

Keep Nose Above Water

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Abstract: Valley City State University (VCSU) is a small public institution of about a thousand students. In the spring of 2009 a severe winter followed by a near-catastrophic flood closed the campus nearly a month prior to the normal summer dismissal. It was determined that courses should be continued online. Although this was impossible in some cases, the majority of classes did proceed in this way with some notable successes. This paper considers some of the remedies that were applied during this time of extreme stress.

Introduction

In this case “keep the nose above the water” is not the advice given to freshman faculty, but describes determination for tasks both physical and metaphorical in one eventful spring. It was one of those years that the faculty members who survived it will tell to junior faculty for decades. The Northern Plains are subject to the vagaries of severe weather, but this was unusual even for here. The fall semester of 2008 was colder than average but not record breaking. The spring semester turned nasty in a rather unexpected way. An ice storm caused cancellation of afternoon classes on February 9. A snow storm cancelled all classes on March 10 and morning classes the next day. It has been common for the local elementary and secondary schools to have at least one snow day. It is much less common, but not unheard of for colleges to also cancel classes for inclement weather. On March 25th and 31st it happened again, classes were cancelled due to snow. The author has more than 30 years of experience in higher education and no recollection of three days of cancellation in a single year.

The old saying is “hope springs eternal in the human breast” and indeed by April it was beginning to thaw and hope was rising. Unfortunately, this thawing compounded the problem. The National Weather Service had begun to issue flood warnings and the probable river crests they predicted would be catastrophic. VCSU is located very close to the river on its north side and this river started to rise. The city went into a state of emergency with frequent requests for citizens to volunteer in the flood efforts. These usually occurred in the afternoons and evenings. April 1st saw a typical call for volunteers to start at 3:00 PM. Classes are cancelled again April 3rd and 8th so that students could volunteer to fill sand bags or build dikes. The students left for Easter break on April 9, not aware they would not be able to return.

This was not a local situation, other cities in the region had similar problems. Interstate 94 had water crossing it east of Valley City but was still passable and it was closed altogether to the west. There are seven bridges in Valley City and only one was still open at this time. Normally the campus may only be approached via four streets, but at this time three of them were closed. The only open street had the least desirable access. The street sat on a steep hill and at the bottom of the hill it was narrowed to one lane due to a contingency dike. The president issued a mandate on April 9th closing the campus to most vehicle traffic. The only access to the campus was to be via shuttle bus. By April 12th, which was Easter Sunday, the water has risen past the record flood level dating back to 1882. The mayor called for voluntary evacuation of the city on April 14th because the sanitary sewer was on the verge of collapse. By April 14th the president had no options other than to close the campus. Face to face classes for the remaining month of class could not be held because of a lack of campus access. If at all possible all classes were to be converted to some type of online experience. Instructors were strongly encouraged to make the best of a bad situation.



Figure 1. Primary and contingency dikes. Photo taken from roof of building containing author's office on April 15, 2009.

The creation of an online course is an involved operation at best. Creating online courses quickly is much more difficult. Complicating this task were several other issues. These included the natural concern that many faculty members had for the safety of their homes, the difficult access to their offices and the necessity to move the data center. The students had left expecting to return and they did not always take with them their text books, notes and other materials. Creating online material is hard work under ideal circumstances and these were far from ideal.

The rest of this paper considers some of the remedies employed and how they fared.

Infrastructure

In April of 1997 an even more catastrophic flood caused extensive damage in the city of Grand Forks and caused the cancellation of classes at the University of North Dakota. Cancelling classes and continuing them online are two far different results. The difference between the response of VCSU and UND should not be perceived as an indication of the comparative quality of the two institutions. Rather the difference is the progression of technology that has occurred in the last twelve years. In 1997 there was no Google, no Facebook, and no Twitter, Amazon and eBay are still start-ups and the majority of Internet users lived in the USA. Today things have changed and this change allowed VCSU to continue in the face of great difficulty.

VCSU is a laptop university, every faculty member and every student has a leased laptop. This implies above average computer literacy. Students may not have taken textbooks when they left for the Easter break, but they generally took their laptops.

