Course Administration:
The Often Neglected Component of Technology Infusion

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Abstract

Technology infusion and new pedagogical methods create an extra load on the faculty that introduces them. However, course administration techniques, that enhance the instructor's working capabilities to cope with this extra load, are seldom provided. This sometimes leads to failures in faculty development efforts. In this paper, we discuss real life experiences in teaching technology infusion and modern pedagogical methodology while also including course administration techniques. We present such experiences in Third World institutions where, due to economic and infrastructure limitations, tools such as Course Administration Software cannot be used. We instead substitute them with standard software tools, which are then integrated with modern pedagogical and technical principles, into our entire teaching approach. Examples and results are presented.

Introduction and Background

There are ubiquitous ongoing efforts, these days, to introduce new pedagogical methods and new technology in the classroom. These efforts are taking place worldwide: both in affluent and advanced countries such as the US and in Third World ones in Asia, Africa and Latin America. In these latter ones, however, the infrastructure and the economic power of educational institutions are much lower. But in all, we are facing a common and crucial problem: helping the instructor cope with the new methodology and technology!

The educator, it is good to remember and recognize, is also a human being. As such, educators have a life including spouses, children, friends and a career development to pursue. Educators also have legitimate time-consuming needs and obligations outside school, such as car and home maintenance and personal time for leisure and sleep.

However, technology infusion and the implementation of new pedagogic methods take additional time from the instructor. And, since the day has still 24 hours, the introduction of such new activities becomes a "zero-sum game" situation. Failure to recognize and solve this problem is a sure receipt for failure, and induces a host of negative attitudes.

Some overwhelmed instructors, for example, burn out and abandon, in frustration, the new practices, becoming instead walking Ads about the negative effects of technology infusion in the curriculum. Others, end up paying lip service to such new technological developments, carrying them out with no real commitment. Yet others endure these overloads just long

enough to obtain the necessary experience to move on to other positions, where the use of technology is better recognized, supported and rewarded, to the detriment of the home institution who provided the initial training.

In this paper we discuss a fourth, more positive, scenario: the inclusion of Course Management System (CMS) activities and principles to help the educator cope with technology infusion. Under such scenario, faculty development activities still provide instruction on the use of new pedagogical methods and on infusion of technology into their subjects. But, at the same time, faculty is taught new approaches to classroom and course administration, something that changes radically with this new technology and pedagogy and, thus, requires radically different classroom techniques.

This author has developed such combined approaches during many years of teaching development workshops to science and math faculty in Spain, Mexico, Venezuela and Cuba. In affluent countries such as the US, there exist course administration software such as TopClass, WebCT and Angel. But such solution is seldom available in less affluent ones, for this carries very high acquisition, maintenance and training costs.

In the remaining of this paper we overview some issues in CMS implementation, then we overview the material covered in our faculty development workshops and discuss how we integrate them with course management practices. Finally, we overview some general, systemic principles of course administration that we introduce and discuss in our faculty workshops, derived from our practical experiences in these activities.

Course Management (CM) and its Systems (CMS) Software

CM has been defined as the process of developing, managing and delivering information related to a specific course; and CMS as the applications, processes and other required infrastructure designed to facilitate CM (1). In spite of the fact that, nowhere in these definitions it is stated that CM/CMS are restricted to Distance Learning, it is here that it is most widely used. This is perhaps due to the physical separation between teacher and students that make CMS an almost mandatory component of such mode of instruction.

The main features of most CMS software packages (2, 3 and 4) include:

(i) continuous and direct communications facilities between instructor and students (mostly via email/internet),
(ii) electronic delivery of class materials between both, instructor and students (also via email/internet),
(iii) direct communications facilities between students (via email/chat rooms),
(iv) automated student testing, grading and accounting procedures and
(v) software tools for developing curriculum and class materials.

These course administration functions have always existed way before "technology infusion" just like technology existed way before the PC revolution (e.g. the overhead projector, white board and ditto machine were big technological advances in their time). We just have to update them and take advantage of the new technologies and pedagogical methods we

are introducing, for these purposes too.

Acquiring CMS software, however, is expensive. In addition, maintaining it, training the instructors in their use and providing the necessary technical support is an additional burden, both for the institution as well as for those instructors using it (5, 6, 7). And if this poses some difficulties in the First World, the reader may imagine how much more difficult will it be in the Second and Third Worlds. There, some of these licenses cost the equivalent of the annual salary of several full-time faculty and, in addition to these costs, we face serious infrastructure deficiencies.

Consider the problem of the HW/SW infrastructure. The academic computer system may be already heavily taxed with regular administrative functions as well as with basic instruction (programming courses, statistical software, etc.). Operating systems may be incompatible with the modern CMS systems. Computer accessibility, both for faculty and for students, may make the email communication extremely difficult. Scarcity of laptops and modems, unreliable phone connections, electrical shortages, etc. may force faculty to spend an unreasonable time in their work place, in order to develop class material and answer email -since they cannot work from their homes.

