students in order to avoid a passive educational experience? And how can online learning tools be used to support these objectives, while at the same time resulting in a simpler way of working for both students and instructors?

This article outlines a specific tool called Interactive Document, built by FeedbackFruits and fully integrable in Microsoft Teams. This tool is able not only to help flipping the classroom, improving the blended approach of a course, but also to activate students in asynchronized scenarios, boosting their confidence on how to analyze complex material and increase collaboration when approaching any content. Moreover, the complete integrability of FeedbackFruits in Microsoft Teams in a single interface is able to combine two powerful tools with good pedagogy, leading to the best learning and teaching outcomes.

Interactive Document in the area of Constructive Alignment

One of the most well-known designs for teaching present at every level of the educational system is Constructive Alignment (CA) (Biggs, 2014). In this teaching design, what is intended for students to learn, and how they should express their learning, is clearly stated before teaching takes place. This happens via the formulation of clear *learning objectives* based on specific "actions" and, subsequently, a series of *teaching/learning activities* that require students to engage with those actions. *Assessments* and *grading* are then the final part of the design, where students are evaluated.

FeedbackFruits' mission, with its Interactive Document tool, is to bring the application of this model one step further in the environment of online learning. Not only do students deserve to harvest the best from their online education and university experience, but instructors must also benefit from the appropriate use of technology that can make designing learning activities more straightforward. The design of Interactive Document takes into account both of these goals. The aim of the tool is thus to help students become more engaged in achieving instructors' intended learning outcomes, and to simplify work for instructors.

Very often, students are asked to read, elaborate on, and analyze a vast amount of information in the form of articles, book chapters, and papers that instructors deem necessary to improve their understanding of a specific subject. However, simply sharing these documents with the students and inviting them to passively read them can easily turn out to be an inefficient and ineffective method of creating engagement and boosting their learning outcomes and skills.

Interactive Document is a low-barrier tool easily integrable in Microsoft Teams, that is able to transform learning into a more both engaging and collaborative experience. Interactive Document, in the words of Dr. Fleur Prinsen from the Rotterdam University of Applied Sciences, "[…] allows students to prepare for the classes so that they have done the reading and also thought about the reading before coming to class." The tool allows users to enrich a document in various ways, adding elements such as practice questions, attachments, sorting learners input, and blocking the view of the document until specific actions are taken by the students.

What can Interactive Document do for instructors in Microsoft Teams, and what issues can it solve?

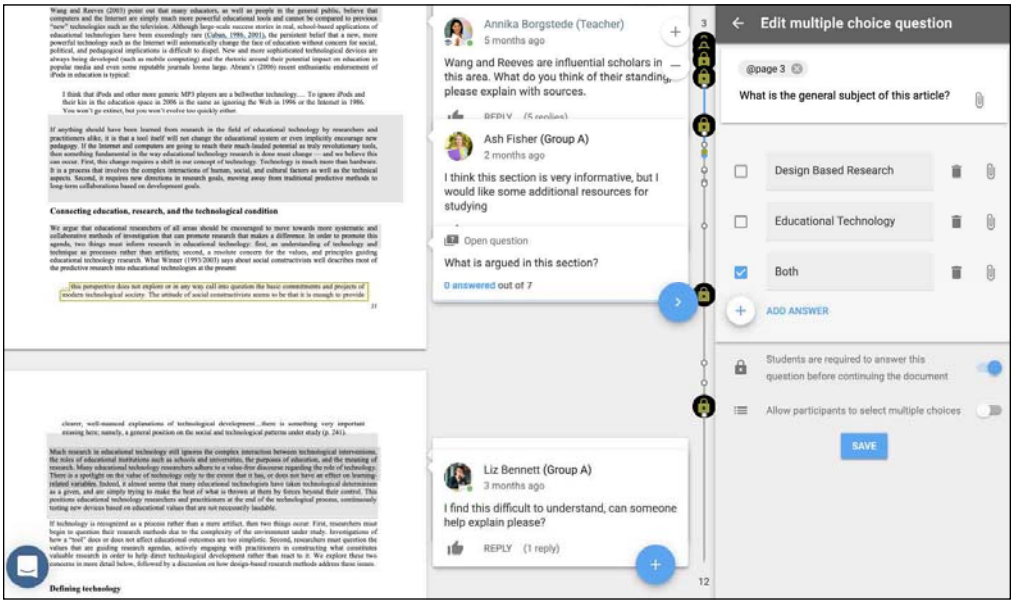
This section presents the main advantages the Interactive Document app can bring to a course when integrated into Microsoft Teams. It will be followed by a case study illustrating the practical use of the app, enriched by the opinions of the course instructor.

