A Learner-centered Approach to Mass Education

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ABSTRACT

The one-to-one Socratic dialogue or master-apprentice approach to learning is considered by many as ideal because of the built-in mechanism of immediate feedback and reinforcement. Others believe that cooperative learning or peer instruction is equally effective. In mass education, there are also the issues of cost per student and the predisposition of students to learn. Many use cost considerations to justify continuing the teacher-centered one-to-many "chalk and talk" approach. But a learner-centered approach is more desirable, and we describe here a cost effective way of adopting it using currently available technologies.

I. WHAT IS THE ISSUE? – WE COULD DO BETTER

It is a tenet among educators everywhere that the class size should be kept as small as practicable. This may simply reflect the desire to approach the ideal of a one-to-one Socratic dialogue or master-apprentice approach to learning that has immediate feedback and reinforcement (IFR) built-in. The advantage of a small class size is unmistakable. In any community, the best educational institutions generally have the smallest ratios of students-to-faculty.

In a class environment, there is the added possibility of cooperative learning that is synonymous to peer instruction (PI). This sort of interaction is much more evident outside of the classroom and in the playground where sporting games are played. Not only do students help each other get familiar with the rules of the game, the knowledgeable players also instruct others on techniques and strategies. Surely such PIs should work equally well inside the classroom in effecting a positive outcome on learning academic subjects.

There is also the general consideration of what topics are more amenable to subject-based learning (SBL) and what are to problem-based learning (PBL). SBL is the traditional approach of focusing on all aspects of a given subject, like English or algebra for example. PBL is any learning environment in which the problem drives the learning. In other words, the problem is posed so that the students discover they need to acquire some new knowledge before they can solve the problem. In this sense

research is PBL. It should be noted that both IFR and PI could be incorporated into either SBL or PBL.

It is not uncommon that those students who continue to post-secondary levels are there because they previously have been influenced or motivated or inspired by someone like a parent, a teacher, or an idol. However, such a life-altering event does not preclude the need for inspiration to undertake the day-to-day learning activities. These small inspirations usually cannot be scheduled. But making the learning materials available ahead of class meeting, for access anytime, anywhere, helps when a learning inspiration occurs.

Still the most common practice in many higher education institutions of today is the one-to-many, "chalk and talk" teaching-centered approach (TCA) that, on the one hand, is relatively cost efficient and, on the other, encourages passive learning. With the technologies currently available, the benefits of a learner-centered approach (LCA) discussed above can be realized in mass education with only incremental additions in costs. However, experience tells us that institutionalizing an LCA would be extremely difficult unless one starts from scratch with a new organization. Thus, for concreteness, the essential elements comprising an LCA are discussed below in the context of establishing a new post-secondary community college.

II. HOW COULD THE ISSUE BE RESOLVED? – USE A LEARNER-CENTERED APPROACH

A learner-centered community college would, in my view, have at least four action components. These are:

1. Download all previous and new course materials, preferably interactive and multi-media types, on the web for anytime-anywhere access by students before any face-to-face class meeting. This arrangement helps students take advantage of a learning inspiration when it occurs and prepares them for active learning in the classroom.

2. Replace passive learning lectures by active learning activities with IFR in all regular face-to-face class sessions [2]. An example of active learning is to conduct Socratic dialogues by asking timely, concept-clarifying, or thought-provoking questions and requiring each and every student to answer them [3]. PI can be incorporated by repeating any question for which a majority did not get the correct answer; except that, the second time around, students are encouraged to discuss with their peers and try convincing each other before answering again. These types of IFR and PI can be implemented for any class size by using an electronic student response system like the PRS that was developed at and patented by HKUST [1, 4].

3. Monitor continuously the activities and progress of each student so that any needed support can be provided in a timely fashion and academic quality assurance can be applied uniformly across the various programs. A web-based

learning management system (LMS) that includes course management functions can be used to facilitate this task.

4. Incorporate group projects, where appropriate and resources permit, that highlight one or a combination of the following:

    - The joy of learning,
    - The thrill of discovery,
    - The fun of sharing,
    - The reward of caring.