Many of these same problems were confronted by this author in his SUNY institution, in the mid 1980s, and still exist in many Third World countries today, severely constraining their use of technology. This author builds on his own solutions to cope with the above problems, when suggesting course management functions in such environments.

In addition, there is the human cost involved in implementing the new methods. And this one is common both to developed as well as to developing countries. We are talking about the training that Instructors need to use the CMS software, which is additional to the training required to implement all other pedagogical innovations. This complicates matters further by placing a dilemma: do we want a communications specialist or an educator that is competent and up-to-date in his or her content matter subject?

In this paper, we argue that CM should be a standard component of any serious effort in technology infusion and innovation of pedagogical methods. This will help avoid the burning-out of the instructor and the corresponding erosion of the improvements introduced. For, since the newly acquired techniques overburden the instructor we should, along with them, provide techniques to compensate for the extra work. This way, we are insuring that faculty really adopt such technology and pedagogical methods.

Workshop Content and Course Management

This author regularly teaches faculty development workshops (8, 9, 10 and 11) on applications of technology and modern pedagogical methods (12 ,13, 14) in statistics, engineering and sciences. He teaches them in small provincial institutions of developing countries, where many of the above-mentioned infrastructure problems are ubiquitous.

Our workshops cover three areas. First, we discuss the use of specialized software (e.g. statistical, such as Minitab; simulation, such as GPSS) in

the teaching of statistics, operations research, management and business courses -but also in sciences in general such as physics, chemistry and biology. Secondly, we discuss modern pedagogical methods that allow the instructor to develop a student-centered teaching approach, using techniques such as group learning, team projects and contextual work.

These new methods, however, are difficult to implement using old class management tools. So our third workshop element consists of course administration techniques. And, since we do not want to teach CMS systems that these institutions will not be able to afford (it is difficult enough for them to acquire Minitab or GPSS licenses) we work with the tools they have. These are, in most cases, the standard Microsoft Office package tools (Word, Excel, PowerPoint, Outlook, Explorer). We show how to substitute with them the above mentioned CMS course management functions, taking advantage of the same pedagogic techniques we are introducing.

We base our workshops in the following principles: (i) back to basics (using Microsoft Office), (ii) design/plan ahead, (iii) reuse, (iv) reduce (overhead), (v) multiply the use (cooperative and team work among faculty), (vi) integrate your work, whenever possible and (vii) reward (your faculty). We implement such principles in the following way:

1. An often forgotten but basic skill is typing. Tools with which to build most of our classroom material can be found in today's ubiquitous Microsoft Office, which has become a standard in any PC. But their use require intensive typing. A good typist can answer several emails per minute, or write a lengthy technical explanation in a Word doc file and post it in a Web Page. A good typist can prepare a PowerPoint presentation or a class grade book faster than by hand. If the faculty is not up to speed in these skills, we begin by strongly suggesting they dedicate a serious effort to master them, and exhort the institution to support this effort.

2. Ad-hoc work is a sure recipe for both, extra work and poor results. In our workshops we stress planning and design of all curriculum activities, but with a systemic approach. Start by stating the course objectives and how you plan to achieve them. Then take a look at the textbook and the course length and design accordingly. Prioritize and keep it simple (do not overburden the students or the curriculum). Then, think about how does one's course integrate with all the others in the general curriculum. Are there overlaps that can be eliminated? Are there voids that need to be filled? Then design each class (top-down approach). Use a computer to develop as much (if not all) class and curriculum materials and do so in short, complete, stand-alone modules. Organize your module files in a hierarchical library and keep a good index of the material developed.

3. Reuse as much material as you can, by developing them modularly. This is why you use a computer, files and integrated software instead of hand notes. For example, prepare a statistics module on confidence intervals that contains the explanation, a numerical example and a (solved) exercise for the students. We can then use this material in many courses: in general statistics, in regression or design of experiments, business, in psychology or biology, etc.). Create a library with your files.

4. Reduce your overhead whenever possible. If you find that three students ask the same question, write a file with the answer and an example and send/post it for all the class. This is why you use email and Internet.

Create a FAQ file with the student questions and your answers and send it out or post it before each class (and avoid 50% of your office hour questions). Delegate: interact with the group leaders and let these, interact with their group members. This is an advantage of using group learning techniques.