Although the VCSU data center was down for several days while it was moved to higher ground, it was perceived to be the key to success in the last weeks of the semester. VCSU policy mandates email as the official means of communication. Therefore, it is routine for student papers to be turned in as Word® documents rather than on paper.

Faculty extensively utilize the Blackboard Learning Management System (Blackboard, 2009) for face to face classes as well as online classes. There is also considerable experience with the Wimba Classroom system (Wimba, 2009). A variety of other online systems (Hill, 2007) are also in use.

Shortly after the evacuation of the campus, the data center was functioning in the Regional Technology Center (RTC), a local business incubator, with connections to VCSU. In addition to the data center, the M*A*S*H (Mobile Academic Support Headquarters) was set up at the RTC. This provided a physical space where faculty could be assured of having a usable work space, telephone and internet connections, as well as immediate access to an instructional designer.

General Strategies

As might be expected there was a considerable range in what approaches faculty used to finish the class. The faculty effort resembled a bell curve, with some providing exemplary efforts to provide real learning opportunities, others unable to produce but a little online content and most somewhere in between these extremes. The courses with significant laboratory component were particularly hard hit. A ceramics course without pug mills, kilns, potter's wheels and workspace is not a class. The science courses could continue but could only encourage students to seek out high school laboratories and the like. It was very difficult for these instructors to penalize students who could not access such facilities. It should also be clear that most high school science laboratories do not measure up to what a college campus should have, especially in a sparsely populated state such as North Dakota.

There was a smaller range of student expectations. It is safe to say that most students thought that the semester was effectively finished. Unlike the faculty and administration, they were not anxious to find ways in which learning could continue. Once it became clear to students that this was not the case another predictable thing happened. The better students usually took up the challenge and the lesser ones were less enthusiastic.

There were also serious issues with internet connectivity. Students from an economically deprived background do not usually have the access that more well-to-do students possess. Rural students are less likely to have broadband than urban students. Students from outside of North America that left for the summer – not all did – would have difficulty in synchronous communication, such as the use of a Wimba classroom. Many students without home internet went to libraries and internet cafés to do their work, but if all they had available was a dialup connection they were excluded from audio, streaming video and other data intensive communications. The faculty then had to determine if the student was genuinely unable to do the work or just making excuses to avoid working. The administration supported the effort by making numerous calls to parents and relatives to verify situations and encourage cooperation.

Most faculty members attempted to provide a meaningful way to complete the semester. However, the backup plan was often an offer to the students to take one of several options. One option was usually to take a particular grade, often one letter grade below what was currently assigned. If this was a course that was not within their major program, they were doing well in the course and they were having difficulties in connecting to the online materials, then students saw this as a viable option. The option to take an incomplete was also possibility. There was an implied promise to allow the student into a future version of the class without cost. This was not an option for many because of athletic eligibility and scholarship requirements, but was accepted by some students.

These offers had another effect. They demonstrated to students that there was no easy way out of this situation. The option that the semester would be cancelled and they would receive their current grade was effectively removed.

Institutional policy requires each course to have a minimal Blackboard entry. What became important was for that entry to be augmented in a way that would allow students to do significant learning with it. The Blackboard course was no longer an online means for posting assignments, making announcements and citing other resources. Instead, it was usually developed into the main point of contact between faculty and students.

The students left for the Easter break without the realization that the campus would not reopen that semester. Many left without textbooks, therefore scans of important portions of a text were often placed in the course on Blackboard. The faculty hurried to find other resources that would supplement the course, since face to face contact would be missing or rare.

Many students at the institution come from a small geographical area around Valley City. It was often the case that faculty would meet with students in the surrounding towns that were not having flood issues. This could be single student meetings or groups that lived relatively close.

Space allows only a few courses to be described here, but this may show the range of techniques that were utilized.

Example: Programming Courses

Two programming courses had very different outcomes. One was the second semester of a C++ course that is on the primary sequence. This particular course was a hybrid course with a strong online component. This course had a web page that had previous and some future PowerPoint® presentations on it. It also used a MEP (Hill, 2007),

a visualization enabled hypertextbook that functions as a textbook to provide content. It provides a number of other services as well, including monitoring student progress, hosting interactive exercises and delivering assignments when a student has completed some needed tasks. This system has been used to support a purely online course. Students routinely email their program source code for assignments, for both the final version but also to ask questions concerning compile, run-time and other errors. They receive replies in the same way. This class was easy to convert to a fully online course. The students were already used to all the online mechanisms and so it was relatively painless.