Compared to a traditional TCA college, there may even be cost savings with an LCA college while delivering better education quality. A web-based LMS requires much fewer staff to provide such support functions as admission, registration, and record keeping. The enrolment of popular courses can be easily scaled up because the same media-rich instructional materials can be used for the new sections and the additional tutors can be trained and supervised by the same "master teacher". These section tutors could be PhD students. For an affiliated research university, such an arrangement would be a supplemental source of postgraduate stipends particularly welcomed by those in the social sciences and humanities.

There are believers and practitioners of LCA in many existing institutions of higher education but there are many more champions of TCA. Thus, the institutionalization of LCA will be more likely to succeed if one starts with a new organization rather than reorganizing an established one, since LCA is a paradigm shift of nearly 180^{o} from TCA.

III. WOULD THE STUDENTS AGREE? - DO A SURVEY AND FIND OUT

A final verdict on the effectiveness of any educational approach ultimately rests on the completion rate of students in the program and on how successful the graduates are in their careers. Until then, the best one could do is to make sure that the underlying principles and plans are reasonably sound. I believe that few in the teaching profession would dispute the soundness of the LCA outlined in the previous section. Nevertheless it is useful to get the views of the supposed beneficiaries. Since there are as yet no LCA colleges, we will have to make do with students at HKUST. A survey was conducted using the PRS in the UG Forum of the Physics Department held on 2 November 2001.

The survey can be considered unbiased in the sense that the students were not told ahead of time the nature of the survey nor the questions asked. On the other hand, a) the students are Physics majors and may not be representative of the student body at-large; b) they are year-1 to year-3 university students and may not be typical of community college students; and c) the sample size is only ~140. With these caveats, the survey and results are described below.

Students were asked to respond in five categories from “Disagree Strongly” to “Agree Strongly” to the following three statements:

S1 - I am more inclined to do my assignments before class meets if all course materials (previous and current) are accessible anytime, anywhere through the Internet.

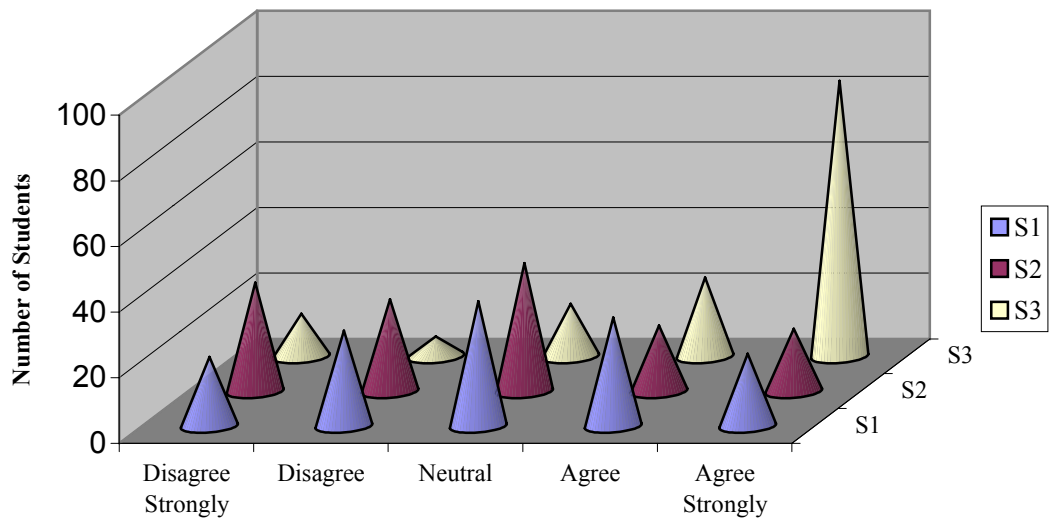
S2 - In the classroom, I prefer the traditional lecture format to an interactive approach where short presentations are interspersed with concept questions requiring all to answer.