5. Latin American faculty is gregarious and sharing. A library of materials, for the entire department, can be created and shared, operating in the same manner as a cooperative or credit union. Any faculty that contributes some material acquires the right to use the other existing library material. This approach reduces much overhead and duplication, creates healthy faculty interaction and fosters team-teaching

6. Integrate your work; always take a system approach. When using group learning, for example, trade breadth by depth. Instead of repeating five times the same thing, tell it once to a group of five and do so more extensively. Have groups work on different but related topics and then have them present their material in class. Students love it, and will love you, too. Combine Excel-PowerPoint-Word-Outlook-Explorer in an integrated fashion. If you are using specialized software such as Minitab, collect your examples in a LIS file and post or email them with your comments and graphs. Pass down secondary class activities in form of Macros that students can execute. This helps them keep one difficulty at a time and to zero-in into the specific class topic.

7. Reward your faculty. This I state in my very first workshop session, which is always attended by the institution's Dean or Provost. It does not always mean to raise salaries -which is also OK. A faster computer, needed software, student grader or TA, lighter load, a public recognition in the form of a diploma, public mention, etc. can do wonders to raise faculty morale and work spirit -in the same way that lack thereof can destroy it. This Hispanic author suffered such lack of recognition and reward, first hand, and has observed its result in other colleagues. It lead us to take early retirement and others, to leave the institution or give up in frustration.

It becomes evident that, by implementing the above mentioned seven principles (whatever the specific material our workshop is covering) we will also be implementing the mentioned five main functions of a CMS. Only, now with our own tools:

(i) Communications instructor-students (via email/internet): the most important factor in class delivery, is reinforced by email, internet, bulletin board, phone, fax, mail, etc., according to existing possibilities (possibly a good mix). The medium is not as relevant as is having actual, active, open communication at all times.
(ii) Electronic delivery of materials between instructor and students: even when few terminals are available and email/internet exchanges are reduced, this bottleneck can be alleviated via working in teams. Communicate to-from students via the group leader and considerably reduce traffic volume. This practice also enhances cooperation among students. The professional of the XXI Century will interact intensively and work in teams, and this is an excellent training for it.
(iii) Communications between students (via email/chat rooms): enhancing group and student interaction is a goal in itself. If email is not available due to technological constraints, achieve interaction via phone, fax, public access files, etc. Organize student work by groups and reward

them for it. We all like to be recognized for our good work. Teamwork, under our approach, only gives the students the right to take the individual exams, which yield over 50% of their final grade. Students soon verify that lazy group members will not get the same final grade as hard-working ones. In addition, groups function autonomously and democratically. So groups can expel those students that are either disruptive or do no want to work.
(iv) Automatic student grading and accounting procedures: use Excel spreadsheets and other grading software. Give short tests often; use computer-graded or multiple parts and multiple choice. Prepare word process files and combine questions from past tests. Also, include team presentations, projects and other in-depth collective work in your grading scheme and use it to extend learning. Ask questions to different group members, during their class presentations; this uncovers who did the work and encourages participation. Survive grading!
(v) Curriculum and class materials developing tools: combine all Microsoft Office software to create appealing and reusable modules of class preparations, labs, tests, etc. Share them with other faculty that share with you. If you don't have Microsoft, find out what equivalent software your operating system supports, learn it and use it in the same way explained above. Be resourceful.

We have taught many workshops in Spain and Latin America, using the above-mentioned principles. We have done so both, in small, provincial and poorly endowed institutions and in internationally recognized ones, with computer facilities comparable to those of their American counterparts. We have even taught to entire university systems, though their distance learning facilities. We have always found eager, interested and receptive faculty that has later implemented these educational principles in their classrooms. Several of these experiences have then been assessed (15, 16) and found to work well.

Summary and Conclusions

The faculty development experiences discussed in the present paper have been successful in more than one way. Firstly, the Juarez Lincoln Marti International Education Project, through which this writer teaches most of his workshops abroad, has more demands for faculty development courses than it can currently meet.

In the recent past, we have obtained a Speaker Specialist Grant from the Department of State, to teach such workshops in Mexico. From this experience, we have devised an ingenious work plan, by which we go abroad to teach a long workshop in an endowed institution that can transport us. And once there, we teach a second, shorter course in a smaller, less endowed institution on a much lower overhead. With this approach we have been able to serve several additional provincial universities and to train dozens of their faculty in the new technologies and methodologies mentioned above, with good results.

Finally, we teach such workshops in the vernacular language (Spanish) at a very low cost for the receiving institution, since we are a service-oriented and not a for-profit Project. After the workshop, we create a follow-up link that can take one of several forms. We may create an email list and periodically communicate with the faculty through the workshops leaders (counterparts that worked with us as class assistants and remain as team leaders and communications interfaces). Or, at

better-endowed institutions, an Internet Forum can be set up, where faculty can directly communicate with us, tell us about their progress and problems and keep up with any further development.

That the Juarez-Lincoln-Marti Project continues teaching such course administration faculty development workshops and has a growing following is not only our greatest reward and pride, but the best assessment of the success of the methods employed.

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