There was also a Java course with a much different situation. This was a class with no prerequisite and it is one way to satisfy a general elective. It is a recommended elective or requirement for several programs, so there is a wide variance in the student experience within the course. Like the previous course, it had a web site for presentations and other information. The students were also used to communicating with email and attaching their Java code to email. However, they were a less sophisticated group of students and they used a textbook instead of the online resource.

The primary solution for this course was serendipitously obvious. Since PowerPoint® was the primary means for accompanying lectures, a Java applet to play the audio of a lecture along with the display of slides from a presentation was the obvious solution. The captured presentation (Hill, 2009) was originally designed to be embedded within the MEP. This applet may also be embedded within normal HTML as well. Figure 2 shows the player for the presentation.

The process for creating the data is straightforward although tedious at times. A presentation given to a class is recorded for audio. The slides may be extracted directly from the presentation manager, in this case PowerPoint®, as individual files in JPEG format. A sound editor is then used to break the recorded audio into clips, where one clip per slide is required. Once this has been done, the graphics and clips are put into a Java Archive file and the parameters of the applet are directed towards this jar file. The applet uses two JAR files, one contains the applet itself and does not need to be modified, the other is specific to this particular presentation.

A similar course had been taught over Interactive Video to a Tribal College during the same semester with the following procedure. The PowerPoint® presentations were placed on the web site before the presentation was given. As soon as the editing on the audio and collection into the archive file was complete, the original presentation was removed and the applet replaced it. This allowed students to view and hear the presentation at a later time. Since these students were at a distance it was inconvenient to visit the instructor's office.

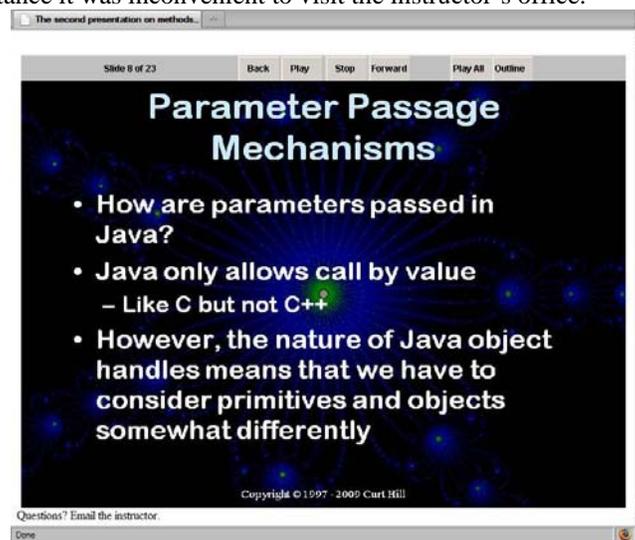


Figure 2. The recorded presentation player.

The player applet has simple controls as can be seen in Figure 2. The only unusual button is the outline button, which is the rightmost item. It will display the text in outline form. Students may print this and take notes on the outline while they listen to the audio. Unlike most presentation managers there is no animation or partial display of slides.

Some time before the adjournment of classes the author happened to mention to the local class that the remote class had these recorded presentations available. The students in the local class wanted access to these so that they could use these for test review and the like. It was not the delivery that they had seen, but similar. It was also a happy accident that prepared the class for the flood adjournment.

Later, when the campus was closed, the procedure for generating these presentations was changed. Instead of recording a lecture live in front of a class, the recording moved to the studio, which is just the instructor's office. The office procedure gave a rather better product as well. There tends to be better sound recording, less room noise, no questions or other disturbances that must be edited out. Moreover an unsatisfactory clip may be immediately redone. However, the natural enthusiasm that an experienced classroom instructor gives to a live class is usually dampened when the instructor is talking to just a microphone.

