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**College of Career Education**

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***on***

***Teaching Effectiveness***

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## Introduction

The faculty of the Extended Campus of Embry Riddle Aeronautical University are proud to present these papers from the Fourth Annual Symposium on Teaching Effectiveness.

This annual symposium is conducted to encourage sharing of information and to stimulate interest in research concerning teaching more effectively.

Papers are solicited from faculty of the Extended Campus, the University's residential campuses at Daytona Beach, Florida and Prescott, Arizona and other interested parties from the education professions. Those presented herein are selected by a juried process, utilizing a blind review.

The rapid development of technology useful in the delivery of learning experiences makes it incumbent upon the conscientious faculty member to seek knowledge of, explore, and experiment with the constantly changing tools of instruction, incorporating those that enhance the learning experience and discarding or modifying those that do not, separating the "gee whiz" from the truly effective. It is also incumbent upon those who are truly professional in the field of teaching to share their findings with others. It is with that sharing that we present these papers

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***TECHNOLOGICAL ADVANCES IN THE ART AND SCIENCE OF TEACHING***  
***Can Improved Teaching Effectiveness Keep American Professors Competitive***

by

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**ABSTRACT**

**TECHNOLOGICAL ADVANCES IN THE ART AND SCIENCE OF TEACHING:**

**Can Improved Teaching Effectiveness Keep American Professors Competitive?**

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Melvin J Anderson, Ph.D.

September, 1996

This paper examines the impact of technological advances on American higher education in the coming decade. It is not, however, an encouraging pep talk about how fancier audiovisual aids and classroom video projectors can dress up lectures and impress students. It's too late for that.

The paper begins with a discussion about a very disturbing article from *Financial Times*, which claims that American professors in conventional universities are outdated; that they are selling a product that is ridiculously expensive and ill-suited to the needs of the changing society. The article cites a book by Lewis Perelman, *School's Out*, in which the author predicts the demise of conventional education.

According to Perelman, modern electronic technology--interactive software and multimedia technology--will replace conventional degree programs, permitting the student to begin his professional life earlier, wait until particular knowledge or skills are needed, and then obtain them electronically. This switch to "just-in-time" learning would mean that talented people would no longer spend years preparing for employment. They would begin work early--perhaps in their mid-teens--but continue learning on the just-in-time principle. In such a world "going to college" would cease to be part of the American dream. "Electronic college" would replace present-day heavily-subsidized non-profit institutions, a true market would develop, and electronic education would become a highly profitable business for the so-called "learning companies." As Perelman sees it, technological advances will not prove to be academia's new teaching tools, but their downfall.

The paper examines Perelman's assertions as social issues, and then in terms of learning requirements for the society. Next, it relates these to the ongoing internal issues in higher education, citing the causes for the price, product and responsiveness problems that currently plague American colleges. By introducing a systematic thinking process to analyze the problems inherent in academia, the paper shows how any college or university can identify the policy constraints that constitute the core problems affecting its viability in a changing, high-tech educational environment.

Rejecting Perelman's predictions, the paper explains a balanced solution that takes advantage of the enormous resources already available in the American university. This solution not only exploits the supply-side advantage that conventional colleges possess; it permits a logical approach to the use of technological advances that will enhance the effectiveness of academia's still-viable organizations. By exploiting its weak links and resolving its policy constraints, a college can avoid compromises and develop balanced solutions that bring local (departmental) objectives into focus with the global goal of the institution.

The paper ends with a restatement of the importance of the conventional college in the overall American learning experience. It restates the value of the traditional classroom as the only environment in which a teacher can apply Socratic teaching techniques, come face-to-face with the student and create a relationship which technological advances can deeply enhance.

Melvin J Anderson, Ph.D.

**TECHNOLOGICAL ADVANCES IN THE ART AND SCIENCE OF  
TEACHING: Can Improved Teaching Effectiveness Keep American  
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**HEADLINE:** *Financial Times*, November 20, 1995, (Michael Prowse--America):

## Endangered Species

**Modern electronic technology could mean that the days of  
academics at higher-education institutions are numbered.**

Does the future of the American professor look as bleak as some "experts" claim? Is s/he destined to be replaced by computers, online services, interactive software and multimedia technology because s/he cannot deliver current information effectively or competitively?

This paper assesses the potential reality of a recent article's gloomy prediction about the future of higher education as we know it. Through the use of an innovative logical thinking process often used to analyze business problems, the paper attempts to identify the core problems underlying the undesirable outcomes the article portends. In so doing, the article suggests that teaching effectiveness is much more than just tools and technique; it is a function of the entire system of higher education.

### A DIM VIEW OF THE FUTURE

According to Lewis Perelman, president of the Kanbrain Institute and author of *School's*

*Out*, conventional education is on its way out. (His firm's name, "Kanbrain," is adapted from *kanban*, the Japanese word for the "just-in-time" production inventory system.) Perelman asserts that present-day electronic teaching techniques will make traditional college learning obsolete. The "old approach," as Perelman calls it, was to start life by trying to accumulate a large stockpile of knowledge through the formal channels of academe, never sure that what we have learned will be relevant in the rapidly-changing real world of work. "Going to college," as it has persisted since the time of Socrates, with lecturers standing in the front of spacious classrooms, should be replaced by more economic, more timely and relevant offerings via one's home computer or television screen--at a small fraction of the cost of traditional classroom courses. Or so it seems to Mr. Perelman.

Is a better strategy, then, to wait until one needs specific knowledge or skills and then obtain them electronically? Can "just-in-time learning" free talented people from

years of preparation for employment and permit them to begin work earlier, possibly in their mid-teens, and then continue learning as needs arise--just in time? Are the price, currency and quality differences going to eliminate the "halls of ivy" we have come to respect?

Perelman observes with some accuracy that compared to other information-based industries, academia is increasingly unable to offer competitively-priced products. While prices for software and hardware continue to fall, higher education offers no relief from a trend that is, I fearfully observe, showing no signs of improvement. The price of college tuition has been on a ten-year rampage--an increase of 174 percent--since 1985. In just the past five years, borrowing to pay for college has doubled, to the tune of about \$25 billion per year. At the same time, nontraditional education systems have shown a tremendous growth; customers (students, if you prefer) are finding that state-of-the art knowledge in many disciplines is more economically available through nonaccredited sources such as video tape training programs, online publishing and in-house management courses given by very credible providers. According to Perelman's view, technology will inevitably win out over tradition.

If technological advances are all that matter, then the competitive race between traditional academia and the electronic classroom is merely a question of who has the most toys. The one, it is said, who dies with the most toys--wins. But he also dies.

Teaching effectiveness, therefore, requires more than technological enhancements to the art and science of teaching. There are inherently three levels of issues affecting this

question:

1. **Social issues** which determine the knowledge requirements of the society,
2. **Requirements issues** which determine the nature of the delivery system that provides that knowledge, and
3. **Internal issues** within the delivery system which determine how it operates and delivers the knowledge required.

### **SOCIAL ISSUES CANNOT BE IGNORED**

Aside from the academic issues raised by Mr. Perelman, there are some serious social implications associated with his prediction that more young people will postpone higher education and go directly to work after high school. First and foremost, are teenagers ready for earlier-on career initiation? Do they have the maturity to buckle down and become productive employees at the age of, say, eighteen or twenty? Will anyone want to employ them?

A second social issue likely to be induced by a flood of young people streaming out of high schools looking for work is the stream of young people streaming out of high schools looking for work--with no education whatsoever. Maturity and marketable skills issues notwithstanding, these folks may present society with an entire new set of welfare, health care and transportation problems. Perhaps a few would become taxpayers a few years sooner, but it's questionable whether the average "early starter" will move up the pay ladder and ever catch up with the alter ego that would

have attended college and started at a higher salary.

Perelman raises yet another social issue, one that has even more serious implications for higher education. What if the job market adjusts to such an influx of uneducated persons only to the extent that a select few are eventually sent to college, formal or electronic? On the other hand, how many of them will be willing to make the effort, spend the money and take the time to go to school after a few years of work and a few new personal commitments (a spouse, two children and a car payment)? What affect will this have on the society as a whole, not to mention the education of it?

There is also the macro-social question: will higher education--in whatever form it takes in the future--provide for the needs of its students as parts of the total society? Amid the growing popularity of interactive software and multimedia technology, can higher education insure that its product is indeed offering an entire nation of customers unique products they really need, at a price they believe it is worth? Perelman thinks not.

At the same time, will higher learning continue to be recognized for what it uniquely is: **higher** learning? Will it still provide knowledge and thinking skills that cannot be acquired easily in work environments or via the picture tube. Are academics at risk of being perceived as "professaurs" trying to preserve a buggy-whip industry merely for the sake of our own jobs and egos? Or is it safe to assume that certain aspects of traditional college learning will never be replaced by

nonthinking machines, and that for these educational products there will always be a demand?

With or without Mr. Perelman's assertions, we must be concerned about what higher education is and ought to be. We're wise enough to check our assumptions occasionally and confident enough in our own abilities, so let's get back to the issue raised by Mr. Perelman: can everything now offered in traditional college programs be replaced effectively by electronic learning, just in time for its application in the workplace?

To compete effectively with the "electronic educator" of tomorrow, formal higher education must satisfy the knowledge requirements of the society. Perelman suggests that we have already failed and that replacement is inevitable. This is what society will choose in the marketplace; ours is a demand-driven system like any business, and the customer is the final decision maker. By invoking the valid example of supply and demand, Perelman concludes that academia has no control of the market forces acting upon it; to survive means meeting the demand. What he has overlooked is that while demand fuels the engine of supply in any industry, the engine is not built in one day (or one semester).

The problem for higher education is delivering the requirements demanded; this is a three-dimensional problem involving three interrelated issues--the same three issues that every business faces.

**THREE PARTS OF THE PROBLEM:  
THREE REQUIREMENTS ISSUES**

If academia is unable to answer the demand issues with actual performance, then Lewis Perelman will be proven right and all that he predicts will come true. The issues for the business of higher education are exactly the same three issues that affect every business: **Product, price and responsiveness** in the market.

The **price issue** is already well-known. If academia is unable to level its price curve while other information-based industries continue to offer lower and lower prices for more attractive products, then our customers are sooner or later going to rethink their personal and organizational needs for knowledge and seek alternatives to the traditional campus. These economic issues cannot be ignored.

The **product issues** are equally well-known. This is the era of "quality everything." If academia as we know it does not compete on the basis of product quality, then no matter the price, our customers will even sooner than later seek other sources or simply postpone learning until they find what they want. The quality of educational products delivered to the student is measured in dimensions that add up to student satisfaction. That quality measurement is deeply affected by the students' perceptions of curricula, teaching skills, availability of courses and relevance to need. Higher education is no less demand-driven and customer-controlled than any other industry.

The third issue--**responsiveness** (timeliness) of knowledge delivered--cannot be ignored. In fact, this may be the problem higher

education is most unwilling to solve. Educational timeliness is measured in two dimensions--currency of knowledge and delivery when the customer wants it. On the surface this sounds like a simple task, until we consider the fact that the content of many college curricula relies heavily on the content of available textbooks and the theories, processes and applications therein. The American college textbook system encourages little change from edition to edition, even in books whose disciplines address real-world competitive markets in which obsolescence means death. One wonders why textbooks in dynamic disciplines such as production operations, marketing and accounting read more like history books than state-of-the-art knowledge. One wonders why schools that tout "state-of-the-art" computer applications still adhere to publication style manuals designed for manual typewriters, in which the only updates address recent politically correct language issues.

We already know that mainstream textbook publishers are unwilling to invest in paper and ink for textbooks that have received "thumbs down" by the professors who review manuscripts; a bad review means the proposed text will not be adopted and therefore not sold. If the good-old-boy professors at prestigious institutions don't want the textbooks to change, then neither do the publishers. New editions that survive this process are too often nothing more than redated and reargoned reiterations of the same old "tried and true" material. "Tried" material is comfortable for them; "true" is not important, or worse, threatening to them when it means that "tried" is obsolete.

### **Good Cause for His Predictions**

Perelman touches on all three issues in his assertion that employers are more and more interested in what an employee or prospective employee can do for the firm and less and less interested in what degree s/he has obtained some years ago. Business is business, now and always. (Perelman didn't invent this concept.) Regardless of how and where a firm's employees are educated, the cost of getting them educated involves a business decision; the cost must be justified by benefits. The sequence of logical connections in this matter is quite simple:

- . **If** designers and managers have state-of-the-art skills and knowledge, **then** their firms can produce and deliver more competitive products to the market.
- . **If** these firms deliver more competitive products to the market, **then** the firms earn higher revenues.
- . Finally, **if** these firms earn higher revenues, **then** they are able to remain in business, reward their employees, and return an attractive profit to their investors.

Modern electronic technology, according to Perelman, has already made "just-in-time learning" eminently feasible. The "electronic college," as he sees it, would consist of courses supplied by cost-effective "learning companies" competing for business in a true market, while highly-subsidized,

inefficient nonprofit institutions would probably decline dramatically. His conclusion is that traditional academia will be unable to compete in this market and will therefore be replaced by computers, online services, interactive software and multimedia technology.

### **Is He Correct?**

Perelman is intuitively correct about one thing: the **requirements** issues--product, price and responsiveness--with their implications for higher education--must inevitably be addressed as **internal** issues for higher education.

We must assess Perelman's assertions **inside** higher education--where what we do happens--and examine them first as internal issues, and then as competitive issues in the marketplace. Perelman does not discuss the internal problems of academia, only the perceived effects. Academia has created internally its own external problems, but we must remember that these problems are borne out of internal issues which are capable of being addressed and solved internally. Here is the key to the solution, if we are able to examine these internal issues systematically (using cause-and-effect logical analysis) to find and fix the core problems that have led us to the external issues Perelman describes.

### **THE INTERNAL ISSUES: DEMAND, THROUGHPUT AND DELIVERY**

Private colleges and universities still have a fairly intact reputation for offering marketable skills and certificates despite

higher tuition rates than government-owned schools. Regardless of circumstances, there exists a very clear perception that private schools are better because they generally offer smaller classes and more tailored, state-of-the-art programs. If this perception dims for whatever reason, then these schools will experience disastrous declines in enrollment (and tuition). Moreover, the overall thrust of Perelman's assertions casts an equally-dark shadow on government-owned institutions, although these public-funded schools could survive longer since their expenses are not as immediately dependent on tuition revenues.

### **The First Internal Issue: Demand**

Why are so many colleges currently having increasing difficulty trying to keep enrollments up? It's possible that what these schools perceive as problems are only the **undesirable effects** of things more deeply rooted in the academic culture--policies that do not lend themselves to quantification or even direct identification. Perhaps these policies can be identified.

When viewed from the customer-demand side of the problem, the external issues Perelman cites concerning product, price and responsiveness are entirely valid. Higher education is indeed facing severe competition from the electronic classroom of the future. Colleges might improve their internal conditions, but most market factors are functions of what the competition offers and the demand for it. We can safely assume that if higher education is going to avoid the outcomes Perelman predicts, then it will have to come up with **internal** solutions to the **internal** problems that prevent us from competing in the demand-

driven competitive marketplace.

The above assumption forms a key point of this paper.