- **Increase students' engagement via Practice Questions**
  When students read and digest documents properly, they not only add to their knowledge, but arrive to class well prepared. When this happens, instructors can then focus on specific aspects of the content, knowing that the students are ready to take the next step.
  Interactive Document allows the instructor to add questions and comments in any part of the

document (Figure 1). Students can then comment, read the instructor's annotations, and react to each other's questions and additions, while also answering the quizzes placed by the instructor directly in the document. This not only makes sure that students are paying attention to the document but creates a collaborative environment able to start discussions and transform learning from passive to active.

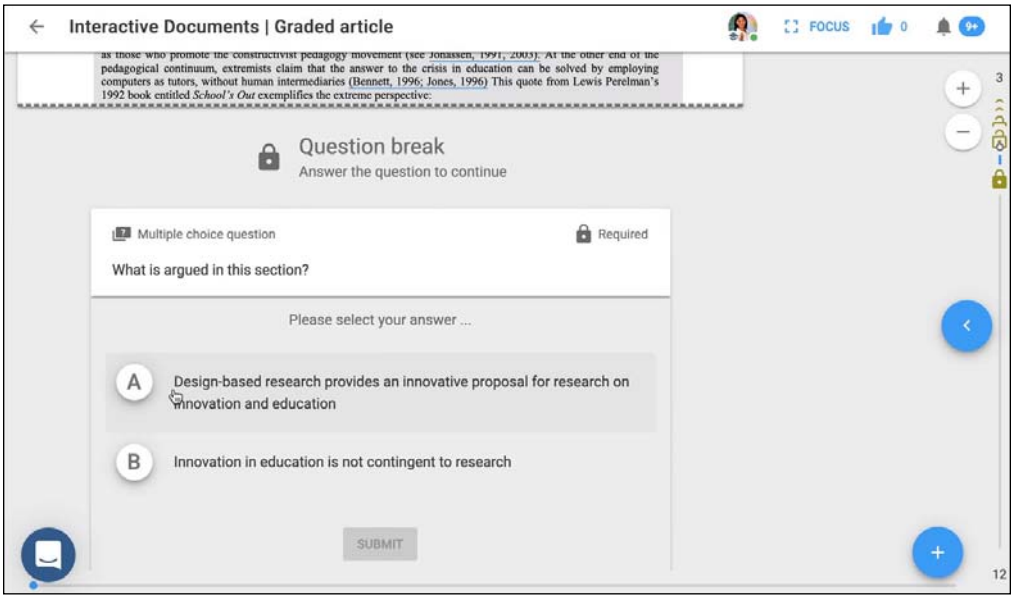
- **More control over students' workflow via locking specific document sections**
  In addition to questions and comments, the instructor is also able to avoid excessive skimming through the document from the side of students. In fact, it is possible to lock, by hiding, parts of the documents that are revealed only after the student answers a quiz or adds a comment to the discussion added via the tool (Figure 2).

Figure 1
Interactive Document – setup interface showing the document, left, and the dialogue to add a multiple-choice question, right



Source: FeedbackFruits platform.

Figure 2
Interactive Document – example of a question break a student must answer to access the rest of the material