The recorded presentation does not have the same presence for the student, just as a video-taped lecture is not the same as hearing it in person. There is no immediate ability to ask questions, although it is much easier to stop the presentation, back up and play it again. It did give some resemblance to still having a course instructor. The presentation may be viewed at any time which is helpful in accommodating schedules and time-zone differences.

Example: Algebra Courses

The recorded presentation approach was not as suitable for an algebra class. This is not to say that presentations may not be used in mathematics courses, but it is less frequent. Moreover, one of the important learning opportunities that exist in this type of course is when the instructor works through the solution of a problem. This could be done in a presentation, but the insertion of the specialized mathematics notation into a slide is usually a time consuming process. It cannot be easily done in real time such as the response to a student question.

One instructor was in the habit of starting every class with an initial Blackboard quiz, which could not be made up. The quiz was open only the first five minutes of the class period, which encouraged students to not only to be prompt but also to maintain progress on the assigned material. That was nearly the only part of the class that translated well into the online phase, although the quiz was kept open for a somewhat longer period. The principle content was by self-directed readings of the textbook and other materials. The other materials were whatever could be found and included YouTube demonstration videos, Java applets and anything else that added a new perspective to the content material.

Another instructor took a more technologically proactive approach and used a Wimba Open Classroom to have something that approximated a real class session. Figure 3 contains a screen shot of a Wimba Open Classroom.

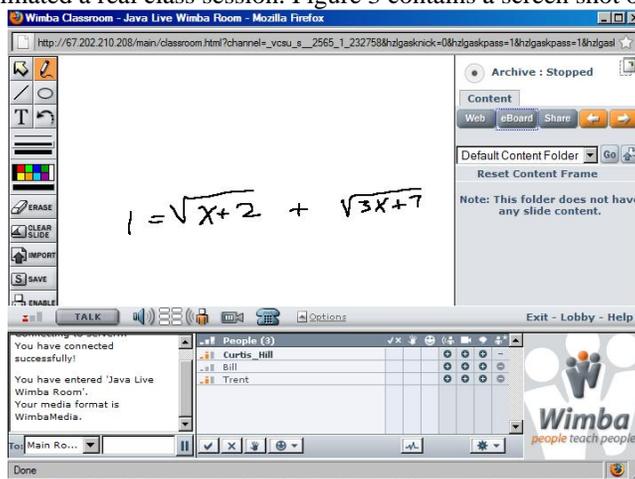


Figure 3. A Wimba open classroom - instructor view.

The Wimba Open Classroom is an online meeting space where one person, usually an instructor, controls what is displayed. Each person present may hear streaming audio from anyone present. Presentation slides may be displayed, a white board is available and application desktops may also be shared. Although not shown in Figure 3, any user with a webcam can appear in real time. The presenter may grant to any or all students the right to use the whiteboard or show an application on their machine. There is a list of names of students at the bottom. The session

may be recorded for later viewing, although the normal usage is synchronous. The term Open is applied in that any student may enter the classroom as long as they have the proper URL. The instructor needs a name and password to control the session. There are also Closed classrooms that only those who are members of the Blackboard course may enter.

The other item needed to make this system usable, considering the amount of writing to be done on the whiteboard, was a tablet. In most cases a mouse is more difficult to use for writing than a pen. There were several tablets available, so one was borrowed to enable the course to proceed.

In Figure 3, the whiteboard is being used to start the solution of an equation. The instructor's audio is generally always on, while the student has a push-to-talk system. Thus the processing of the equation is in view of all present students and it proceeds somewhat like it would in a classroom. Students may ask questions and obtain immediate responses. Should the instructor not desire audio interruptions, the student audio may be suppressed in favor of visual signals. The student may indicate agreement, confusion or existence of questions through the icons at the bottom of the window. The instructor can then deal with these at a convenient time. Student who might not ask a question in class, may be more likely in this situation, since only the instructor will know from whom the question originated.

This setup worked passably for students who had good internet connectivity. Clearly it was a hopeless situation for those with either dialup connections or no connections.

Another issue that loomed large was the need to properly administer tests. A multiple choice Blackboard quiz has its usefulness, but has some issues in regard to a full test in a mathematics course. Certainly ACT and SAT have managed this but the preparation time can be large.