College people aren't stupid or ignorant; we are very capable of logical thinking. But it is entirely possible that some of us haven't thought recently about colleges as systems. We've been operating comfortably in our local departments and schools, classes and courses, disciplines and programs. We have **not** been sufficiently concerned about the demand for what we offer. Moreover, we apparently don't know how to analyze the system we are all parts of, especially when it is in trouble.

I'd like to introduce a logical analysis technique many businesses use to identify and correct root causes for their problems--a technique generically known as the systems Thinking Process (TP). If it works for business, it can work for higher education. (Several good books describing the use of the systems Thinking Process for business decisions are available, including Dr. Eliyahu M. Goldratt's latest, *It's Not Luck* (North River Press, 1994), and H. William Dettmer's *The Theory of Constraints* (ASQC Press, 1996).

First, let's identify some of the internal issues of higher education that are related to the changing demand for higher learning. Numerous "**UnDesirable Effects**" (Let's call them **UDEs**) come to mind, even if we cannot identify their causes right away. Several UDEs are clearly suggested by Perelman's assertions:

UDE No. 1: Colleges do not accurately measure the demand for courses.

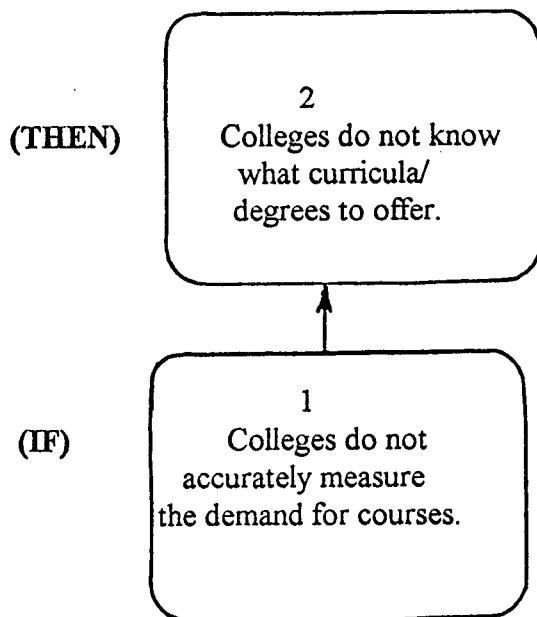
UDE No. 2: Colleges do not know what curricula/degrees to offer.

UDE No. 3: Colleges devise ineffective product-price-responsiveness strategies.

UDE No. 4: Colleges offer many courses for which there is declining demand.

UDE No. 5: Colleges do not offer many courses for which there is growing demand.

There are undoubtedly more UDEs as well as positive entities within higher education, but let's see how these five relate. Suppose we identify a causal relationships between two related UDEs, place them in boxes and add an arrow to show the cause-and-effect relationship:

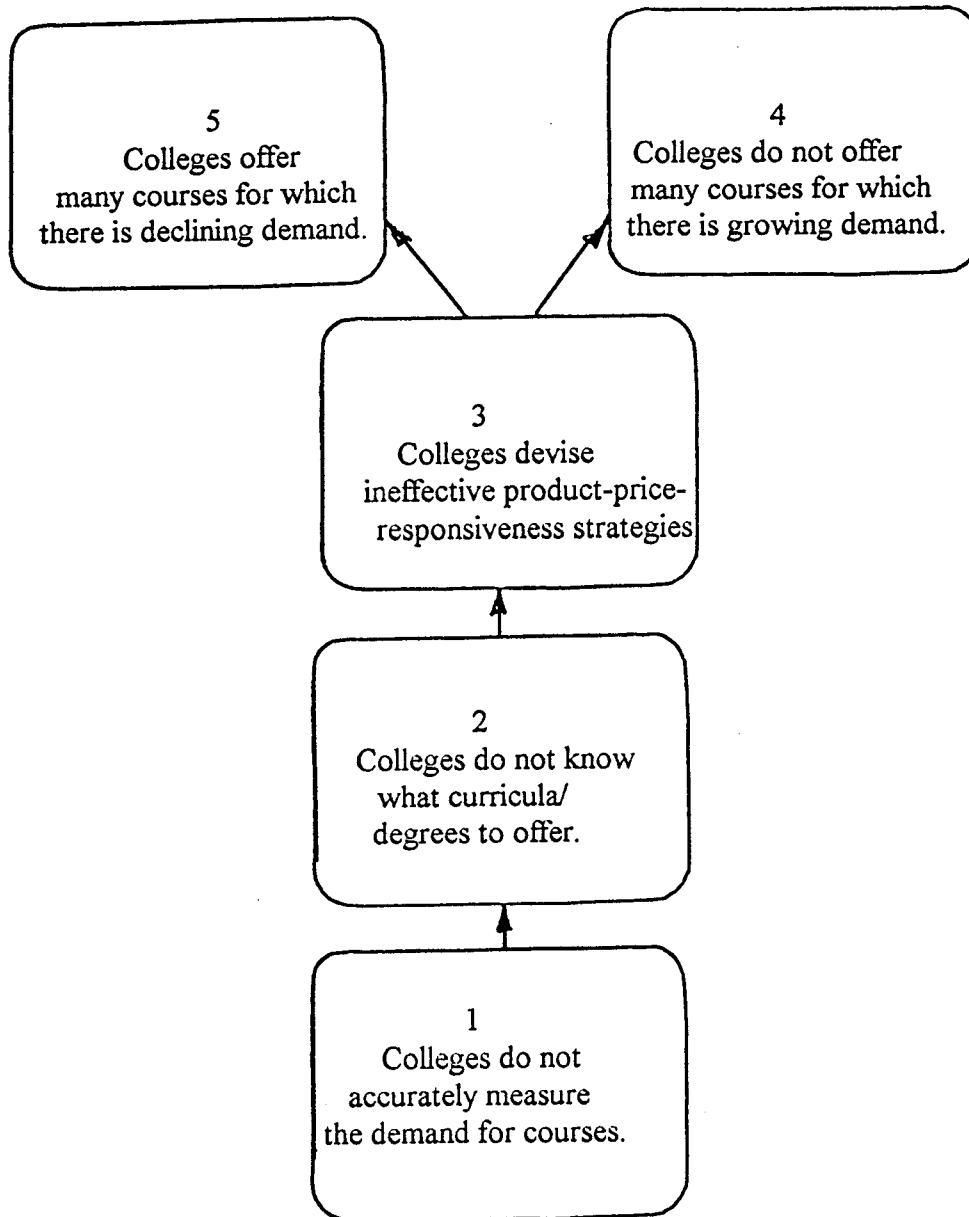


This logic diagram is read from the bottom up as:

**"IF:** Colleges do not accurately measure the demand for courses . . .

**THEN:** Colleges do not know what curricula/degrees to offer."

That was easy; it makes sense. But we don't really need a diagram to understand or communicate a relationship between only two entities. With or without the diagram, one can easily understand the causality in this statement. It is also possible that the other UDEs have causal connections with the first two:



The logical conclusion established in any one relationship extends upward to all the relationships above it. If colleges do not accurately measure the demand for courses, then all the other entities above it in the diagram exist as well. A classic Greek syllogism is formed when three or more entities are linked together.

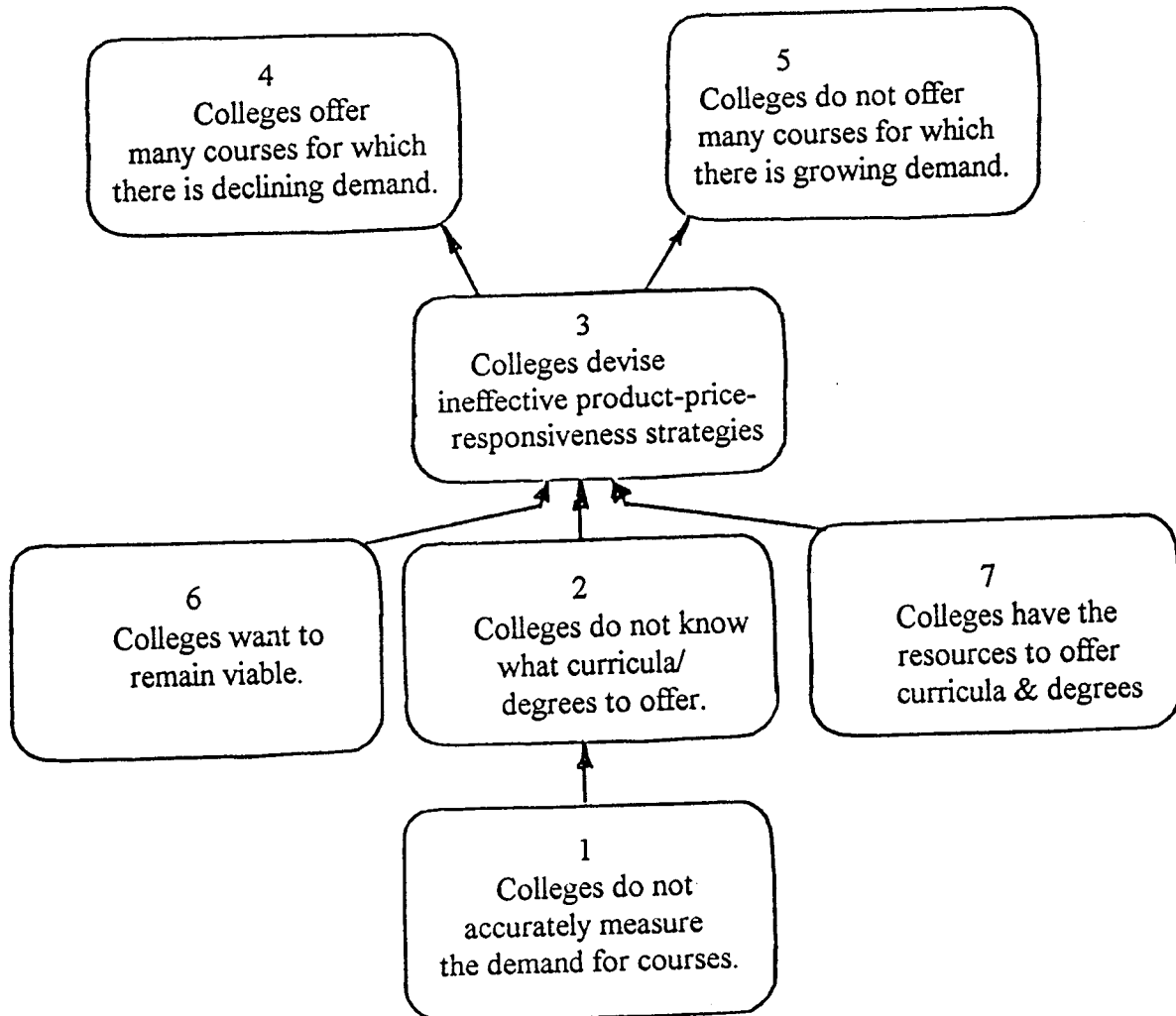
As the number of entities increases, the ability of mere mortals to interpret the many causal connections becomes very difficult. For five entities, there can be as many as 120 different causal relationships ( $5 \times 4 \times 3 \times 2 \times 1$ )! It's like trying to understand a computer program by reading all the lines of code every time we want to know what it does. The above “**current reality tree**” not only contains the UDEs and other entities we’ve identified; it also shows the causal connections linking them in a way that mere prose cannot describe.

Obviously, there are many other causes and effects than the four we’ve shown here. For example, we know that:

[6] Colleges want to remain viable.

[7] Colleges have the resources to offer desired curricula and degrees.

These can easily be added to the **current reality tree**:



The **core problem** in this analysis is still entity [1]: Colleges do not accurately measure the demand for courses. Real improvement can only occur if something better replaces it. No amount of "attacking the UDEs" (band-aid management) of higher education can solve the myriad of problems.

The demand issue clearly revolves around whether colleges accurately measure the demand for courses. Do we really know what students of the future will need from higher education that they cannot get from the electronic classroom, just-in-time? If we don't, then Perelman's predictions will come true.

Any process of ongoing improvement requires change; all improvement is change (Not all change is improvement, sadly). And all change begins with a decision about **what to change**. For any real improvement, change must address the degree and manner in which higher education measures the demand for courses in the future.

If **what to change** (the core problem) is the fact that "colleges do not accurately measure demand for courses," then **to what to change** should logically be the opposite of that core problem: "colleges accurately measure demand for courses." That's common sense, but it isn't that easy! If we could make this an objective for change, we would quickly discover that in order to actually achieve accurate measurement of demand for courses, several requirements and prerequisites would have to be identified. Also, the conflicts between them would have to be resolved by exposing any flawed assumptions about what is needed. Fortunately, the Thinking Process also

contains a logical technique for resolving conflict and dealing with flawed assumptions.

### **The second internal issue: throughput**

The economics of higher education always count. Higher education is a service industry, mostly a fixed-cost operation. Marginal cost for one more student is near zero. But when one less student enrolls, marginal revenue drops--even in a public college. The total cost must be applied to the remaining students by raising their tuition. Add to this the combined dilemmas of the last of the baby boomers past college age and a serious decline in the quality of primary and secondary public education (both affecting the number of qualified college enrollees), and we have something that challenges traditional cost accountants: how to allocate increasing "fixed" costs to decreasing sales volumes? In other words, as teaching salaries and other operating expenses go up while enrollments go down, how can schools keep tuition rates from increasing? The challenge cannot be met by lowering admission standards and graduation requirements; the schools attempting that are already facing credibility crises. The challenge cannot be met by raising tuition much more; the schools attempting that are now facing affordability crises.

Colleges can and occasionally do learn something from the business world about finance and accounting. Many businesses have discovered that cost accounting is useless as a decision driver when 80 or 90 percent of total expenses for a typical business are fixed costs--not a function of sales or production volumes. Businesses are

learning that they must take a “systems” view of their firms, identify the primary **constraints** to goal achievement and then work to improve the constraints--first. The folly of “making more so that each one costs less” is an accounting exercise with disastrous results because value is only added to a firm when something is sold and the money is collected.

Manufacturing inventory that isn't promptly sold is the reason for more business failures in the 1990s than any other cause. Ignoring the liability of inventory can be even more damaging than focusing on cost-cutting as the primary means of improving bottom-line results. The same occurs in higher education. Large inventories and cost-cutting are symptoms of a common underlying flawed paradigm: “cost-world thinking:” the tendency to try and improve the bottom line mostly by looking for cost savings in either the organization's resources or in the way they calculate the cost of producing what they sell.

We hear more about cutting costs nowadays than about any other tactic in business--or higher education. What's wrong with cost-cutting? Isn't a penny saved here and a penny saved there worth something at the bottom line? Other than two cents, perhaps not. Cost-cutting has become the halcyon cry of many business managers as they “downsize,” “re-engineer” and spend most of their effort trying to increase profit by finding new little corners where some costs can be reduced. One thing is mathematically certain: cost-cutting cannot provide **continuous** improvement, because sooner or later, a firm runs out of costs to cut. Continuous improvement can only be

sustained on the revenue side of the equation! And what happens when a so-called cost savings (like firing some of the sales department) results in a reduction in revenue?