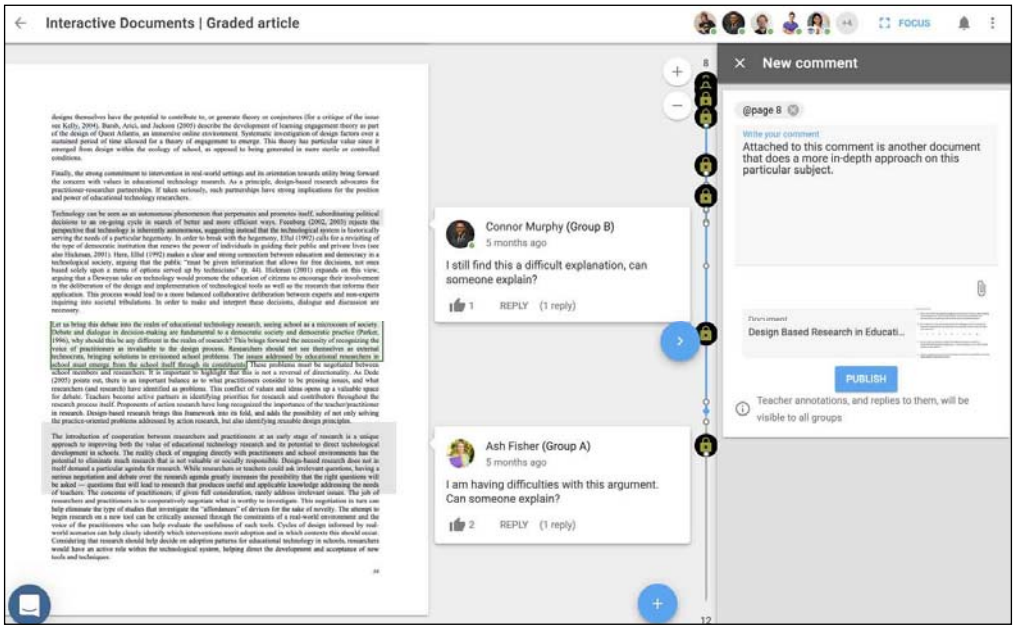


Source: FeedbackFruits platform.

- **More convergence of tools and media via attachments**
  Instructors can add attachments such as other documents, links, videos, and so on to their own and their students' comments (Figure 3). In this way, it is possible to guide students who would like to know more about a specific topic, and to answer by using specific examples and cases.

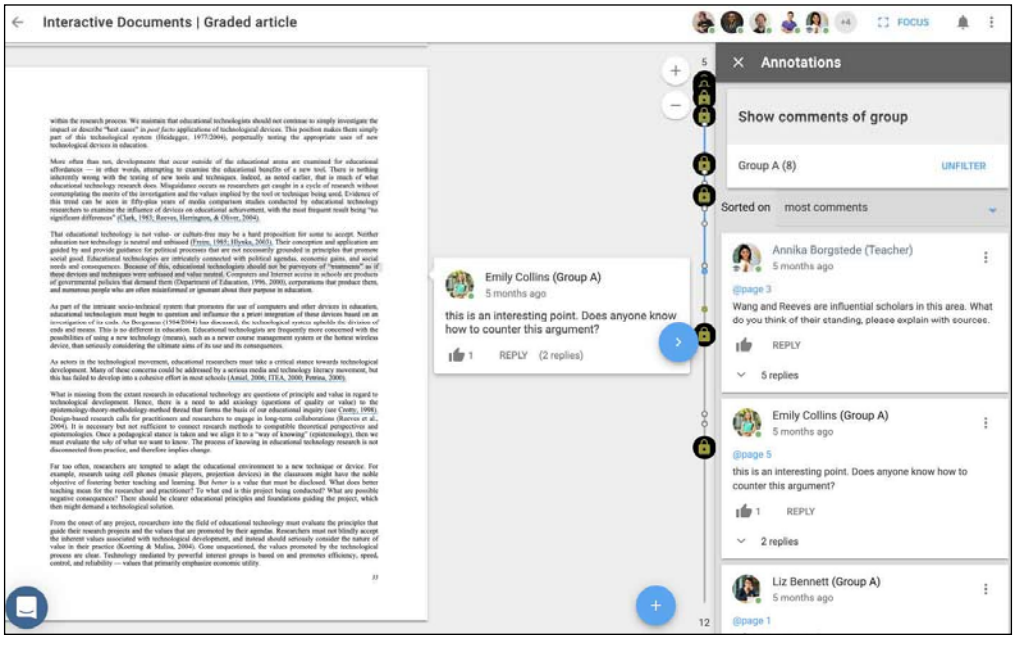
- **Understand student input and learning via comment sorting**
  Interactive Document lets instructors order and/or filter students' comments on a document (Figure 3). This allows for a more comprehensive understanding of students' learning processes by understanding how students consume the article, and to see where students focus more or

Figure 3
Interactive Document – new comment interface where a selected piece of text can be annotated with a comment and optional attachment



Source: FeedbackFruits platform.