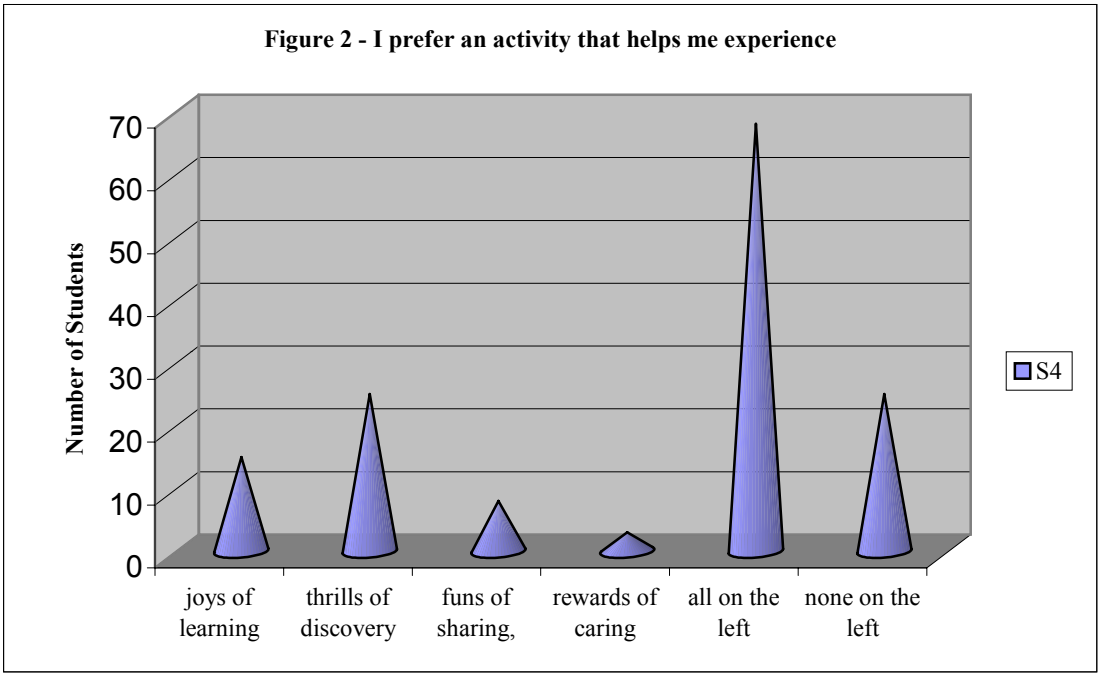
S3 - I appreciate being reminded by e-mail ahead of time about any assignment that is due.

Their responses are summarized in Figure 1.

The mean response to the statement S1 suggests a stand of neutral to slight agreement. This provides some support for item II-1 above. A disagreement with the statement S2 is indicated on average; implying that the students prefer interactive engagement over pure lecture in face-to-face class meetings and, thus, supports item II-2. The statement S3 is favored overwhelmingly and this meshes well with item II-3. Also, a strong backing for item II-4 above is evident from the responses to the statement S4 shown in Figure 2 below.

Figure 1





IV. IS CARING ENOUGH THE REAL KEY? - ALL SIGNS SEEM TO POINT TO THE AFFIRMATIVE

At HKUST, good teaching has been encouraged and emphasized since its beginning by annually a) conducting course evaluations by students and publicizing the results, and b) honoring the good teachers with awards—the prestigious Michael Gale Gold Medal, the Top 10 Lecturers of the Year, and the various Teaching Awards in the schools and in the departments. Upon detailed examination, the one distinguishing attribute that seems to be common to every one of the award recipients is that they ***care enough*** for their students to have taken this extra step or adopted that new approach to making learning easier, more fun, and/or more effective for their students. I submit that this same attribute of ***caring enough*** characterizes the teachers that we remember as having profoundly impacted our lives for better because it builds self-confidence, it encourages one to do one's best, and it consoles one in bad times.

Here, I have tried to make a case for using available technologies to institutionalize good learner-centered practices in mass education. In retrospect, it may simply be a proposal to institutionalize the attribute of ***caring enough***. Put in another way, the use of media-rich educational technologies is simply a way of relieving the teacher of the chore of delivering content so that the teacher is freed to concentrate on the learning of each and every student. An ancient proverb of the famous philosopher Lao Tzu states:

Give a man a fish and you feed him for a day.
Teach him how to fish and you feed him for a lifetime.

For modern times, he might have added:

Train him to farm fish and you feed his family for generations.
Educate him to clone fish and you feed his community forever.

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