According to Dr. Eliyahu M. Goldratt, the real answer lies in the system's ability to generate **throughput**--the rate at which the system generates cash through sales. In his 3.8-million-copy bestseller, *The Goal*, Goldratt maintains that it doesn't take a rocket scientist to see that there is far more room for improvement on the revenue side of the equation than on the cost side. He also shows that this is just as true for nonprofit organizations as it is for business; the book even demonstrates its application in a troop of boy scouts!

Many businesses have discovered it's time to do some “**throughput world thinking.**” They now realize that throughput (sales revenue minus raw materials and parts) is the only source of fresh money coming into the system. In the throughput accounting view, direct labor is considered a periodic (“fixed”) operating expense, along with inventory carrying costs, rent, interest, insurance, taxes, etc. Throughput and operating expenses for a given period can be measured accurately, therefore, profit calculations based on these dimensions are much more accurate than traditional cost accounting measurements that attempt to allocate fixed costs to production units--using questionable formulae--that usually result in inventory growth and longer production cycle times.

Higher education must live with the same dimensions as business. Remember that a

college is an economic system as well as an institution of learning. In a college, there are actually two separate (but related) throughputs; one is the inflow and outflow of people (inside, they are called students) whose knowledge levels are increased during their stay. While inside, these people are really a kind of inventory. The school incurs "carrying costs" for having them there; the longer they stay, the greater the carrying costs. Throughput of people is the rate at which a school turns students (inventory) into graduates.

The second throughput in a college is the money flowing through the system. The source of all money throughput is cash received from tuition, fees and external funding.

Throughput measurement works the same in universities as it does in manufacturing firms. The advantage of Throughput-Based Manufacturing (TBM), as Bethlehem Steel Corp. calls it, is that the effect on the firm's bottom line of every action and decision throughout its production, marketing and distribution functions can be measured. "Local" optimizations and efficiencies are not allowed to overshadow the "global" goal of the firm: making more money now and in the future. Even in not-for-profit institutions of learning, **departmental objectives must always be measured against their support of the overall educational goal of the institution.** To achieve those ends, we must measure and enhance both kinds of throughput--people and money.

If we fail to recognize the throughput aspect of our economic issue, then another UDE will eventually replace entity No. [7] in our current reality tree:

[7] Colleges do **not** have the resources to offer desired curricula and degrees.

### **The third internal issue: delivering the product**

Demand assessment is not the only task that must be accomplished. No business or college can survive without delivering the product demanded by its customers (students). In academia, effective delivery requires effective teaching, and teaching effectiveness can certainly be enhanced by using technological advances. Classroom video projectors, pentium computers, internet communications, worldwide web, word processing and data management software are only a few of the tools already available to support the strategies of any college or university. In some cases, however, these technological advances are absent--not because they are unaffordable, but because those who should use them do not use them. It appears that certain elements within academia are either unaware of the overall strategy of their institutions, or are unwilling to support it.

Do "local" elements within colleges willingly support "global" strategies? Do they know what is required from the various disciplines and departments of a college so that the overall strategy can be accomplished? Without assurance of that support, there is no assurance that the college can achieve its goal, even if demand assessment is accomplished correctly. System strategies require system-wide support; if there is a weak link or bottleneck, we must find it and deal with it--**first**. This is another potential UDE in our current reality tree; wherever it exists, it will be devastating.

Here's where we go into the lion's den--the organization's culture! We may know **what to change** and **to what to change**, but we must also determine **how to cause the indicated change**. In any organization, change comes not without resistance.

The general areas that first come to mind in this context are (1) curriculum, (2) textbooks, (3) organization and (4) faculty. Each of these involves long-established **policies** governing everything from course design and student performance to promotions, academic rank, tenure and faculty performance evaluation.

Add to these general areas the political environment of the college. I'm not referring to Republicans and Democrats or capitalists and socialists. To be sure, there is plenty of externally-motivated political activity on American campuses; proponents of everything that is politically correct or incorrect abound! But Washington DC often takes second place to the political infighting, turf protection and backstabbing that occur daily inside some ivy-covered walls of higher learning.

Any change that has a chance of being accomplished will first have to be accepted by those in power. And for them to accept anything, they must first understand it. Otherwise they'll see it as a threat to their personal security and comfort, to which they will respond with strong "defenses" of their academic freedom, professional disciplines and continuity of curriculum--for their "students' sake."

If you ask most ivory-tower academics, they'll tell you they're well aware of "the facts." They'll assure you that their

departments and they, personally, are comfortable with the progress they've made as new teaching tools and technologies have come into popular usage. "Evolution," as some call it, "is inevitable and we are ready for it." Urgency seems to have no place where "tried and true" academic disciplines are concerned; anything not understood is branded a "fad." But urgency does exist and it screams for effective teaching.

If there was one totally understandable description of the word 'urgency,' it was the realization in 1941, not longer after we entered World War II, that "we were losing the war." History has taught us (if we learn from history more than that we don't learn from it) that production is the absolute necessary condition to winning a war: more airplanes, tanks, ships and bullets--plus the ability to deliver them to the conflict. Redistribution, conservation and economization won't work. In the urgency of the present academic struggle, we must insure that we produce and deliver effective academic programs to the social arena.

Some academic leaders see the current reality as demand-driven urgency and increased competition for enrollments and tuition. Their perceptions are supported by the following facts:

**Fact:** competition for student enrollments is fiercer than ever. Academic leaders are not blind to the market conditions, and thus . . .

**Fact:** Almost every college is thoroughly convinced that it must embark on a **process of ongoing improvement**. And so . . .

**Fact:** Almost every college has already embarked on a process of cost-cutting, to the extent that some reduction in quality has resulted. This, in the name of "improvement." These cuts have gored a few 'oxes' already, and so . . .

**Fact:** Many colleges are reluctant to initiate additional improvement projects, but rather are determined to make the existing "improvements" work. This is the scariest one, because it reflects a closed mind to the bigger threats that are coming--those that Perelman predicts.

Clearly, these actions have failed to stem the tide of rising tuition needs. Worse, they have failed to generate significant improvements in product or responsiveness. Instead, many colleges have become internally competitive, intensifying departmental efforts to attract more (not better) students while intensifying current efforts to increase efficiencies and cut costs further. Few are intuitive enough to seek throughput-based solutions, especially those that threaten small empires or challenge the status quo.

It's time for yet another UDE! The facts above strongly suggest that:

[8] Many "local" elements do not support a "global" strategy of improvement.

### **COMPROMISE, CONSENSUS AND OTHER HALF-BAKED SOLUTIONS**

Before we return to the challenges invoked by Lewis Perelman, it's important to understand the nature of academic decision-

making.

Calvin (in a recent *Calvin & Hobbes* comic strip) asserts that "a good compromise leaves everybody mad." Calvin and his almost-live pet tiger had just settled a dispute by reaching a compromise that neither of them liked. But worse yet, the right solution was never achieved. Each wanted more, each got less, and neither got it right.

Politicians gallop around in the world of compromise, retaining their posts by somehow convincing 51 percent of the voters that they had hammered out the best deal the taxpayers' money can buy. In legislative sessions, politicians yield to their opposing numbers whatever is necessary to close the deal and get to the next issue. They support the flawed assumption that for something to work better or be finished sooner, it has to cost more, and vice versa. Price, product and responsiveness (cost, performance and schedule--the government names for these) are seen as "tradeoff dimensions;" to achieve one, another may be sacrificed. At best, two of the three dimensions are achieved satisfactorily. At worst, it's another Denver International Airport: serious physical problems, 19 months late opening and triple the original price. Compromising is planning to fail in at least one dimension. It is failure by design. Higher education is not excused from this fact.

Every major new strategy in academe today demands the cooperation of every school and department within the institution. And these require the understanding of every decision maker in each of these units. What really underlies Perelman's predictions is the inability or unwillingness of so many

traditional academists to look at the future of their institutions from a systems perspective. Without a systems view, cooperation with the global strategies of a college will not come forth; departments will hold their ground while the university around them crumbles under the weight of unanswered challenges from the electronic classroom. The problem is not the unavailability of modern teaching tools, it is the unwillingness to learn how to use these technological advances and enhance teaching effectiveness.

Lewis Perelman merely cites a gauntlet already thrown down by the purveyors of new learning tools already invented. The challenges he describes are real; they're already here and they will increase dramatically. Meeting these challenges will require the collaboration of faculty members, department chairs, deans, administrators, boards, trustees, presidents and chancellors. Consensus solutions will not work in this circumstance; a simple majority is just not enough. It will require everyone's consent and systematic cooperation--no one can give just lip service and trudge back to his department to do things as before. It's too late for that. And it will take more than moderate internal improvements--overhead projectors and VCRs--to compete effectively with screen-based education. This is the worst of compromises: icing on a stale cake.

If consensus and compromise are half-baked solutions that fail to produce effective change, then what can be changed that will enable higher education to serve its customers and thereby survive in a world full of video monitors and online lectures?

### THREE ALTERNATIVES

Suppose today's institutions of higher learning are actually able to successfully address the core internal issues indicated by the preceding analysis--demand, throughput and delivery. Suppose, in some **future reality**, we could accurately measure the demand for courses and cooperate systemwide to produce and market formal degree programs of the type that have defined "college education" for over a hundred years? What would it take to make this happen? It appears we have three alternatives:

- (1) figure out a way to make these degree programs viable in the new marketplace in their present formats, or
- (2) abandon the old formats completely and join the movement to an electronic classroom that offers students just-in-time education, or
- (3) change them so as to make them viable while still preserving their proven value as formal credentials of knowledge gained, skills acquired and learning abilities demonstrated.

The first alternative--keeping the present format--implies total rejection of the validity of Perelman's predictions. This is, in other words, an assumption that mastery of the internal issues in higher education today could constitute a complete solution not only to academia's current problems, but to those problems about to be generated as more electronic classrooms spring up to seduce away tomorrow's students and their employers.

The second alternative--abandoning the old formats and joining the electronic movement--implies a total rejection of the system that has endured for decades and outlasted many past challenges. This is, in effect, a total acceptance of Perelman's predictions and a callous disregard for the intrinsic values of a cohesive, structured educational system.

The third alternative--changing higher education in ways that preserve its formal credentials and yet keep it viable amid the onslaught of computers, online services, interactive software and multimedia technology--implies that a process of ongoing improvement can be devised and instituted that will take advantage of emerging technological advances, but do so in a framework of traditional program structures offering state-of-the-art courses. This would require both the acknowledgment of Perelman's implications and a determination to preserve the credibility of a well-run, well-disciplined institution whose graduates can perform as professionals in the fields in which their degrees are awarded. This is not compromise; it is the realization that the **goal** of higher education is the delivery of organized knowledge now and in the future, and that technological advances are **means** of achieving that goal.

The first alternative is naive; we already see the changes and challenges of Perelman's predictions increasing all around us. If we do what we've been doing, we'll get what we've been getting--farther into debt and more out of step with reality. There is no logic in this approach.

The second alternative is cowardly: "if we can't lick them, join them." It would also be

an irresponsible abandonment of the values and educational processes we intuitively know are effective in any society.

The third alternative is neither naive nor cowardly, which means it requires wisdom as well as courage of those who would attempt it. And it has one exceptional merit, something often overlooked: a balanced solution that permits both our logic and our intuition to work together. When logic and intuition are in accord, the solutions are usually correct. It is far above compromise; it is a win-win solution.

### **THE SUPPLY SIDE IS OUR SIDE**

Lewis Perelman misses the real point; he fails to see the supply side of the economic equation in higher education. About twelve years ago, the "supply side" economists made their point politically, but they failed to educate most Americans about what they meant; that while demand dollars drive the economic system, they fuel the huge engine of production and delivery that wins wars and stimulates that "good old American know-how."

Logic and intuition are clearly on the supply side. Customers may decide what they will buy, but the product will only be manufactured (and the academic programs developed) when the manufacturer invents an effective product-price-responsiveness strategy and gets every part of the organization aiming at the goal of the organization.

Perelman misses still another point when he asserts that the electronic classroom can meet instant demand changes with instant supply changes. Course and program

development is an evolving process. Even football's famous "hurry-up offense" takes months of pre-season training and practice to work effectively. Only the huddles are skipped to save time when the clock is ticking and more points are needed on the scoreboard.

Higher education's clock is indeed ticking. We can't supply "instant Einsteins," but we can certainly avoid the "huddles" that have traditionally kept course and program development at a snail's pace. We already have the resources and experience that can create "hurry-up" educational development and enhanced teaching effectiveness; we are inherently better equipped to meet demand changes than the emerging purveyors of "instant education." These online experts will likely find that the courses they offer don't fit together; they may even compete with each other in both theory and process to the extent that the outcome is unorganized for them and totally confusing for the student. This is their supply-side dilemma.

### **THE DEMAND SIDE IS OURS, TOO--IF WE WANT IT**

The emerging army of electronic classrooms has no requisite organization structure that will determine what each of them should produce. As a result, most of them will overlap frequently in search of market niches. Without organization, a spate of "instant education" programs will routinely emerge; some will prove successful and the rest will fade away to be replaced by others. Moreover, these programs will never add up to recognized degrees and credentialed students who can market their knowledge to future employers as they head down the road

of professional life.

In manufacturing, a "just-in-time" inventory level is just one more unit than "not-in-time"--a dangerous approach when applied throughout the factory. When a capacity-constrained resource (the slowest machine) is idled because it has nothing to work on, time is lost to the entire system. Wise production managers avoid this problem by placing protective (buffer) inventories in front of constrained resources (contrary to JIT concepts) and then scheduling the input of materials into the first process to keep inventories from growing all over the system.

JIT is a good "pull" or demand-driven process, but it is inherently unable to handle unforeseen problems with supply that are caused either by increasing demand or interruption of supply. For Perelman's "just-in-time educational programs," the chances are very high that the suppliers will not be able to manufacture instant education as demand changes occur; neither will they be able to correct for any lack of capacity to meet demand.

Current higher education concepts cause almost the opposite problem. Because we are driven by entrenched forces including tenured faculty and strong cultures, we tend to remain a "push" system. Like older "push" factory scheduling systems, we tend to build inventories of students that act like inventories of unfinished product. Some are lost, some are diverted to other outcomes and some never make it through. This has been our demand-side dilemma. The good news is that our capacity to deliver is still in place! What is lacking is a systems thinking

process that identifies the underlying policy constraints currently preventing us from offering courses for which demand is increasing and phasing out courses for which demand is decreasing. As the supply-siders insist, it is easier to satisfy demand with resources we already possess than to try and develop the resources only after the demand is identified.

### **COMING FULL CIRCLE**

This paper started with predictions by Lewis Perelman about higher education's inability to compete with a plethora of oncoming low-priced high-tech educational offerings. That these offerings are present and increasing is not contested.

Perelman's assertions stem from his belief that American professors cannot compete because "they are selling a product that is ridiculously expensive and ill-suited to the needs of a rapidly changing economy." He supports his assertions with valid financial data about the price of higher education, but he offers only opinions about what students should learn and when their employers want them to learn it in the age of the Internet.

Perelman infers that the professors in today's higher education institutions are incapable of enhancing their teaching effectiveness, and that the art and science of teaching as we know it will give way to technological advances which traditional academia cannot or will not use. According to Perelman, we are no match for the images on the computer screen, video tapes and multimedia technology of the future.