Figure 4
Interactive Document – display can filter comments per group (groups can be manually allocated or synced from the LMS)



Source: FeedbackFruits platform.

less by seeing what the most upvoted comments are (e.g. a question was deemed interesting or important to answer by other students). It is also possible to grade students' answers to better emphasize which points should be given more attention.

Improving students' critical thinking skills in a collaborative learning environment with Interactive Document – The Case of Texas A&M International University

Instructors at Texas A&M have been using the tool in several courses and have seen notable changes in several key aspects. When a first-year bachelor's course in academic skills at TAMIU saw the need to improve the collaborative and engaging aspect of a specific group assignment, they used Interactive Document in the context of a specific group assignment.

In the course, students were asked to analyze papers critically in order to create a correct bibliography. To do so, they needed to be able to clearly locate the elements on the papers that needed to be reported, understand how a scientific paper is organized, and quickly identify the key information to be extracted. Quotations used in this section are drawn from a use-case interview with the instructor of that course.

- **Activity Context and Motivation**
  The Interactive Document tool was used in the first weeks of the course to stimulate more transparent engagement with the study materials. "Critical thinking has always been difficult to assess… moreover, the possibility for students to work together online in this way did not exist in the LMS we were using. That is why we started using FeedbackFruits tools."
- **Learning Objectives**
  By the end of the course, students can:
  – Understand how to read a scholarly article and follow the reasoning in it.
  – Identify key sections and where to find particular elements.
  – Become familiar with the structure and characteristics of scientific articles.
- **Learning Activities**
  The instructor uploaded an article with Interactive Document, and the students:
  – Answered in-line practice questions: students answered questions about the text, showing how much they had actually understood and digested it.
  – Followed a given structure: the instructor blocked off parts of text, meaning that only after answering questions (correctly or incorrectly), the following part of the document was revealed, to be sure that the students understood the article systematically.
  – Gave comments and answers: all comments and answers where visible to the other students, so that a collaborative environment could be stimulated.

"I would find the article and walk the students through it, I would then proceed to block specific parts and decide how to present them to the students. Some pieces were presented as a good way to determine the summary, others as a good fit to create a specific part of the bibliography, and so on."

The students engaged with the documents and read every section of the text, including the instructor's comments. They answered the in-line questions, sharing their answers while commenting on the document and their fellow students' ideas.

What are some of the most frequently mentioned outcomes that using Interactive Document offers instructors, and what additional value does it bring students? From the interview with the Texas A&M International University professor, the following features were noted as being most useful:

- **Stop and Think – blocking off sections**
  Sometimes, students skim too rapidly through a paper, missing important sections or information that create confusion when they are asked to use that paper to solve a case or in their future assignments. Being able to block sections of the text was found to be very useful for guiding students to stop and think about specific sections at the right time throughout the article. Written documents and videos can also be blocked off with guiding questions (for example, see the case of Leiden University Medical Center (Hasan, 2020d).
- **More clarity and critical analysis – teacher comments**
  Thanks to the possibility to add comments to specific sections of the document provided by the tool, instructors can add explanations and deeper insight into difficult, important, or interesting topics. In this way, students are guided more carefully and are able to direct their attention to what really matters. Moreover, they can also reply to comments, and upvote what they find most interesting or useful (for another example of how these comments can support learning objectives, see here (Hasan, 2020j).
- **More structural understanding of the material – in-line questions**
  In the experience of Texas A&M instructors, students often had trouble identifying the structure and components of academic papers. After using guided, in-line questions with Interactive Document, the instructor noticed a big improvement in how the students were able to read those articles. This improvement was also reflected in the students' overall performance that was the highest yet for that course. Notably, one Dutch university used FeedbackFruits to

make the whole program more interactive for students (Hasan, 2020i).

