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Student-Staff Collaboration for Online Courses: Focus on Mathematics

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Abstract: This article discusses different pedagogical strategies including the integration of AI tools to enhance online instructions that focus on mathematics. It examines the benefits of student-staff collaboration and its stimulation for academic success. It explores the reasons a student might opt for online classes as opposed to the equivalent on-site class emphasizing the responsibilities of the students in the academic environment.

Keywords: Online classes, student-staff collaborations, pedagogical tools

Students take online courses for many different reasons. Among the more common ones are other commitments, like family life or work requirements that do not allow them to attend courses at specific times. Online courses allow students to learn at their own pace and schedule. Today's acceptance of online education supports equal comparison with an onsite education. With an Internet connection students have access to different courses and degree programs. Additionally, and quite importantly is the desire on the part of the students to develop their academic independence and prove to them that their commitment to learning can be achieved on a more independent path (Larson et al., 2023)

This paper will discuss pedagogical techniques for enhancing an online course, focusing on mathematics. It will elaborate on the academic roles both the students and staff should undertake to enhance the learning experience of the students. It will enhance the responsibility of the student in an online course as he must understand that he opted for the more independent venue of learning.

PEDAGOGICAL ENHANCEMENTS

Prior to discussing what academic aids are available to elaborate the online experience we want to emphasize that the responsibility of success in an online venue depends on the motivation of the student and his academic commitment and habits. Online learning is not the "easy way out" of taking a course because of a somewhat more liberal timetable (Henrikson and Baliram, 2023)

Teaching a university-level course implies that the student body is mature to a certain degree. Whereas online learning should incorporate a degree of freedom, suggested due dates for assignments are often posted. If a professor does not want to make them weekly for more flexibility, it is good practice to post assignments before the dates of the exams upon which they are based. Posting the assignments late on the part of a student, after the exam defeats the purpose of learning from homework (Davidovitch and Eckhaus,

2024) Primarily, students need a textbook whether it is online or hard cover one. They need to understand that a mathematics book is not like a liberal arts or social science text. Whereas one could be assigned 50 pages of reading in the latter, often 5-10 pages in a math book is reasonable. Pages in mathematics text sometimes need to be read and reread for understanding. Slides including examples introducing the topics that are covered are another plus for a mathematics course. Oftentimes they have fewer words for each concept introduced by the text and hopefully, include additional examples.

Notes that summarize the material are of great value. They should emphasize the most critical points directing the students where to focus in the text.

A good practice is to offer the opportunity to online students to attend the on-site sister courses for face-to-face lectures. Thes students should be welcome to attend whichever classes they choose that do line up with their schedules; many of them could not register for the onsite class because for different reasons all the contact hours did not line up with their commitments.

Some students are pedagogically fond of videos from different venues. The publishing companies of many textbooks produce videos that align directly with the textbook. This proves to be a bonus for the students as the approach to the work is the same or at least similar.

Other students search the Internet to get other approaches for solving problems using those found on YouTube (YouTube ,2026) or from Khan Academy (Khan Academy, 2026) . However, informal (anecdotal) feedback based on anecdotal student reports. dictates that these videos are sometimes confusing for the students.

A pedagogical aid which is recommended for students is Schaums Outline Series (Schaum's, 2026) for calculus or whichever class is being taken. This is a soft covered review book that has few words and thousands of solved problems. Perfect for someone who learns by example. It is relatively inexpensive. Another pedagogical bonus is that of zoom sessions. Once or twice per week the professor can hold zoom sessions to answer questions or elaborate on concepts that are raised by the students.

STUDENTS-STAFF COMMUNICATION

There is no question that we want our students to become lifelong learners. We want to prepare them for the future. Being a lifelong learner means being motivated and self-disciplined. Online courses are one way to accomplish this. Artificial intelligence is and will continue to be integrated into the workplace. As pedagogues we want to support fluency with the latest technology. The best way to do this is to incorporate the relevant tools in our courses. This, however, is where we must set boundaries. The unrestricted use of the AI tools would be detrimental to overall knowledge. Going to ChatGPT (Open AI, 2026) for solutions to homework problems should not be supported. On the other hand, the generation of a hint for a solution when studying can be a useful tool. We should not allow our students to use the AI tools on exams. The obvious reason for this is that it may reduce their motivation to solve problems. Preparing for the exams to enhance their presentations will incorporate the use of the tools into their knowledge base. To prepare for the overall benefit of society, we need to help our students develop problem- solving skills.

The professor needs to articulate the requirements of the course at the beginning of the semester, including how exams will be administered (Larson, et al., 2023). At some institutions online exams with a specified due date, to be taken on the honor system are accepted. Other institutions of higher learning require onsite exams even for the distance learning sections. With good administration, those students who live a significant geographic distance must arrange for a proctor local to them and the institution's administrator will communicate with the proctor directly.

One way to foster a strong partnership given the potential pros and cons of AI use is to have the students compare the results of different AI tools for a given project. Based on this, they can develop their own ideas and enhance the AI results (Ben-Jacob, 2026).

Students need to partner with the staff. To promote their educational experience, they need to inform the staff what works for them. Rarely does one pedagogical strategy work for just a sole student. They need to articulate which tools they found helpful. Some students are just too reticent to articulate what they need. The next generation of learning, online and onsite as well as AI is in the hands of our students. They can write a report suggesting their opinions of the impending uses of AI from their perspectives and what limits should be placed on AI in education. They can write a report on which tools strengthened their independent learning and why There is no such thing as a silly or "dumb 'question or opinion (Ben-Jacob, 2026).

The use of innovative tools should be used to promote deeper analysis of scholastic concepts via discussions and questions. These tools should be used to guide, not just produce final answers. Shared decision-making using AI as a tool for collaboration is a bonus. These tools can be implemented for research planning as well. (Clune, 2025).

Working with staff, students will become familiar with AI literacy, which is necessary for their future endeavors. Their creativity will be supported. They will save time on scheduling tasks. From the other perspective, we do not want students to become overly reliant on technology.

CONCLUSION

Concerned, pedagogues need to work collaboratively with students to enhance the academic environment and promote the learning future of students, and thus our society both online and onsite. There are numerous tools to support pedagogy but the bottom line, independent of the venue, is that the major responsibility for learning lies with the students.

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