The foregoing discussion revealed some serious flaws in Perelman's logic. However,

it also revealed a serious lack of logical systems thinking within academia about the internal core problems that cause the undesirable effects Perelman cites. This paper has shown that any institution of higher learning can use a businesslike systems thinking process to analyze its internal problems logically and create effective solutions. It concludes that delivering a timely educational product at a market-driven price is well within the capability of almost every American university, provided that all involved persons are ready to identify and correct the policy constraints that currently exist.

### **SOLVING THE PROBLEM WITH TECHNOLOGY**

This paper serves to remind us that technological advances in the art and science of teaching are just as available to traditional academists as they are to the "commercial learning companies of the future." But application of these tools by today's professors will not alone solve academia's problems. We can extend the reach of our campus with them. We can enhance our lectures, duplicate ourselves magnetically, demonstrate, calculate, communicate, compute and display with them. We can reach additional people--especially those who cannot come to us--with these tools. We can even use them to make ourselves better educators. But then so can anyone else who decides to get into the teaching business and offer "just-in-time" education.

Simply matching these so-called "learning companies" keyboard-for-keyboard and screen-for-screen isn't enough. Let's not forget the supply side resources we already possess: credentialed degree programs and

established organizations with the capacity and experience needed to measure demand, create new courses and deliver them in structured degree programs. But that was never the question.

The real question (and the final question for this paper) addresses both the organizational and technological aspects of higher education:

“Will today’s academists be willing to subordinate local (departmental) objectives to the global (university) goal, learn to incorporate technological advances appropriately into their teaching activities, and use them effectively as tools for improving learning outcomes?”

If the answer to the above question is “yes,” then academia will continue to be the primary foundation for learning. There, and only there, will abstract subjects like mathematics and basic subjects in the sciences--which involve many years of learning without direct application in the business world--be taught. The availability of advanced teaching tools isn’t enough to create deep interest in these topics that can never be learned “just in time.”

Oliver Wendell Holmes once said, “trouble brings with it the capacity handle it.” Academia has the option of fighting the UDEs and ducking the incoming shots from so-called “learning companies,” or of focusing on global goals and using these remarkable new tools in even more inventive ways than they do.

Education is not a revolving sequence of current topics, it is an ongoing evolving

service to mankind to be preserved and protected by institutions that can foster the axiomatic discovery of principle, teach people how to think, and inspire each student to be a creative person who gives something to this world.

The university is also a place; a physical location in which student and professor interact eye-to-eye, where students can question the clarity and accuracy of the teacher’s words. It is a forum in which teachers can lead the students to discover and invent knowledge through Socratic teaching methods that can only be used when the teacher can see the faces of his students, assess the meaning of their expressions and questions, and draw on their reactions to choose the next words s/he uses.

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Melvin J Anderson, Ph.D.

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**THE CHALLENGE OF TEACHING ADULTS**

by

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**ABSTRACT**

This Paper will concentrate on offering to attendees some tools to utilize in meeting the challenge of teaching adults, as we approach the twenty-first century. The Paper will discuss such areas as what motivates adults to return to college, how to satisfy their needs, and how adults learn. The Paper will also touch on human relations and the learning process, and on the power of participation, and will offer a plan for participation. The Paper will cover formats for group work, processes that affect group productivity, assigning group grades, and handling student questions; and will conclude by offering some simple guidelines for more effective teaching.

**PAPER**

According to Dr. Bill Herlehy of Embry-Riddle Aeronautical University, "the mature, adult learner who works full-time in a profession does not bring the same experiences and expectations to the classroom as does the traditional full-time student."(1) I can certainly identify with this statement, having been a mature, adult learner myself, working full-time while trying to obtain my degrees. Thus, it is very important to remember that conducting classes in the traditional manner is not the way to approach this unique population. Rather, teaching adults requires understanding their behavioral characteristics, what motivates them, how they learn, and what instructors can do to meet the special needs of this challenging group.

students have, what motivates them, what are the "real" reasons they are taking the course? Then, work at modifying the standard course work and content accordingly.

There are certain basic needs which influence or motivate behavior throughout a person's entire life span. We are all familiar, no doubt, with Abraham Maslow's Need Hierarchy, and how a person will satisfy lower internal needs before moving to another level. Figure 1 shows the overall groups of needs and their ascending order.

A person moves up and down the hierarchy depending on what is going on in his or her life at the time.

Now, how can instructors help adult students satisfy these basic needs? Good instructors can do this by establishing a supportive classroom atmosphere in which each student receives a great deal of attention. But, why not go one step further and determine what specific interests the

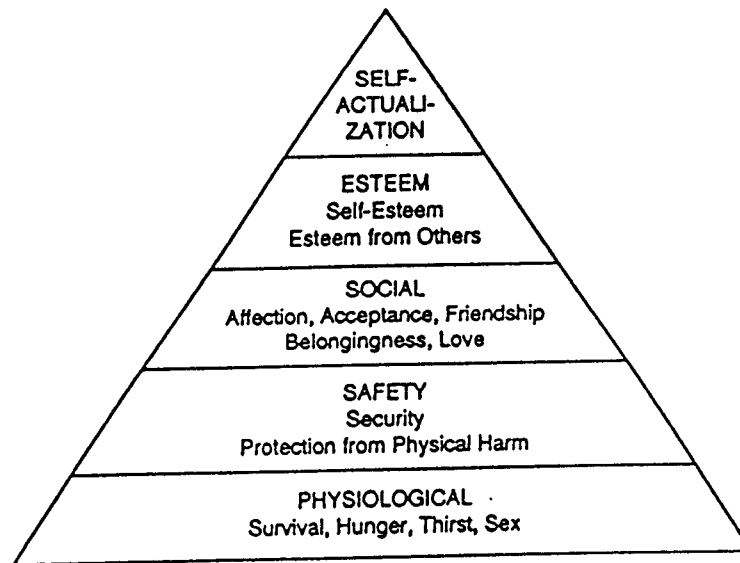


Figure 1 - Maslow's Need Hierarchy

### **ADULT MOTIVATION AND WAYS TO SATISFY ADULT NEEDS**

What do you suppose are some of the most common reasons adults are motivated to attend college? Perhaps they need to feel important, to improve their self-esteem; perhaps they are looking for a friendly, social atmosphere; perhaps they want social approval; perhaps they are looking for an escape mechanism to avoid pain, either mental or physical; perhaps going to school is relaxing for them, and reduces tension; some do it because they want to discover and learn something new; some are looking

for heterosexual adjustment; some are trying to become independent.

Instructors must always create an atmosphere conducive to assessing students' motives and successfully satisfying them. Take, for instance, a specific, identified need such as "to gain a certain skill or knowledge." Here students would want to know how the course work would meet their needs. And this is where the Syllabus can help. Instructors need to identify in the Syllabus the goals and objectives they have set for the class.

It is also very important for instructors to learn why each student enrolled in the course. This can be accomplished by surveying the students on the first day of class. By means of this survey, instructors will find out why the students are taking the course; what they expect to do with the knowledge they obtain; what pre-conceived ideas the student has about the subject matter; what "on-the-job-experience" the student has on the particular subject. The survey can also include questions on students learning preferences--small groups, lectures, independent study?

Another way to gather information on students' backgrounds is to ask them to write a brief autobiography, placing emphasis on their experience with the subject being studied.

An exercise I have found very useful in my classes is to divide the class in groups of two students each. Group members are required to interview each other using a questionnaire I provide, and take notes during the interview. At the end of the exercise, students introduce their interviewees to the class. This works great as an ice breaker and gives the students an opportunity to meet their classmates. Figure 2 provides an example of this questionnaire.

<b><u>PERSONAL</u></b>	
Date _____	Course Number _____
Course Title _____	
Name _____	Telephone (optional) _____
<b><u>EMPLOYMENT</u></b>	
Employer _____	Telephone (optional) _____
Job Title _____	
How long in that profession? _____	
<b><u>EDUCATION</u></b>	
Academic Ranking (undergraduate, graduate)? _____	
How far into the degree program? _____	
<b><u>GENERAL</u></b>	
Why are you taking this course? _____	
How do you hope to use what you learn in this course? _____	
What on-the-job experience have you had relating to this subject? _____	
_____	
How do you learn best (small groups, lectures, independent study)? _____	
Discuss briefly your background? _____	
Any hobbies? _____	
Any pet peeves? _____	
If you were an animal, what animal would you be and why? _____	
_____	
Any other interesting traits? _____	

Figure 2 - Student Profile Questionnaire

Regardless of what method instructors use, it is very important that they take into account not only the goals they have for the course, but also the goals the students have, and their backgrounds and learning preferences.

### **HOW ADULTS LEARN**

Another matter to keep in mind is that many older students learn better when they feel they can apply their learning to everyday situations. "Adult students are very task oriented, wanting and expecting their learning to be applicable to problems

with which they are being confronted daily."(2)

This can be accomplished in several ways. One way could be to assign to one student, or to a group of students, the writing of a case study on situations the students are facing, or have faced, on the job. These cases will, then, be analyzed in class. Another way could be to assign students to interview a professional in the field, utilizing the principles being learned in the course; then discuss the results of the interviews in class.

Research has demonstrated that previous learning experiences play a large role in how adults relate their learning to what they already know. Thus, problems and examples must be relevant to this existing knowledge and must also be realistic.

"When presenting information that is new to the student, it is important to help them integrate the new information with information they have already acquired."(3)

A variety of teaching techniques can be used here. One could be to elicit active student participation on the subject and on alternative ways to complete the task. This can be accomplished through large and small group discussions, asking the student questions, role playing. Instructors can also share examples from their own experience, and discuss them with the class.

It is important to remember that better learning takes place when students are actively involved in what is being taught. The climate for learning also plays a big

role. This is one way in the classroom in which adult students can fulfill the social, safety, and self-esteem needs stated in Maslow's hierarchy of needs. A warm, social atmosphere in the classroom, where you and your students know each other by name; an emotional atmosphere of trust and freedom, and a relatively tension-free emotional climate, can contribute to confidence and security. Instructors need to reassure students that all ideas are important and welcome, that no judgment will be passed. This will foster a feeling of belonging.

Instructors also need to show enthusiasm about the students taking the class. Make them realize you want to help them reach their educational and career goals.

Another important aspect to consider in teaching adults is feedback. Learning is greatly enhanced when students receive feedback on how well they are doing in class. This will help the students measure their progress and will provide them a sense of achievement. Grades could be one way to provide feedback, immediate praise for success could be another. Provide feedback in a timely manner by returning graded papers promptly.

Instructors need to keep in mind that adult students also have egos, and some of them are more fragile than others. Lavish praise, especially in front of their peers, can do a lot for those egos and for motivation to continue learning. Give positive reinforcement by concentrating on the positive aspects instead of the negative ones.

## HUMAN RELATIONS AND THE LEARNING PROCESS

Let's stop for a minute and think about human relations and learning. It is important to recognize some of the ways students' emotions can be expressed. One way could be through **Projection**--blaming the instructor for their own weaknesses. Students could also **rationalize** the reasons for their weaknesses, which may or may not be the real base. Students could also express their emotions by being discourteous, loud, showing anger, contempt, in other words, through **aggressiveness**. Another way could be finding excuses to miss class, or **flight**. A final way could be showing little or no interest in the class, or **resignation**.(4)

Instructors need to remember that they represent the college to the students. The following five basic human relations practices will help the instructor overcome these blocking mechanisms:(5)

1. "Help students set reasonable standards for themselves, which they can achieve." Instructors need to help students identify their strong areas, as well as their weak ones, and set their standards accordingly.
2. "Help the students help themselves." Instructors need to guide students in resolving their academic frustrations themselves, rather than coming up with a solution for them. This will provide the

students an opportunity to develop in this area. Remind students you are there to help them learn rather than to make them learn.

3. "Keep students informed." Let the students know exactly what to expect at all times. Make expectations clear by defining course goals and objectives.
4. "Encourage the students to tell you how they see you as a leader of the learning group." Ask for their feedback, for ways in which you can help them increase their learning process.
5. "Finally, in adult education, the Golden Rule holds as true as ever. Treat your students as you, an adult, wish to be treated."

## THE POWER OF PARTICIPATION

A powerful tool to meet the challenge of teaching adults is through participation. Research has shown that students remember less than 10 percent of what they are told, and their chances of remembering what they are told and shown is one out of four. But when they actively participate, the event or experience is etched in their minds, their attention span and energy level increase, and the flow of information helps the instructor make the message more useful.

I believe strongly in participation,

and I always make it at least ten percent of the final grade. My students always know at the beginning of the course they are expected to participate actively as opposed to passively, but I don't force anyone to do it, for I believe participation works best without pressure and it should be fun. Students don't enjoy being intimidated, threatened, or made to look inadequate in front of their friends anymore than any other adult would, therefore it is important to make the participation easy and enjoyable for everyone.

### A PLAN FOR PARTICIPATION

One way to illustrate what I have stated above is to develop a plan for students' participation during the course. This plan should enable the students to state and restate goals, select areas that need to be emphasized, and suggest ways to meet these interests. Examples of ways to stimulate student participation could be:(6)

- a. Standing committees established for the duration of the class
- b. "Buzz-groups"
- c. Class discussion of "next steps"
- d. Interest-finding questionnaires.

The publication stated in Footnote 5 also suggests the instructor find methods and techniques appropriate for "the level of development of the class and the maturity of their understanding of the subject matter." Examples of individual maturity measures could be norm tests, biographical information, and individual conferences. Examples of class maturity measures could be general class discussion topics, the degree

to which the class accepts democratic methods, and observation of the types of leadership and fellowship displayed.

Instructors should avoid making all the decisions on the class activity, or being the center of the action. Rather, their goal should be to delegate authority, give

constant encouragement, and free the class to display their initiative and share the responsibility.

### FORMATS FOR GROUP WORK

Now let's consider formats to use in getting students involved in group work. We will discuss a few of them, from the several that are available.(7)

1. "Think-Pair-Share". Students are required to either think or write their answer to a question asked by the instructor. Their response should include evaluation, analysis or synthesis, and should be shared first with a partner, then within a four-person learning team, and ultimately with a larger group or with the entire class. This exercise gives the students the opportunity to learn by reflection and verbalization, and it improves the caliber of the discussion.
2. "Three-Step Interview". Students share information with each other during a paired interview. What they learned in this interview is

then shared in a four-member learning team. The information could be a reaction to a film or article, or a hypothesis. This exercise can be used as an icebreaker.

3. "Simple Jigsaw". The instructor divides the class into teams and an assignment or topic into four parts. One student from each team volunteers to become an "expert" on one of the parts. All the "experts" on each part work together to master it and discuss the best way to help the other students learn it. Then the "experts" go back to their home teams and teach the other group members.
4. "Structured Controversy". Class is divided in teams and assigned a controversial issue. Each team assumes a different position, and is responsible for discussing, researching and sharing its findings with the rest of the class.

### **PROCESSES THAT AFFECT GROUP PRODUCTIVITY**

Not all groups work well or efficiently. Instructors and students need to be aware of processes that affect group productivity. Let's examine some of them:(8)

1. Some students don't believe others in the group will perform up to their standards, so they decide to do all the work themselves and discourage others from becoming involved.
2. Some students are "no-shows" throughout the duration of the project, and no one knows how to contact them.
3. Some students have good ideas and don't hesitate to offer them and to force their solutions on the group. They don't listen very well to others' ideas and constantly push everyone in their direction, whether they agree or not.
4. And then, there are those students who attend all meetings and come well prepared, but are so quiet the others forget they are there.