The solution most often used was to find proctors in all types of locations. Most of these were teachers or librarians. Since most high schools were still in session, most students went to their old schools and supplied the names of someone that still remembered them. Tests were faxed to this contact and then mailed or faxed back. It was substantially more effort than what would have been the normal case, but there were few other viable options.

Example: Public Speaking Course

With the students dispersed, it was impossible for the instructor to observe the students deliver a speech in person. This problem was not difficult to overcome. The plan was to have each student video tape the speech, being careful to show the audience prior to the speech. This did require the students to assemble the audience and take care of the technical difficulties of the taping the event. This caused some of them stress, but was a good learning experience. They could then send a tape through the mail or stream the video through the internet for the instructor's inspection. The technical level of the students at a laptop university is such that the greatest problem was the delivery of the speech itself, not the technical details surrounding it.

The more interesting application of technology in this class was the use of a Wimba Open Classroom to enable group meetings. One of the requirements of the class was a group presentation, which necessarily were preceded by several group preparation meetings. These groups were organized prior to campus closure but needed to meet online after the students were dispersed.

Each group had a student leader, who organized the meeting. Each student was required to borrow or buy a web cam, so that everyone in the meeting could see streaming video of each of the participants. The instructor generally visited the meetings, but never participated – a silent viewer only.

Students who did not participate in these meetings could be expelled from the group by the student group leader. Non-participation would detract from every grade in the group, so the leader is the best informed to make that decision. Those who had been removed from other groups were formed into another group, dubbed privately the "skulkers" group. Contrary to what may have been expected, this group performed rather well. It would appear that the students realized that this was their last chance for an acceptable grade and put forth the effort necessary.

Observations

In an uncertain world it behooves any institution, whether business or education, to be prepared for the unexpected. Floods, hurricanes, earthquakes, wildfires, pandemic outbreaks (Young, 2009) or terrorist attacks are all dangers that could seriously impact an educational institution. The stakeholders of the institution will be much more

willing to do the extra work of recovery knowing that the institution did what it could to mitigate the disaster. Consider the following partial list of lessons learned.

- It is essential to have a disaster plan. It will certainly not cover every possibility, but it will give direction and confidence when it is most needed.
- The more online capabilities that are present within the faculty and students the easier it will be to become more fully online in the event of relocation (Young, 2009). VCSU was fortunate in that everyone was familiar with email and Blackboard (Blackboard, 2009), it was not something they had to learn while away from campus.
- Off-site data center backup should be routine. Servers may be replaced, but lost data is irreplaceable. Since the flood VCSU has increased its server and storage capacity so that it may host another institution in a similar position. Virtualization of servers makes this much easier (Meadow, 2009).
- Alternate contact information is very helpful (Meadow, 2009). If the data center is unavailable and people are scattered, is there a way to contact them?
- Grade early and often. The more information available the more confidence that the grade is just. Faculty who relied on a single final examination were at a considerable disadvantage compared with those who tested regularly.

Ultimately, only 12% of the scheduled courses were terminated when the campus was closed. In contrast to these were 13% of courses that needed no adjustment. This latter group included internships, student teaching and existing fully online classes. Since they were off-campus they were not seriously affected by the flooding. A decade or two ago these would have been the only ones that would have normally completed. Classes that were able to complete by shifting to an online format comprised 56% of the course offerings. These should be considered the technology bonus. Another 11% of the classes continued primarily through email.

In 1996, when the University was considering becoming a laptop institution the author had concerns of the wisdom of the choice. It seemed clear that certain disciplines would make full use of the tools for educational advantage. It was not clear if many other disciplines would do so. However, at the time the faculty as a whole endorsed the idea, not with just a vote but with their time and effort. In just a few years, paper assignments to be turned in virtually vanished and lectures routinely included PowerPoint® presentations. A similar thought occurred to several faculty at the time of the announcement of the online classes – this will be a disaster. Yet, the faculty as a whole embraced the idea that it could be made to work and the results are gratifying. No sane person would suggest that classes be cancelled and made completely online as we did for no good reason, but the catastrophe was averted and the institution also kept its nose above the water.

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