- **More insight on students' performance – available statistic overview**
  When students answer a question, upvote, or reply to a comment, the Interactive Document tool keeps track of all these digital behaviors. To see how student analytics benefit instructors even in classes of over 500, see here (Hasan, 2020g).
  This provides insights into students' individual and overall performance, allowing the instructor to check where students are lacking the most in their preparation. This makes it possible for the instructor to prepare their lessons in a more efficient and effective way by going deeper in those areas the students really need to know more about.
- **Less stress for teachers – from statistic overviews and the tool in general**
  The number of insights an instructor can get via the tool reduces uncertainty from the side of the instructor, who now knows more where to focus during their lectures in order to tackle specific aspects of the course effectively. Moreover, Interactive Document lets the students arrive more prepared for the lecture as the instructor intended (e.g. students focus more on what the instructor thinks is important). This reduces stress for the instructor who knows how to structure their lectures in the most effective way possible and does not have to spend time reviewing past homework with the students, since questions and issues have already been taken care of via the tool. For other examples on how FeedbackFruits tools have been used to reduce workload, see here (Hasan, 2020e).

Reading a paper is widely regarded as one of the least engaging and interactive activities for students. The Interactive Document tool, by using all the features explained above, is able to transform the way students engage with a document. Instead of passively reading and moving through sections in an unguided way, students can instead assume a more active and engaged role when consuming the material. In-line questions make students aware of the important aspects of the paper and activate their analytical skills with a right-on-time approach, while the instructor's comments create a collaborative environment where students can reply by asking and answering questions, which is otherwise impossible when engaging offline with a paper.

For the instructor from Texas A&M, "Interactive Document was a much more efficient way to go about the activity. The methods we had before, like post-its," she added, "were not as effective. We wanted them to learn how to read the article, not just how to annotate it." Using Interactive Document, "the students had a better attitude and developed high competency in reading skills."

Indeed, students are more active and focused when reading a specific section if they see that the rest of the paper is blocked from their view, and they need to take a step-by-step approach. The possibility for instructors to know in advance where students encounter issues or problems thanks to the statistical overview of their answers and comments also makes it possible to engage with them before and during the lecture in a more guided way.

Conclusion

As demonstrated by the unexpected crisis in the education world caused by the COVID-19 pandemic, teaching and learning online can be an environment that is both tricky and full of opportunities. Students are asked to perform at their best and instructors have to undergo an even larger amount of work to be sure that their lecture and material can be adapted to the new online conditions. One of the activities that sometimes are applied to an online environment without any substantial difference to offline teaching is to make students read papers, documents, and articles to prepare them for lectures and improve their knowledge and skills on a specific subject. In such a situation, it is easy for students to become passive and bored, and for the instructor to be unable to follow their students' learning process.

Edtech companies such as FeedbackFruits adopted a specific mission to combat these situations: to activate students while making instructors' lives easier; to make every course engaging. It is under this premise that FeedbackFruits created its many pedagogical tools, easily configurable in Learning Management Systems such as Microsoft Teams or Canvas. One of these tools, Interactive Document, tackles the issue of activating students while they engage with papers and articles to read throughout their courses.

By using this tool, instructors have prepared more efficient lectures (Hasan, 2020c). Interactive Document allows instructors to know in advance where students need more help, (Hasan, 2020a) and thus which topics should be stressed more or explained in more detail. Interactive Document has been shown to not only increase student engagement but also to enhance collaborative practices. With the abovementioned characteristics, students engage with each other, sharing material and helping each other toward a better understanding of the content (Hasan, 2020b).

In conclusion, the Interactive Document tool provided by FeedbackFruits helps students to be more active and engaged, with a marked improvement in both their learning (Hasan, 2020h) and their assessment (Hasan, 2020f). It also makes it easier for instructors to create more efficient lectures and allows for clear learning activities that are well-connected to the intended learning outcomes. All this directly in a single interface, accessible through the LMS or Microsoft Teams – a way to seamlessly integrate rigorous pedagogy with all the possibilities that technology can offer.

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Matteo Rinaldi has been working with FeedbackFruits since May 2020. He holds a Research Master in Communication Science and currently teaches at the University of Amsterdam. At FeedbackFruits, he has worked on several projects in the Marketing Team. He is specialized in content writing. His interests lie in media literacy education and content creation skills. More information on his LinkedIn profile: https://www.linkedin.com/in/matteo-rinaldi-uva/

Dan Hasan is an MSc student in Science Education and Communication at Utrecht University and currently works as Teacher Relations at FeedbackFruits, documenting use cases from professors around the world. He also hosts 'The Learning Experience Lab,' a podcast investigating innovations in education technology available at https://soundcloud.com/learning-lab