How do we deal with these unwelcome group member characteristics? One way is to ask small groups of students to discuss them and come up with strategies for dealing with these behaviors. The answers will, then, be shared with all the groups.

### **ASSIGNING GROUP GRADES**

What about group grades? Suppose you assign a group research as your term project and ask that a paper be written on it. Is it fair to give all the group participants the same grade? How do you know if they all put equal amount of effort? Will group grades undermine motivation?

What I have found to work well for me, is the following. I make it clear in the Syllabus and on the first day of class, that the group research project is worth 20% of the grade, or whatever percentage I decide to give. I ask students to write a combined team report on the team's findings, and present it orally to the class on the next to the last class meeting. Each report must start with an introduction section describing the team members, their mission, their objectives, and their approach. All team members must sign this report and participate in the oral presentation.

In addition, each team member is required to write an individual assessment of the project and turn it in separately on the last class meeting. This assessment is totally confidential and contains the following:

- A. What the team member learned as a result of participating in the project
- B. The team member's relationship with other team members:
  - Was there harmony?
  - Was there agreement or disagreement with other members?
  - Any communication problems?
- C. Did all members participate

and contribute equally?  
Discuss in detail.

D. Any additional comments

I grade the oral presentation based on my own assessment. The confidential paper helps me greatly in assigning grades to the participants on the written report.

I have gotten raving reviews from my students on this type of team project; they think it is challenging, exciting, and a very worthwhile learning exercise.

### **HANDLING STUDENT QUESTIONS**

Now let's change the subject and discuss how to handle student questions. Since adult learners have rich backgrounds which can enhance the classroom learning experience, why not redirect their questions to other students. This not only shows all of them that their peers are a resource for learning, but also encourages more student participation.

Another technique is to answer the question by asking another one; in other words, direct students to something learned previously in the course that would answer the question. Or the instructor may want to ask several students to comment on the question, so as to get differences of opinion about the answer and spread the participation across the class.(9)

"Adjunct Info." offers the following suggestions regarding students' questions:(10)

1. "Encourage questions". Indicate there are no "stupid" questions; tell them someone in the class might want to ask

the same thing but is perhaps afraid to do so, so their questions are helping other students; state that you like them to ask questions because it helps you teach better; make them believe their questions are "intelligent" ones.

2. "Emphasize that 'errors are useful tools for learning'". Tell them you are more interested in receiving "wrong" answers than "right" ones. Why? Because the "wrong" answers indicate to you where the students' confusion lies and what you need to do to help them.
3. "Create a safe learning environment". Make them realize no one will laugh at their mistakes in the classroom, and that you are all there to learn from each other. Assure the students you will not call on them unless they volunteer.

Instructors need to remember that many older students experience insecurity and doubts when they return to school after having been absent several years. They may be afraid to ask "stupid" questions or embarrass themselves in front of their peers, and this can keep them from succeeding academically. Therefore, they need extra encouragement and help in building their confidence. Listen with empathy, try to understand and to "walk in their shoes". Remember that adult students bring a lot of

baggage with them to the classroom; try to look for win/win outcomes. Always keep in mind that to the students, you are the college.

One recommendation that appears very useful here is the use of study partners.(11) Students are encouraged to select study partners the first day of class, after a get-acquainted activity. This helps in several ways. For example, if one of the partners is absent, the other is responsible for taking notes and assignment/handouts; and for handing in or collecting papers or homework. If one of the partners is afraid to ask questions because he or she feels they are too simple, the other partner is responsible for answering or discussing those questions. This technique solves the problem of absent students not having assignments, missing the contents of the lecture, or turning in late papers.

### **SOME USEFUL TEACHING TECHNIQUES**

How do we select teaching techniques that will meet the challenge of teaching adults? How do we determine what works best in a particular situation and with a particular group? Just as when giving a speech it is so important to know your audience, when teaching adults it is very important to know your student population. The student profile questionnaire depicted in Figure 2 is a tool that can help you determine what method to put more emphasis on for that particular group.

Perhaps group discussion, case analysis, independent research, a combination of all of them, or possibly some other method. But whichever one you

select, be sure to stimulate interest by doing a meaningful activity the very first day of class. Remember it is very important to make students think, not just memorize. Therefore, provide opportunities for students to make inferences, draw conclusions, compare and contrast.

It is important to review the previous class at the beginning of each class session, and to give the students the opportunity to ask questions or to raise concerns. Then close the session at the end of each class and give an overview of what's coming up next, including the homework assignment.

Let's discuss other simple guidelines for more effective teaching.(12) The first one has to do with showing your enthusiasm for teaching. Instructors must convey their love for the subject being taught, even if they have been teaching the same course material for years. It is important to keep in mind students are being exposed to the subject for the first time, and the instructor's enthusiasm, or lack of it, can make or break the students' interest and motivation.

Another guideline is to learn as much as possible about the students. Why is this important? Because the more the instructors know about the student population in the classes, the more easily they will be able to tailor the class to the students' needs.

A third guideline deals with organizing each class session well. How can instructors do this? By using the principles of a good speech--an attention-grabbing introduction, a well-organized and logical "body" or main points of the presentation; and a summary of the key points instructors

want students to remember from the class session.

Guideline number four also draws from good public speaking--using a presentational style that will hold the students' attention and interest. How? By establishing and maintaining good eye contact with the students; by using gestures effectively; by varying the voice level; by changing the facial expression, by moving around the classroom. All of these will greatly enhance the students' recall.

And finally, presenting material in a variety of ways. In today's academic environment, it is not enough to stand behind the lectern and deliver a long lecture while students take notes. Today, instructors need to minimize this approach and combine it with good class discussions, simulation exercises, group work, and the latest audiovisual materials, such as transparencies, videos, slides, charts and graphs, and flipcharts, in addition to the blackboard.

### CONCLUSION

In our quest for finding ways to meet the challenge of teaching adults, we have discussed what motivates adults, how to satisfy their needs, and how adults learn. We have touched on human relations and the learning process, on the power of participation, and have offered a plan for participation. We have covered some formats for group work, processes that affect group productivity, assigning group grades, and handling student questions. And, finally, we have offered some simple guidelines for more effective teaching.

As we approach the twenty-first

century, we need to move ahead and grow as good instructors. This involves the willingness to embrace new technologies in our fields, to find newer and more innovative ways to encourage and motivate our students in their academic pursuits, to impart freshness and enthusiasm each time we teach the same course, even though we may have been teaching it for years. We must fight inertia, we must resist the temptation to stay as we are, to keep doing things the way we have done them for years.

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***SOME THOUGHTS ON EFFECTIVE TEACHING IN  
HIGHER EDUCATION***

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**ABSTRACT**

This paper discusses a number of challenges which faculty members face in their individual and collective quests for achieving teaching effectiveness in higher education. The paper is based on the premise that teaching in higher education settings demands a range of skills and expertise far beyond a knowledge of subject matter and the use of various instructional technologies. The following major issues are examined: Developing a philosophy of practice, having empathy for the learner, avoiding a dependence upon standardization of procedure and technique, expecting and accepting ambiguity, avoiding tendencies of perfection, researching the learner's background, observing how students learn, communicating ideas with colleagues, trusting one's instincts, creating meaningful diversity, taking prudent risk, recognizing the emotions of learning, acknowledging and accepting one's personality, balancing support and challenge, recognizing the significance of teacher behavior, and viewing oneself as a facilitator of learning.

## **Introduction**

Effectiveness as a concept has enormous appeal (Beidler, 1986; Brown and Atkins, 1987; Hoadley and Vik, 1989). It suggests that there are standardized practices that apply with equal relevance to every context within which teaching occurs. Were this true, then the world of college teaching would be much cleaner and simpler than it is in reality. All that teachers would need to do would be to learn the simple rules of effective practice, acquire the necessary techniques, and then practice these in college classrooms. This would produce a cadre of practitioners, all doing the same things in the same way, and all of whom would be regarded as exemplars of effectiveness. The clarity, simplicity, and order of such a world is what many administrators and teachers yearn for, and were it to exist in reality, it would mirror perfectly the assumptions under which many colleges function.

Seeing effectiveness in this way, however, ignores the inchoate messiness of college teaching. The concept is decontextualized, thereby rendering it remote and irrelevant to teachers who are grappling with the dilemmas, distortions, and ambiguities of practice. Effectiveness is irrevocably contextual (Pratt, 1988). What is effective in one context, with one student or group of students, or for one purpose may be severely dysfunctional in another context, with different people, or for another purpose (Cervero, 1989).

Effectiveness is also irredeemably value-laden. The decision concerning what constitutes effectiveness rests on certain judgments and interpretations.

Whenever one concept of effectiveness gains ascendancy over others, the power struggles between groups that are seeking to define this concept in their own ways are clearly evident. What are effective behaviors for one group of teachers may be examples of psychological bludgeoning for another. What one teacher may consider an effective teaching effort a student may see as a demeaning experience. So talking about effectiveness as if it were an objective concept whose features can be easily agreed on by all reasonable people is mistaken. We always have to ask: Effectiveness for what? Effectiveness for whom?

In a sense, effectiveness is also a phenomenologically derived concept, one grounded in students' perceptions of what is happening to them and in the meanings they attach to these experiences. Equating effective teaching with how well teachers perform a previously defined set of behaviors risks neglecting entirely the effect these behaviors have on students, thus rendering the student's experience irrelevant.

To determine whether teaching is effective, we must, ultimately, see whether students are learning. Anything that helps students learn is good, effective teaching (Ericksen, 1984; Hayes, 1989). Anything that hinders their learning is ineffective teaching. Sometimes what most hinders students' learning is a teacher's determination to behave according to some well-defined notion of effectiveness.

The following thoughts are applicable to the varied contexts in which college teachers teach and college

students learn.

### **Be Clear About the Purpose of Your Teaching**

Develop a philosophy of practice, a critical rationale for why you're doing what you're doing. Possessing such an organizing vision will help you withstand those inevitable episodes when the puzzlement or opposition expressed at your efforts by students, colleagues, and administrators cause you to wonder whether you should continue teaching. Your vision will also help your students feel that they are under the influence of someone who is moved by well-thought-out convictions and commitments. Without a personal organizing vision we are rudderless vessels tossed around on the waves and currents of whatever political whims and fashions are prevalent at the time. Our practice may win us career advancement, but it will be lacking in the innate meaning that transforms teaching from a function into a passion.

Effective teachers are critically responsive teachers. Although they are sensitive to contextual factors such as organizational necessities, students' experiences, and political climates, they have a clear rationale for their practice. The organizing vision for college teaching proposed in this paper is the fostering of the critical thinking necessary for students to be able to reflect on the habitual assumptions underlying their actions and ideas.

### **Reflect on Your Own Learning**

One of the best ways to improve your teaching is to experience, and to remember, what it feels like to learn something, especially something new and difficult. Reflecting on the experience of learning has some very powerful implications for your teaching. It will make you aware of the behaviors that affirm and encourage students and those that intimidate and hinder them. It will help you temper your criticism so that it is not interpreted as a personal assault on students. It will sensitize you to some of the typical rhythms of learning – such as incremental fluctuations and the attainment of learning plateaus – which will, in turn, prevent you from making needless and possibly harmful interventions. It will give you new insight into why and how people resist learning and what some useful responses to this resistance might be.

So, resolve to spend some time each term, or even annually, in the role of a learner. Keep a learning journal of the highs and lows you experienced and what you think occasioned these. Then reflect on what these experiences mean for your teaching practice.

### **Be Wary of Standardized Models and Approaches**

Teaching and learning are such complex processes, and teachers and learners are such complex beings, that no model of practice or andragogical approach will apply in all settings. A lot of fruitless time and energy can be spent trying to find the holy grail of

andragogy, the one way to enlightenment for college teaching. No philosophy, theory, or theorist can possibly capture the idiosyncratic reality of your own experience as a teacher. Don't think that Freire, Dewey, Tyler, Rogers, or anyone else possesses the truth that fits your situation exactly.

You can draw much that is useful from the different models of practice that are available. But you should feel no compunction about rejecting elements of these, changing other parts of them before applying them in your practice, or abandoning them entirely when they don't fit. These models can be useful starting points, particularly when you're working in an unfamiliar context. But don't expect them to relieve you of the necessity to make endless judgments and choices about what works best and why. Making these judgments – sometimes rightly, sometimes wrongly – is the essence of teaching, and no generic model of practice will allow you to abdicate this responsibility.

### **Expect Ambiguity**

Participating in staff development programs or reading textbooks of practice can give you the idea that teaching is a rational, ordered process in which previously designed methods and curricula are put into practice to achieve expected outcomes. But teachers quickly realize that teaching is often a journey into uncertainty in which they unlearn their reliance on standardized models and curricula.

As teachers we cross the borders of chaos to inhabit zones of ambiguity. For every event in which we feel things

are working out as we anticipated they would, there is an event that totally confounds our expectations. It is difficult enough to predict what one person's response to a particular event will be, let alone to predict the responses of a group of students to the series of events we have planned in just one lesson unit. Contextual factors will distort the most perfectly planned curriculum or classroom project.

The one thing we can rely on with some certainty is that events will alter our neatly conceived plans. These events will sometimes be serendipitous, sometimes disastrous. But inevitably they will occur, so we need to learn not be thrown off track by them.

### **Perfection is Impossible**

Expecting perfection in one's performance as a teacher will have one of three consequences: (1) You will develop an ulcer in short order; (2) You will become so demoralized at your inability to achieve perfection that you will leave teaching entirely; or (3) You'll develop a cynical belief that your actions don't matter because nothing works anyway. Perfection in terms of one's personal performance is a fantasy. You will never achieve it, and in pursuing it too unrealistically you will become so obsessed with your own actions that you'll forget the real reason for teaching – to help students learn.

In terms of students' reactions to your efforts, you will rarely find that everyone with whom you are dealing thinks that what has transpired is somehow inspirationally transformative. Indeed, for every student who embraces change

there will be one, or maybe more than one, whose energies will be wholly devoted to resistance. It is easy to become obsessed with these students who seem, stubbornly, to “refuse to grow” (Daloz, 1988) despite all your best efforts. But be wary of becoming obsessed with proving to yourself that you can be the perfect teacher by making even the most recalcitrant students become passionate advocates for your subject. No action you take will produce universally felicitous consequences. Every teaching choice is essentially a trade-off, entailing advantages and disadvantages. Try to learn to accept that if the overall advantages of one course of action outweigh its disadvantages, it is worth pursuing.

#### **Research Your Students’ Backgrounds**

Before beginning any educational effort involving a group of 30 or fewer students, try and do as much research as you can on your students’ backgrounds – their cultural values and allegiances; their experiences; their expectations; their language; and their most pressing concerns, problems, and dilemmas. If you can’t do this before the educational activity begins, try your best to carve out some time in the first one or two sessions to explore these characteristics.

