

MERGING WORLDS: WHEN VIRTUAL MEETS PHYSICAL – AN EXPERIMENT WITH HYBRID LEARNING*

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ABSTRACT

Online enrollments continue to grow at many institutions. However there are some legitimate questions that can be raised about the student experience in online only classes. In this paper we describe a “hybrid” approach that tries to combine the better of two worlds, i.e., the better features of the traditional face-to-face classroom instructional format and the “pure” asynchronous online format. Our goal is to offer online students some of the experiences that face-to-face students have in class while also retaining much of the flexibility that comes with an online format. The main benefits as we see them are in increased involvement of the online students with their peers in the physical class and a higher level of engagement that we believe will result in a better student experience and better student outcomes.

INTRODUCTION

Many educational institutions have started offering online classes to their students to both accommodate their current students’ schedules and also to offer classes to more potential students as enrollment in computer science programs has fallen nationwide over the last few years [4]. Concerns about the level of student engagement and involvement in online classes are legitimate issues that are often discussed when the move to an online format is considered. It also remains a concern once those classes are in place. It is believed that online students often feel isolated from their peers in the traditional classroom and are also harder to engage at the same level as their face-to-face peers and that their involvement with their learning activities consequently suffers. [10]

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In this paper we consider an alternative to the “pure” asynchronous online format when it is offered in addition to, or in place of the traditional classroom instruction format. We believe that this approach leads to greater student satisfaction for on-line students while at the same time allowing them to achieve the learning objectives.

It will be useful to define our terminology for the purpose of this paper. We differentiate between three instruction formats: Face-to-Face, Online and Hybrid. Briefly, face-to-face corresponds to the traditional in-class instructional format, while the “pure” on-line format consists of a virtual classroom where students attend from remote locations. The Hybrid format we will describe in this paper tries to combine these two approaches to provide students with a better learning environment.

TRADITIONAL FACE-TO-FACE AND ONLINE CLASSES AND THE HYBRID

The traditional face-to-face format is the most common delivery method used in education. The benefits of this model are many and well understood. The disadvantage for the students and the instructor, such as it may be, is the requirement to be physically present at a prescribed time and place.

The online approach offers an alternative for those students who cannot regularly attend a physical classroom. As these classes are online and asynchronous, students are not limited by either location or temporal restriction which affords them greater flexibility in arranging their schedules. Critiques of the online format from the instructor’s perspective include the potential lack of engagement by students, the inability of the instructor to interact in real-time with his or her students [9] and the inability to “read” the class by observing their body language and facial expressions [6]. From the student’s point of view, online instruction can leave them feeling isolated [10] from the rest of their peers aside from e-mail or online chats.

Our hybrid model will combine features from the face-to-face and online instructional formats. This mixed format will add a synchronous element which will require online students to be present at a specific time so that they can join their face-to-face classmates during class activities and discussions. This joint session will be shorter than the duration of a regular face-to-face class in order to accommodate the constraints of online students. To compensate for the shorter meeting time, students are expected to complete pre- and post-class activities and participate extensively in asynchronous discussions via e-mail lists. It was our hope that this would both satisfy face-to-face students and better engage online students.

HYBRID APPROACHES

The Sloan Consortium survey of 2472 US private and public institutions defines blended learning as “having between 30 percent and 79 percent of the course content delivered online.” [1] However, the term “blended learning,” typically takes on a variety of meanings ranging from the addition of limited online content to face-to-face courses through fully online courses that include some synchronous communications medium. Students exhibit an overwhelming preference for some form of blended learning. However, academic leaders remain hesitant to make a choice between pure online and blended formats [1].

Synchronous learning environments provide a dialectic learning experience, high levels of interactivity, opportunities for spontaneous communication, instant reinforcement of ideas, control over the pace of the learning experience, and freedom from spatial but not temporal constraints [7]. Conversely, asynchronous learning environments delay reinforcement of ideas, result in an increase of completion time, and may contribute to increased student attrition. Benefits of asynchronous learning environments include the opportunity for students and instructors to improve the quality of communication due to increased reflection, no time and place constraints, and the ability to differentiate content [7].

A comparison study that measured students' sense of community between asynchronous and synchronous learning modes found that students from both diverse and non-diverse populations felt significantly more connected in the synchronous learning environment [8].

Researchers at the University of Indiana combined students from face-to-face sections with distance sections. Students were allowed to participate in both asynchronous and synchronous environments. Participation increased most when the two sections used synchronous technology to bring face-to-face and distance students together for lecture and discussion. Students preferred live feedback and discussion with other students and instructors over asynchronous feedback, but they were also concerned with time and technology issues experienced in the combined sessions [3].

Researchers from Mercy College in New York instituted blended courses to alleviate the financial impact of fewer students taking face-to-face courses and the associated costs required to maintain a physical campus. The blended course resulted in good peer support between the two delivery modes and students reported increased engagement over online only sections [5].

THE FRANKLIN EXPERIMENT

The hybrid pilot was run in the fall 2008 semester in a 15-week 4-credit upper division computer science class focused on Java-based web application development. The average undergraduate CS student at Franklin is 35 years old and works full time in addition to taking courses.

At the time of the pilot, enrollments for the course were low and split at four face-to-face and six online students. As our minimum class enrollment is 10 students, the face-to-face section would normally have been cancelled and those four students moved into the online section. Since several of the students held F1 visas that require face-to-face classes, we conceived of the hybrid to meet student needs.