To teachers impatient to get cracking on the important work of teaching, this research effort can seem like an indulgent waste of time. But, if you are impatient about starting teaching, the chances are that this impatience grows out of a conviction that what

you’re teaching is important for students to know. And if you believe that something is important for students to know, then you’re going to want them to take as much notice of it as possible and to see their learning as relevant and connected to their lives. If you neglect researching your students’ backgrounds and cultures, however, you run several major risks. You risk spending a lot of time preparing lectures that are delivered at an inappropriate level or which fail to show any connections between your subject and your students’ concerns. You risk producing materials and exercises that neither motivate nor illuminate. You also risk creating at the outset a level of learner resentment and resistance that will take a long time to dismantle.

#### **Observe How Students Experience Learning**

A constant feature of your teaching should be a concerned effort to understand how students are experiencing learning. You can watch for nonverbal reactions, but these can be misinterpreted and there is a limit to how much they can convey. So take the time to include regular formative evaluation sessions in your classes, in which you ask for opinions on how things have seemed so far, what might be changed, what has failed to work, and so on. Try to get students to document their perceptions of learning in journals.

When you have some understanding of the most typical rhythms of learning and of how your actions are being perceived, try and think

how you might make your practice more responsive to these features. It won't always be possible, or desirable, to make major adjustments. Not only will contextual constraints prevent this, but there will also be times when you have to make the judgment that while something appears problematic or puzzling to students as it is being experienced, it's your belief that its relevance will eventually become clear. But there will be other times when it is quite right to adjust what you're doing or to abandon it entirely in favor of something that connects more directly to students' experiences.

### **Talk to Your Colleagues**

Because college teachers spend so much of their time in classrooms, they can easily develop a sense of isolation and a distorted perception of their own dilemmas, problems, and failings. When teachers do talk to each other, their conversations often concern administrative necessities and procedures. Yet private and informal talks about varying responses they generate to crises and dilemmas can be enormously helpful.

The revelation that you are not the only person who sometimes feels that things are moving beyond your control can be enormously reassuring. It can help you avoid the emotional self-flagellation characteristic of those who engage in the quest for perfectibility discussed earlier. The realization that your perceptions of your ineptitude and inadequacy are felt by other teachers about themselves generates a sense of relief.

On a specific level, you can learn

a great deal from listening to descriptions of how other teachers working in context similar to yours deal with the dilemmas, crises, and problems you yourself are facing. You can probably adapt some of their responses directly to your situation, as well as experimenting with variants on their strategies and tactics.

### **Trust Your Instincts**

Many teachers are socialized into believing that the knowledge and insights contained within textbooks have a greater legitimacy than the knowledge and insights they themselves generate in response to the particular crises and dilemmas of their own situations. Although textbooks contain much that is useful, teachers are the greatest experts in their own situations. No one is inside a crisis in exactly the way you are.

Very often teachers feel instinctively that a particular action is called for in a particular situation, but they refrain from following this instinct because it contradicts some commonly accepted theory. If you feel strongly that something is right, even though it goes against conventional wisdom, acknowledge your instincts and act upon them.

Sometimes you will find that your instincts are completely wrong and that you have seriously miscalculated the consequences of following them. If this happens, then you will probably have learned how to recognize when your instincts are well grounded in reality. But don't automatically shut them off the first time they make themselves felt in the belief that if they don't match theory then they must, by definition, be wrong.

### **Create Diversity**

Given the bewildering complexity of teaching and learning, a good rule of thumb is to use a diversity of materials and methods in your practice. This is important for two reasons. First, if you try out a range of materials and methods, there is a good chance that at some point in the activity the majority of students will find that their preferred learning style is being addressed. They will experience this as reassuring and affirming. Second, by introducing students to styles with which they are unfamiliar, you will be preparing them to flourish in a greater range of situations than would otherwise have been the case.

So, as you create diversity, try and mix visual with oral modes. Alternate small-group exercises with large-group plenaries. Provide options within assignments for independent study and for group projects. Try out experiential learning techniques such as simulation.

Be particularly careful not to fall into habitual teaching patterns that grow out of your preferred learning style. For example, my instinctive text dependence as a learner means that as a teacher I tend to under emphasize the use of visual aids and to forget the importance of depicting ideas graphically for students. Again, because I have a tendency to work independently on projects, I forget that many people much prefer working in teams and enjoy the interchange that sometimes seems a waste of time to me. So I have to make a conscious effort to remind myself to curb my tendency to

hasten group processes that are time-consuming.

Of course, the diversity you employ as a teacher will be constrained by organizational variables, by students' levels of learning readiness, and by your own familiarity with the methods and materials involved. You can't be expected to change your style at the drop of a hat, particularly if it involves doing things with which you have no experience or training or which contradict fundamental aspects of your personality.

### **Take Risks**

Good teachers take risks in the full knowledge that the risks will not always yield positive dividends. They are ready to depart from planned curricula and methods if the moment seems to dictate this. The more you take risks, the more adept you become at recognizing when they are justified and likely to pay off. In particular, the better you become at responding to true teachable moments – those times when an unexpected event excites the interest and energy of a group in a way that had not been planned.

When these moments occur, it is important to build on them and use them to greatest effect. Often what you thought would be supremely exciting activities will draw responses of studied indifference from students, so you cannot afford to let a true teachable moment slip away. Risking the exploration of unplanned and uncharted intellectual waters is often remembered by teachers and students as significant and exciting.

In this regard it is helpful to think of a good educational experience as being like a good conversation. Good conversations, by definition, cannot be predicted in advance. They are characterized by risk and spontaneity. If I knew what you were going to say before you said it, and if I could predict beforehand the turns my conversation with you would take, there would be no point in talking. Conversations characterized by this degree of predictability are experienced as forced and boring, and so is education.

### **Recognize the Emotionality of Learning**

Many textbooks and research reports use language and terminology that depict learning as an ascetic activity distinguished by rational inquiry. There are a few recognizable flesh-and-blood human beings and little indication of the visceral ebbs and flows that accompany, and are intermingled with, the activity of learning. Yet, as students themselves report, learning is emotional. It involves threats to students' self-esteem, especially when they are exploring new and difficult knowledge and skill domains. Even when they experience forward movement, there is likely to be an emotional resistance for giving up old assumptions. The emotional sustenance students receive from a supportive learning community is crucial to their survival and success in undergraduate school.

Being aware of the emotionality of learning is important for your practice. This awareness will help prepare you for the inevitable outpouring of anger and

resentment that for some students accompanies the exploration of new intellectual areas. The study of the principles of aircrew resource management is an example of a relatively new intellectual area. You will also be less likely to experience an angst-ridden scrutiny of your own apparent shortcomings, just because a student greets your activities with hostility rather than love. You will not rush to stem the process of grieving for old assumptions and identities but will see this as a natural accompaniment to change. You will also allow time for the expression of emotions that, if repressed, would fester until they represented a much larger block to learning than need be the case.

### **Acknowledge Your Personality**

One of the characteristics that students value most in teachers is authenticity. If you teach in a way that belies fundamental aspects of your personality, you will come across as stilted and unauthentic. In particular, if you are introverted, quiet, and reflective, you should not try to pass yourself off as the andragogic equivalent of Groucho Marx. Many students will feel much more comfortable with you than with an outgoing, broadly gesturing extrovert. Also, the most charismatic of teachers can sometimes inhibit students as well as inspire them.

If you feel uncomfortable about behaving in a certain way, you should probably acknowledge to students and colleagues that this is the case. Be wary of becoming obsessed with exemplifying idealized behaviors that don't come naturally. For example, I find listening

to students' questions and responding fully to these to be very hard work requiring great concentration. To answer a complex question clearly, I need to focus on my internal mental processes, almost to the exclusion of everything else. This means that I have no energy or inclination left to spend on making eye contact with people around the room. So when I'm listening to a question, I tend to look only at the questioner. When I answer a question, I will stare at the floor or look out a window.

I recognize that in terms of "proper" classroom communication this is a terrible thing to do. But I also know that if I'm to give a clear, articulate response to a question, it is crucial for me to stop worrying about making eye contact with all the students in the room. Were I to become obsessed with constantly rotating my head from left to right, right to left, around the room, I would likely give a confused response. So I will begin sessions with new groups by saying that I find it difficult to think and look at the same time, so they should not interpret my staring into space as implying ignorance of their existence. In fact, it implies serious recognition of their existence, since it means I am struggling to understand their questions as fully as possible and to give the clearest answers I can.

### **Don't Evaluate Only by Students' Satisfaction**

Most of us go into teaching inspired by a desire to help others. We often expect to be respected or admired by our students for our altruism. We

may not always be aware of this expectation, but for many people it constitutes a powerful assumption that is implicit in much of their practice. One consequence of this assumption is that when students greet our efforts with anger and resentment, we immediately conclude that we have somehow failed.

Hostile student evaluations of our practice are often granted a credibility far greater than is actually merited. Please recall that students report many significant learning episodes involve pain, anxiety, and challenge. While these episodes are being experienced they may inspire resentment in students against the apparent cause of these emotions, that is, against you, the teacher. Knowing that the expression of such hostility might be interpreted as a sign of your andragogic competence as much as a sign of your inadequacy is an important defense against the debilitating depression that often accompanies receiving a poor evaluation.

### **Balance Support and Challenge**

Of all the intractable dilemmas college teachers face in their practice, balancing support and challenge is one of the most problematic. Striving to achieve an equilibrium (ever-changing though this may be) between these two forces is crucial. The fundamental underpinning of all your actions as a teacher should be a respect for and affirmation of your students. If students feel they are in a hostile or indifferent environment, their commitment to learning will be seriously weakened. They may be

physically present, but they will be mentally absent. Also, receiving only criticism from teachers is experienced as psychologically devastating.

Keep in mind the fragile egos of your students and acknowledge the effort they have made, even if this effort has not produced the quality of work you would hope for. Remember that in their eyes your pronouncements carry enormous weight, and that a critical side from you may be recalled for months, even years, as a wounding experience. Leaven every oral and written criticism with praise, if at all possible.

But if students experience only affirmation and never challenge, then their encounter with you is not truly educational. Affirmation may be an important precondition of challenge, but it can never be considered the sum total of teaching. Without challenge, some students will never explore alternative perspectives, venture into new skill areas, or appraise critically the accuracy and validity of the habitual assumptions underlying their reasoning. Yet all these activities are central to developing the critical thinking that is the fundamental purpose of college teaching across disciplines and contexts.

Achieving the right balance between challenge and support is difficult enough with one person in one task, let alone with a group of students pursuing multifarious activities. If you have to err on one side of the support-challenge equilibrium, err on the supportive side. When students receive affirmation from teachers whom they perceive as authority figures, the effect is astonishing. It is unfortunate, but true,

that many students will only take their own ideas seriously after a teacher has validated them. By listening to and acknowledging students' voices, teachers can strengthen the shaky self-confidence of diffident learners.

As Daloz (1988) remarks, to encourage learning means, literally, to encourage, to nurture in learners the strengths and fortitude to confront what, to many, is a perilous and threatening journey. Since critical thinking represents such a journey for many students, they need to muster beforehand a formidable degree of courage, conviction, and strength. A period of support often provides the confidence that allows students to embark on this journey. Challenging conventional wisdom and questioning previously accepted givens are intimidating prospects to students who have internalized the belief that their insights, skills, and experiences are not as valuable as the "official," "proper" knowledge contained in books and teachers' heads. So, your affirmation of students can lay the psychological groundwork for subsequent critical thinking episodes.

#### **Recognize the Significance of Your Actions**

Your actions are imbued with enormous symbolic significance by students. When it comes to the most crucial emotional interaction of all between teachers and students – that of building trust – teachers' actions count more than anything else. If your words and actions are seriously discrepant, then an air of artificiality will permeate the

encounter.

Don't fool yourself into believing that merely by saying to students that you are all equal will make them view you as one of them. You can never escape the fact that your actions will be closely scrutinized for the messages students think they contain. Initiating a discussion and then staying silent, for example, will be perceived as a significant action by students. They will ascribe all kinds of purposes to your silence and worry about the critical judgments that inform it. As Freire says, "education is above all the giving of examples through actions" (Shor and Friere, 1987, p. 160). Knowing this, you can make a virtue of necessity and ensure that your actions model the kinds of intellectually demanding yet respectful behaviors you are seeking to encourage in students.

### **View Yourself as a Helper of Learning**

The fundamental reason for teaching is to help someone learn something. Anything you do that contributes to this purpose is skillful teaching, no matter how much it may depart from your traditional expectations how teachers are supposed to behave. Anything you do that inhibits learning, no matter how much it exemplifies traditional expectations, should be diminished or stopped. You have to make a judgment concerning what is realistic in this regard. For example, even if you feel that examinations inhibit rather than enhance learning, you generally can't avoid giving them. But,

when you reflect on your skill as a teacher, there is only one fundamental question you need to ask: Are my actions helping students learn?

Knowing that this is the fundamental criterion by which your efforts should be judged means that you can regard as skillful teaching many activities that fall well outside the traditional model of the teacher as a charismatic performer. Being able to help students diagnose their difficulties within an area of study can be a very skillful teaching act, since understanding accurately the nature of these difficulties is crucial to addressing them. A teacher who arranges individual counseling with students to enhance their self-esteem or one who puts students in touch with others who have similar enthusiasm is also teaching effectively.

### **Conclusion**

Don't trust what you've just read. What for me are truths of skillful teaching may, for you, be partially or entirely inappropriate. Keep in mind that in the time between writing this paper and its publication I may have amended some of these truths, deleted others, and added still more. My continuing journey as a teacher through diverse contexts and dilemmas is bound to generate new insights. For me to end this paper claiming to offer a decontextualized, standardized package of teaching truths would be to contradict the critically reflective skepticism about such injunctions that I have been urging throughout the paper.

In conclusion, listen to your

nagging, inner voice. Be prepared to admit the possibility that your inner voice is right, even when all professional wisdom runs to the contrary. Be ready to act on what your inner voice tells you, all the time knowing that periodically making mistakes is endemic to good teaching.

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**Accelerated Learning Techniques for Adults---  
An Instructional Design Concept for the Next Decade**

**by**

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**Abstract**

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Title: ACCELERATED LEARNING TECHNIQUES FOR ADULTS---  
An Instructional Design Concept for the Next Decade

This paper focuses on accelerated learning for the adult student as a process and a specific model of techniques. The model focuses on the “whole” student including the emotional and intellect aspects of learning. Specific techniques are illustrated to incorporate a variety of accelerated teaching methods used to stimulate sight, sound, and hands-on learning.

Preparation and delivery methods focus on use of association with the whole brain learning process. Traditional note taking is contracted with the new method of mind maps. Music for accelerated learning is illustrated. The pygmillian effect is incorporated with team work which is the most important new skill. Guided imagery as a instructional method is presented to combine words and images in the learning process.

## **ACCELERATED LEARNING TECHNIQUES FOR ADULTS --- An Instructional Design Concept for the Next Decade**

As educators we are continuously faced with the dilemma: how to reduce instructional time and provide more learning and better learning experiences for our students.

The answer to this challenge comes from applying the principles and techniques of accelerated learning in our instructional methodology. Accelerated learning techniques can cut training time virtually in half while measurably improving learning and job performance for our students.

The adult student working full-time, raising a family, and attending classes many times is physically tired and mentally drained. For students to learn and keep interest during an extended class which may be 4 and 5 hours long, the learning model should incorporate new techniques other than the traditional lecture methods. By using the many new theories and instructional techniques in the field of accelerating learning and brain/mind research, marketing educators can begin to communicate more effectively to adult students and increase their potential genius.

This article considers accelerated learning as a process and philosophy of learning. The discussion presents an accelerated learning model, principles of the method, and techniques for preparation, delivery and practice of techniques.

### Definitions of Accelerate

1. to bring about at an earlier point in time
2. to add to the speed of
3. to hasten the ordinary progress or development
4. to enable a student to learn more in less time

### Accelerated Learning Defined

*Accelerated learning is a method of instruction that provides an atmosphere where students are able to absorb and retain concepts by overcoming traditional barriers of learning (McKeon, p.64).*

The accelerated technique stems from the belief that traditional methods are not always effective.

*The approach was introduced by Bulgarian psychiatrist Georgi Lozanov who called it 'suggestopedia' or 'suggestology.' First applied to the learning of a foreign language, accelerated learning focuses on the role of the subconscious in the acquisition of knowledge. Lozanov demonstrated that 'superliminal' instruction can stimulate the brain's right hemisphere, thus significantly increasing learning efficiency and improving information retention. This approach has been modified over time and has found numerous applications beyond language learning. Today, it is a multi method, multimedia learning technique that*

*combines instructional games, highly physical learner involvement, metaphorical activities and background music (Zemke, p.93).*

Accelerated learning is a process of fine tuning the traditional instructor with application of instructional delivery technologies. The natural mind is designed for accelerated learning.

### Benefits

When applied in a concentrated format, accelerated learning techniques can reduce traditional classroom time by more than 50 percent. The time and resources gained with accelerated learning can be reinvested in the design and delivery of additional material. In addition, the accelerated learning technique also works with individualized instruction. The author created a Peak Performance Academic Counseling Service for improving learning for students. During a 5-year period, almost every client reached new levels of learning mastery and achieved top performance in test scores spending less time. Accelerated learning is a multidimensional approach where learners are in direct control of what they are learning.

The benefits include increased learning in less time, with less effort, and with a more enjoyable experience than the traditional learning model.

### Philosophy

As a member of the National Accelerated Learning Network we believe:

Learning should be fun; it should never be boring, threatening or judgmental. Also, learning should be global. This means the instruction should engage the whole student on all levels: intellectually, emotionally, kinesthetically, consciously, and sub-consciously (Center for Accelerated Learning).

The challenge is to understand the new student learner and apply a new learning environment. The traditional learning method cannot do enough for information age students. An instructor must move from pedagogy to androgogy to wholegogy. Learning how to learn is today's top priority, a shift from linear methodology to geodesic thinking.

*But now we're into something else: the geodesic age. It's an age that takes as its symbol the geodesic sphere - an interlocking network that suggests integration, interrelationship and a sense of the whole. Now our belief systems, our ideas about human personality, our organization development activities, our scientific endeavors and our educational philosophies are beginning to reflect this new interconnected model (Meier, p.40).*

A comparison of the traditional and accelerated method follows.

**TRADITIONAL  
LEARNING  
tends to:**

emphasize separateness  
confuse uniformity with unity  
trivialize the individual  
dull the creative  
be EITHER/OR  
emphasize ONE BEST WAY  
be competitive  
restrict  
block human energy  
be static & rigid  
be linear & hierarchical  
be single-pathed  
feel unnatural  
be audio/visual  
be hard work  
be a process

**ACCELERATED  
LEARNING  
tends to:**

emphasize wholeness  
welcome diversity  
exalt the individual  
nurture creativity  
be BOTH/AND  
be purposefully eclectic  
be collaborative  
liberate  
release human energy  
be dynamic & flexible  
be geodesic & mutual  
be multi-pathed  
feel natural  
be multi-sensory  
be joyful  
be a state of mind

**THE ACCELERATED LEARNING MODEL**

All the individual components below form an interlinking whole. Each component affect each other and the whole. With all components working together, the whole becomes significantly more than the sum of its parts.

PREPARATION	PRESENTATION	PRACTICE
<p><b>GOALS:</b> High, Specific, Clear, and Meaningful. Help learner clarify goals. Connect these goals with the goals of the course, the organization, and the learner's total life.</p> <p><b>SET:</b> Set the minds of your learners for high achievement and a happy learning experience.</p> <p><b>SETTING:</b> A comfortable, pleasant environment rich in positive feelings.</p> <p><b>TEACHER'S MENTAL PREPARATION:</b> Subject matter competence. Creativity &amp; Imagination. Genuine care for the learners.</p> <p><b>POSITIVE SUGGESTION:</b> Verbal and non-verbal. Pervades all components.</p> <p><b>MIND/BODY RELAXATION:</b> Creates openness and fosters whole-brain learning.</p>	<p><b>PREVIEW:</b> Synthesis, global overview, key words, key concept, the whole before the parts.</p> <p><b>PRESENTATION:</b> Attractive materials. Action, emotion, drama. Humor and playfulness. High participation. Geodesic &amp; multi-pathed. An adult Sesame Street. Colorful &amp; imaginative.</p> <p><b>COLLABORATION:</b> Cooperation &amp; teamwork. Everyone a teacher and a learner simultaneously. All for one &amp; one for all. Team-based teaching/learning. Non-competitive mutuality.</p> <p><b>REVIEW:</b> Synthesis, repetition, clarification (where needed), expansion, seeing connections.</p>	<p><b>HANDS-ON PRACTICE:</b> Individual and team-based. Geodesic &amp; multi-pathed. Integrative. Playful, yet practical.</p> <p><b>APPLICATION BUILDING:</b> Immediate usefulness. Individual or team-based. Practical payoffs.</p> <p><b>ELABORATION:</b> Problem solving. Student presentations. Student teaching. Manual skills practice.</p> <p><b>POST-CLASS FOLLOW-UP:</b> User groups &amp; newsletters. Post-class update meetings. Personal visits. Students teaching.</p>

Source: The Center for Accelerated Learning

## Accelerated Learning Principles

### Environment for Learning

1. Create a classroom setting that is colorful, comfortable, and naturally stimulating.
2. Create an environment to get the fun (and success) back into learning rather than the seriousness.
3. Create an environment which helps students eliminate or reduce any fears, stress, or learning barriers they might have.
4. Create an environment which is collaborative and mutually supportive rather than driven by traditional parent-child assumptions about instruction.

*The first step is to get the student to forget to look out the window.*

Our students deserve the best possible learning environment. Every student likes a learning area like a living-room that is roomy, that has attractive soft colors, plenty of lighting on a dimmer switch, a comfortable chair, and a temperature that does not exceed 68 degrees. This type of environment is necessary in order to maximize learning. Now include a stereo, flowers, plenty of colored pens, flipcharts, 3M pads, and food. This environment stimulates the student's mind and contributes to maximum learning. Learning is greatly strengthened by creating an appropriate environment to maximize the mind of the student.

Room arrangement directly affects the ability of students to learn. The circle or U shaped, is designed for interaction of students. The lecture design (Prussian

model) or parent/child model where all students face the instructor is not appropriate for the accelerated student learner.

## Preparation for Accelerating Learning

All genius learning is active not passive, and it uses both sides of the brain. Many creative techniques can be used in a variety of ways for presenting traditional course material.

The following includes some ideas for accommodating students various styles of learning and interests to master, manipulate, and enjoy bodies of knowledge.

Acrostics	Models
Brainstorming	News articles
Buzz groups	Networking Party
Case histories	Objects/Objects lessons
Chalkboards/whiteboards	Overhead transparencies
with color	in color
Charts	Panels of students or executives
Data show presentation	Picture studies
Debate	Problem solving
Demonstration	Project teams
Discussion-student lead	Quiz
Field trips	Question & answer session
Films/video	Reports
Flannelgraph	Review in game format
Games/crossword puzzles	Role-playing
Imagery	Skits
Interview in class or field	Song simulations
Internet presentation	Storytelling
Maps	Symposiums & Forums
Memorization games	TV presentation
Mind-Mapping	Visualizations
Mnemonic systems	

### Adults enjoy a lot of variety in the classroom

Instructors must use a variety of teaching styles because adults learn in a variety of ways. Many adult students have not discovered they have a personal style of learning that can be used to motivate and accelerate, their learning process. Once students know their best learning style they can take advantage of this strength in the learning process.

In an ideal learning environment, the pace and teaching style should change every 20 minutes. Adults learn best when they are active, so they should have input and decisions about what, where, when, how, and why to learn. If everything a student really wants to do is forbidden or unavailable, boredom will permeate the classroom.

### Delivery of Dynamic Presentations

1. Develop a learner-centered approach rather than teacher-centered approach.
2. Create a presentation which provides a multi-pathed and multi-dimensional approach to learning.
3. Develop a presentation with a variety of different learning styles, speeds, and needs, rather than force students to produce in an assembly line at a uniform speed rate
4. Implement a variety of presentation techniques to present material pictorially

as well as verbally.

5. Incorporate mental imagery to significantly improve knowledge and skill of acquisition learning.
6. Use the power of positive suggestion for a positive and accepting presentation.
7. Organize an environment to promote student group learning in teams of two, three, and more.
8. Implement an environment that provides students with plenty of time for learner articulation.

### Use Association with the Whole Brain in the Learning Process

As educators we know the need to express new ideas in terms of what the student already knows. This technique is known as association. By knowing the differences between the right-brain mode (creative) and the left-brain mode (logical), we can effectively communicate to both sides of the student's brain. Psychologists have proved to us that half the people in America are left-brained, influenced by logical, sequential reasoning. The other half are right-brained, influenced by emotional, aesthetic appeals. The real figures are 45 percent left-brained, 45 percent right-brained, and 10 percent have a balanced-brained. Since most instructional methods focus on left-brain activities, they miss the mark with the majority of right brain students.

The human brain thinks about four times as fast as the tongue can speak. That huge

gap provides the time for distracting thoughts - for mind wandering (Lorayne, 1994 p.29). The way to avoid the mind wandering is to fill in that time gap with left- and right-brain learning activities. In accelerated learning this technique brings items or sequences together in an imaginary way. The imagination of the student associates the words to be learned with a descriptive story which can be easily recalled using both reasoning (left brain) and an emotional approach (right brain).

*In order for you to remember any new thing, it must be associated with something you already know or remember (Lorayne, 1990 p.12).*

An association example should be extreme or humorous so it can implant the idea firmly in the mind of the student. Every new fact or concept you learn adds to and links up with the existing network (Rose p. 59). Association works best when the imaginary story involves an emotional and reasoning appeal.

### Traditional Notetaking

The subject of notetaking is seldom studied or explained in the classroom. Most notetaking is a system to forget what was learned rather than to remember. We do not remember key sentences.

The purpose of taking notes is more than simple storage of material for recall. It helps the student encode the information, organize the material, develop associations

and interpretations, and bring attention to what is important.

When we learned how to speak, we matched key words first. We also use this process when we learn a foreign language. A study by Michael Howe at Exeter University examined students' notes to determine the ratio of key words to non-key words present in the notes; the higher the ratio the better was the recall (Howe). Items that were noted were six times as likely to be remembered as items that were not written down.

### Mind Maps

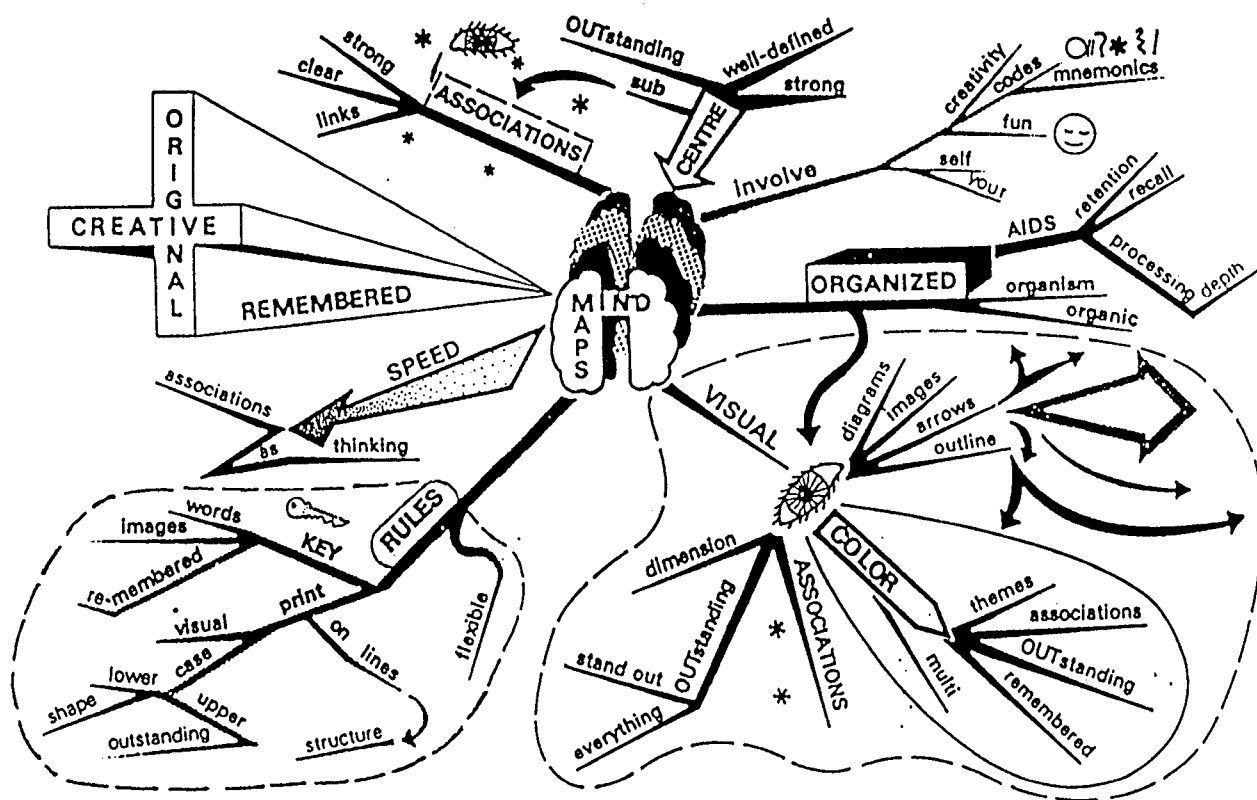
Mind maps encourage note taking in visual patterns rather than a linear form for recall. This new tool for adult notetaking facilitates memory by using visual associations and diagrams of key words.

Since visual images are easier to recall than words, the more pictures drawn the better is the recall. Colored pens are used to stimulate the brain. A mind map works in the same way the brain works. Once the mind map is constructed the concept has a greater impact on the memory of the brain. Symbols speak louder than words.

Organization of notes begins by structure of a tree line for main concepts and branches follow for subheading of key words. Key words are used because the brain drops the non-essentials. Association recalls words and ideas that work together. The center of the page has a strong visual image with a pattern drawn with associated items connected with it. A mind map may have

several subclusters radiating from it or subcenters. The best review for a class is doing a mind map. Mind maps can be used with any lecture, meeting report, or study task (Figure 1).