The hybrid approach tries to bridge the division between online and face-to-face students by designing learning around weekly synchronous classroom sessions where both groups can "meet." The key features of this approach are required but ungraded pre- and post-class learning activities that bookend a synchronous recitation. In deference to the online students, many of whom chose online due to its flexibility, contact time was not required (although the sessions were recorded for later viewing) and limited to 90 minutes of intense recitation and discussion. To make up the contact-hour difference in a 4-credit course, the course design was altered substantially: the face-to-face experience

became more like online while the online simultaneously became more like face-to-face. See Table 1.

	Face-to-Face	Online	Hybrid
Synchronous contact	4	0	2
Outside activities	1	5	3
Readings	2	2	2
Assessments	3	3	3
Total	10	10	10

Table 1: Time distribution (hours per week) of student learning activities.

The importance of course design in this scenario cannot be underestimated. With limited contact and a mix of delivery modes, there was little room for error. Each week consisted of five main structures: readings, initial learning exercises, discussion and recitation, follow-up learning exercises, and assessments. Of these structures, only the assessments (e.g. labs or homework problems) were marked. Students quickly realized that they had little to contribute to or gain from the discussion/recitation without first having done the readings and the initial learning activities. At the conclusion of the synchronous session, face-to-face students spent considerable time in the classroom working on the follow-up learning exercises. Online students usually disconnected from the meeting, although they had the option of remaining connected and soliciting additional help from the instructor.

The response to the hybrid course was encouraging. A survey of the 10 students yielded 6 responses (two from face-to-face students, and four from online students), all of which were positive. Compared to both standard face-to-face and online classes, all respondents agreed that the hybrid format offered them more opportunities for participation and held their interest more. Likewise, all students found value in the synchronous recitation/discussion. What was most interesting, however, was that all face-to-face participants preferred the hybrid format over pure face-to-face instruction. Likewise, all online participants preferred the hybrid format over pure online instruction. Finally, all respondents would recommend the hybrid course to their fellow students.

In the free response section of the survey, students reported that being able to hear and participate in the face-to-face discussion was of great benefit because “more questions were asked and answered than [in] a typical online course.” Students suggested two technology changes to improve the format. First, several online students mentioned that a live video feed of the classroom would be particularly helpful to maintain connection with their face-to-face peers. Second, the face-to-face students suggested that the “push-to-talk” microphones were obtrusive in the classroom environment and that a transparently equipped classroom would have improved their experience.

SUPPORTING TECHNOLOGY AND PROBLEMS

At Franklin we can draw on many years of successful experience providing face-to-face and online instruction to our student body. The technology infrastructure that supported the hybrid experiment consisted of:

- a computerized classroom equipped with PCs for each student and the instructor
- a video projection system
- virtual meeting software capable of displaying slides and recording sessions
- a combination wireless microphone and speaker system for each student
- a wireless lavalier microphone for the instructor
- a mixer to handle all the audio inputs and outputs

Anyone who has taught on line knows of the perils of having to depend on technology. Aside from the usual problems of equipment and network vagaries, we have identified the following as potential problems for the hybrid approach:

- Scheduling for online students. As mentioned previously, many students choose online delivery formats for flexibility. In this hybrid format, some of that flexibility is lost. We addressed this by making the synchronous sessions optional but recording them for later playback for those unable to attend.
- Training for instructors. The additional equipment (microphones, speakers, mixers, cameras, etc) and software needed for a hybrid format is not typically part of the standard knowledge base of a face-to-face instructor. Training, particularly on hardware issues (i.e. microphone feedback or equipment failures) becomes very important.
- Multitasking for instructors. Using web meeting software, instructors must now divide their attention between the face-to-face students and monitoring the live text chat in the virtual meeting software. One possible solution would be to require microphones for all online students and switch to verbal interrupt processing.
- Backup plans for outages. Network, server, and software failures can take out the entire online population! Coordination with university technology infrastructure groups for contingency plans such as audio-bridges is vital.

We encountered all of the aforementioned issues, yet were still able to meet the needs of both face-to-face and online students. To make the hybrid delivery format a successful and permanent fixture of our university, however, will require additional testing and cooperation with our technology infrastructure group.

CONCLUSIONS AND FUTURE WORK

We strongly believe that the pilot benefitted all parties involved. The university benefitted in that it both met student desires for face-to-face instruction and it kept costs low by using only one instructor for two sections. The face-to-face students benefitted in that they had the classroom experience they desired as the alternative outcome would have been the cancellation of the low enrollment face-to-face section. Finally, the

instructor and the online students both benefitted from a more engaging and diverse learning experience via the inclusion of the face-to-face students.

We should also note that the trade-off for the traditional online student with the hybrid approach is that he or she is required now to be “somewhere” at an appointed time. While they can participate from any location, they now must accept the fact that they will be expected to be present “in class.” We believe that this is a small price to pay for a more substantial and beneficial student experience. More importantly, our survey of students supports this idea and agrees with the conclusions reported in the Sloan Consortium study [1].

We share the belief that the principles of effective teaching both on-line and face-to-face have much in common, though they must be adequately designed and adjusted to the given delivery mode [2]. Our hybrid approach was designed with the same principles in mind but tailored for this new environment. We think we were successful, and we intend to further refine our design in successive iterations. To that end, we are running a subsequent hybrid class in the summer term, 2009, and hope to report on our findings in a future paper and presentation.

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