Figure 1



Russell, Peter (1984). *The Brain Book*. New York: E.P. Dutton, p. 181.

## Music for Accelerated Learning

Humans are rhythmic beings. Sounds and rhythms can motivate and directly effect learning. According to the French researcher Mme. Belanger, playing Mozart "coordinates breathing, cardiovascular rhythm, and brainwave rhythm and leads to positive effects on health. It acts on the subconscious, stimulating receptivity and perception." Synchronized music and rhythm is one of the basic secrets of accelerated learning. The music when paced at 60 beats per minute is perceived by a person as being slower than it actually is. As a result of this retarded time perception, a large number of mental and creative activities can be accomplished in very little clock time, because time itself actually seems to expand.

The following types of music can enhance particular activities:

### CONTEMPORARY MUSIC (for imagery & reflection)

Comfort Zone or Spectrum Suite by Steven Halpern. Sound Health Research Institute.  
PO Box 1551, San Anselmo, CA 94960.

Gregorian Chant - Salesmen

Natural Light. Steven Halpern & Dallas Smith. Sound Health Research Institute.  
PO Box 2644, San Anselmo, CA 94979-2644.

You Are the Ocean. Schawkie Roth. ISEN 0-031245-01-X. Vital Body Marketing Co.,  
42 Orchard St., Manhasset, NY 11030.

### BAROQUE MUSIC (for a sense of well-being, learning and relaxed receptivity)

Adagio in G Minor for Strings & Organ - Albinoni, Tomeso

Beethoven's Emperor Concerto for Piano. Greatest Hits of 1720. Columbia  
Masterworks MX 34544.

Brahm's Violin Concerto in D Major. Greatest Hits of 1720. Columbia Masterworks MX  
34544.

Brandenberg Concertos - Bach

The Pachelbel Cannon and Other Baroque Favorites. Toronto Chamber Orchestra.  
MMG Records, D-MMG 112.

Handel Organ Concertos.

George Malcolm with the Orchestra of St. Martin in the Fields. Argo Records, ZRG 888.  
The Rage of 1710. Vox Turnabout, TV 34713.

Tchaikowsky's Piano Concerto in B flat Minor.

Water Music Suite and Royal Fireworks Suite - Handel.

CONTEMPORARY MUSIC FOR RELAXATION & ENERGIZING

Down to the Moon - Andreas Vollenweider, CBS FMT 42255.

Excerpts from Fresh Aire IV & V.

Journeys by David Arkenstone. Ellipse Production. Salt Lake City, UT 84101.

Mountain Dance. Dave Grusin. Arista Records.

Soundtrack from Flashdance

Various Records by Dave Beniot: Can You Imagine, Stages, Freedom at Midnight.

Windham Hill Sampler. Windham Hill Records, WH-1048.

Wishful Thinking. Earl Klugh. Capital ST-12323.

Fast and traditional jazz music will also work well.

The Pygmillian Effect - The Self-fulfilling Prophecy

Considerable research proves that the human mind does only what it thinks it can do. The expectation of the learner suggested by the instructor is a powerful accelerated learning tool. If the student believes the class is ordinary or easy to accomplish, the student fulfills that expectation. Everything must be stated in a positive and challenging manner in order for students to reach new levels of expectation. Positive statements are essential to believe in to achieve the higher levels of learning.

For accelerated learning to happen students must be prepared for unusual and different approaches at the start of the course. They must know this will be a new and enjoyable experience. Trust and confidence building between the student and the instructor are essential ingredients. Some students may be cynical no matter what the instructional technique may be. The instructor must explain each exercise and encourage questions. Allowing the students

to discuss their doubts is part of the technique. Their agreement to go forward is important in developing new approaches to accelerate learning.

Teamwork - The Most Important New Skill

One of our most neglected resources for adult learning is other people. Most schooling is individualistic but not individualized. We were conditioned to learn alone with collaboration usually considered as "cheating." Making the best use of other people is an essential part of accelerated learning.

A study by David Michaelson & Association found that more than 90 percent of American workers have some exposure to working in a team. Those workers spend an average of 61.5 percent of their work time in a team environment. However, only 50 percent of these workers say they've had any formal training on how to work in a team. Working effectively on teams is the most important new skill MBA's should have,

according to the CEOs polled in Fortune's recent survey (O'Reilly, p. 40).

The emergence of the knowledge-based economy requires managers to learn how to act as 'coaches'.

*They are supposed to provide resources, eradicate obstacles and protect the well-being of work teams to enable them to learn, solve problems and improve their effectiveness (Olalla, p.16).*

The learning area must be designed for student teams to work together in groups. Group learning activities should be part of the learning design for every class.

### Guided Imagery Techniques

The instructional method must help students learn to combine words and images to create a positive mental climate for accelerated growth and development. The ability of the human mind to visualize things real and imagined is a tool which will help retain learning. The learning objective is to transfer short- term memories into long-term habits through practice and application.

Many of the mnemonics (memory aids) use a form of guided imagery. Using this technique to create humorous and almost wild images provides a change of pace in instruction. This change provides a direct association to new information which will accelerate the learning process.

The students' imagination can be used to allow the student to experience things not possible in the typical traditional classroom. The student has had the experience of being guided by their instructor and now can go anywhere and observe almost anything under

any condition using interactive imagery. The concept is to present a visual simulation without actually doing it.

Some Uses of Imagery Include:

- Learning a Process
- Rehearsing an Event
- Practicing a Skill
- Defining Problems
- Solving Problems
- Clarifying Values
- Establishing Goals
- Changing Attitudes

Many studies have shown that the internal abilities of the human mind are infinite. Students need to discover their own awareness of the subject from within their minds (Aristotle).

A study investigated the importance of vividness in imagery and found when the images were vague and indistinct, recall was around 70 percent. This is much higher than learning gained by rote repetition. When the examples were "seen" vividly and distinctly, as if they were real, recall was around 95 percent (Gregg, p.67).

The human brain cannot distinguish between what is real and what may be imagined. Athletes have used mental rehearsal techniques to prepare for physical competition without physical practice with incredible results. Mental rehearsal will increase learning in the classroom.

## Conclusion

We are just beginning to learn what the infinite power of the mind can do. When we add a proper environment with a large variety of techniques we find learning is a fun and an enjoyable experience.

Accelerated learning has a focus on the "Whole" student being involved in the learning process. This approach challenges the instructor to involve all the parts of the human being known as the "student." The focus includes the conscious, subconscious, logical, emotional, verbal and pictorial aspects available to us as instructors. We can help the student learn more material faster and more completely. We know the power of using sounds, sight, taste, smell, and feelings to stimulate a response. By using these senses to stimulate the emotions of the learner the student will learn faster, use less effort, and have more fun in the process.

One of the most powerful learning accelerators is the awareness that students discover the learning themselves. Using a variety of exercises and techniques which allow for self-discovery will motivate the student to want more.

Accelerated learning as a methodology and technique will help stimulate the imagination of the student to discovering new truths. The method can invest new approaches to learn the same old subjects, so the instructor will enjoy teaching more with a greater return on time and energy.

The benefits include more response among all students and not just another boring class. The student will know the

instructor really cares about the "whole person." These techniques help reduce instructor stress and burnout which can happen to any instructor. Our challenge as instructors is to help the student learn more faster, easier, with greater retention. Accelerated learning is the method, and it is fun for both the instructor and student. We can help our students become world class experts and gurus in our field if we are willing to change our thinking on how our students learn.

Will Rogers once stated "Even if you're on the right track, you'll get run over if you just sit there." The time for accelerated learning techniques in the classroom is now and in the next decade.

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***EDUCATION TAILOR-MADE FOR THE TIMES***

by

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**Education Tailor-Made for the Times**

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**Abstract**

The computer in the classroom and computing in the curriculum are the impetus for major changes in higher education during the next decade. The changes needed in the curriculum and in the concepts and practices of instructional delivery, though accepted by most, will be considered radical and unorthodox by some and academic heresy by others.

Prescribing a certain amount of contact time between the teacher and the learner as a requirement for the award of a corresponding number of academic credits will be reconsidered and redefined. There is no longer a need for this artificial barrier to educational advancement.

The textbook will no longer be viewed as 'the' source of knowledge on some certain subjects and going through the text from cover to cover at a certain pace will no longer be considered the only logical sequence for acquiring the requisite knowledge.

Emerging concepts and complex subjects, along with multidimensional processes and systems, will be presented in forms which will achieve the greatest measure of clarity and understanding. Some of the needed forms do not currently exist. The major purpose of computing is going to be to provide insight through visualization.

The instructor is going to need new skills. The traditional subject matter expert is going to be inadequate. The teacher is going to facilitate the students' link to the deluge of words and images of every imaginable kind from literally around the world and do it all hours of the day and night. The teacher who thinks he or she is in the business of fifty-minute lectures will still be in that business ten years from now.

## **Education Tailor-Made for the Times**

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### **Introduction**

When considering a list of the largest companies in America at the turn of the 20th century, one can see that ten of the largest twelve were natural resource companies. Our economy was a natural resource economy. Wherever the most highly needed resources were found, job opportunities followed (Thurow, 1996).

To examine the equivalent list as we approach the turn of the next century, one would now see that the leaders are microelectronic biotech, telecommunications, aircraft manufacturing, and computer hardware and software. All of them are brainpower industries that can be located anywhere on the face of the earth. Where they will actually locate and flourish depends on who organizes the brainpower to capture them. Who it is that will organize the brainpower most effectively and efficiently depends on who it is that educates best toward that objective.

A clear majority of the radical innovations (inventions) of the last two decades have been by Americans, yet when it comes to sales, employment, and profits, all of these inventions have become Japanese products. The Japanese did not invent any of them. Radical innovation, if the innovator is not also the low-cost, quality producer, gives the inventor very little economic and/or competitive advantage. Of course, being the low-cost producer is partly

a matter of wages. To a much greater extent, it is a matter of having the skills to do things better--to make incremental innovation.

The global economy is a dynamic economy. It is always in transition. What is not changing is being passed by. The organizations that are, and will continue to do best are those able to move from process to process and service to service within technological families so quickly that they can always keep up with, and ahead of each new generation of technology.

If an organization wants to attain and stay at the leading edge of technology, it must be a participant and partner in the evolutionary progress of 'brainpower'. Knowledge has clearly become the only source of strategic sustainable competitive advantages. The rates of return for industries that invest in skills and knowledge are more than twice that of industries that concentrate on plant and equipment (Thurow, 1996). Industries' skills-and-knowledge investment will be made when and where they have been satisfied they will get the best return. If firms are to locate their top-skill, top-wage jobs in the United States, it will be because the US offers them the lowest-cost, highest-quality opportunity to develop those skills and knowledge. If America's educational system is not competitive in this environment, the market will simply move on.

The skills and knowledge required in the global economy of the next century will be radically different from those required in the past. The people who do acquire those skills and knowledge may or may not be the young and/or the unskilled workers who currently live in this country. Equal to the ability to make anything any where in the world and to sell it anywhere else in the world, is going to become the ability to teach skills and knowledge to anyone, anywhere, and at anytime. Investment will be made in the process that provides the world-class graduate. Educational defects of the graduate are not the problem of industry. They will simply go with the process that gives them a graduate with the necessary market skills. The American worker will have no advantage at the turn of the century if it is not in the skills and knowledge needed to create radical and incremental innovations. If these are not provided by the educational institutions of this country, multinational companies will find them wherever it is in the world that best suits their economic needs.

Instruction and instructional technology need to create and organize the 'brainpower' necessary to make us masters of new production and distribution technologies, radical and incremental innovation, and the strategic consequences of both. This is not going to happen by teaching the same things we have been. There are answers. We need to give them the appropriate priority.

Nothing has so revolutionized the way we do things, the very 'academic way of life', more than the development of computers. Educational institutions, administrative functions aside, have been

slow to use computers, computing, and the associate emerging technologies to their fullest advantage. Now that they are realizing the necessity of doing so, these academic institutions must make a serious attempt to 'catch up' with advancing technology.

This is going to require the development of a new attitude throughout academia. A critical ingredient of this new attitude is an openness to, and the acceptance of change. There are changes needed in the curriculum and in the concepts and practices of instructional delivery. These changes, though accepted by many, will be considered radical and unorthodox by some, and academic heresy by others. Nonetheless, what might prove to be an uphill battle will have to be fought. And, it will be won by those who are committed to that vision of where it is that higher education needs to be in the decade. The teacher who thinks he or she is in the business of fifty-minute lectures will still be in that business ten years from now (Walker, 1996).

### **Contact Time**

One of the most firmly entrenched practices in today's higher education environment is that of directly equating a definitive amount of contact time between faculty and students with the specific number of academic credits (semester or quarter hours) to be awarded for a given course. This is, in essence, the 'Carnegie Unit'.

When the Commission on Higher Education recommended the universal

adoption of this system, the intended purpose was to standardize requirements for the award of academic credit (Nagel, et al, 1992). Standardization, it was felt, was needed. At issue is the appropriateness of the particular response. It was argued decades ago; it is argued now; and I will argue against its appropriateness for the next decade.

Academic terms of specified lengths facilitate the administration of students, faculty, and learning resource support, but do they support teaching and learning outcomes? Is there even a meaningful relationship between the amount of time spent together by faculty and students and teaching/learning outcomes? The faculty member who thinks there is might be flattering him or herself. Common knowledge suggests there is some relationship between the direction and focus provided by faculty and the student outcomes. However, there is a statistically significant relationship between student effort and measured outcomes that is independent of faculty/student contact time (Nagel, et al, 1992). Isn't student competency what it is about? Dare I suggest that is the total of what it is about.

One 'change' just starting to take place but that will gain noticeable momentum during the next decade is the 'downsizing' of direct contact time and the resurgence of competency-based instruction. All the pedagogical jargon aside, competency-based instruction is not much more than a high-sounding collection of words that simply means a flexible, individualized program that frees both the professor and the student to work at their own pace and to do so without the fear of

failure (Nagel, et al, 1992). Making use of specified performance objectives, or student outcomes, it is possible to take a text, a series of books, and a local or national curriculum and develop a program of instructional objectives that will meet the needs and desires of both the teacher and the students--each one of the students.

Competency-based instruction (CBI) is not new. Developments of the next decade will, no doubt, pave the way for the computer to become the tool that proves CBI to be both effective and efficient. It will make its use practical for both the academician and the administrator. Competency-based instruction and computer-based instruction will become synonymous or, at the very least, interchangeable.

The administrative staff at the university of the next decade is going to have to accept replacing this time constraint that academia is tied to by nothing other than tradition and standardization. The only way an academic institution is going to be able to establish/enhance its reputation as a cutting edge provider of technology education is to use those very technologies that are part of the curriculum and put them into practice in the administrative offices. Being able to process applications, registrations, and evaluations at a rate commensurate with the individual learning pace is the only acceptable response. The staff's need for specific start and stop dates as an administrative convenience will be replaced by the students' need to advance in their studies as their abilities allow. There is no need for artificial pedagogical or administrative barriers to educational advancement (Suchan, et al, 1995).

## **LEARNING-RESOURCE BASED INSTRUCTION**

In the middle of the fifteenth century Gutenberg changed the course of educational history. With the invention of movable type he made it possible to print books accurately, efficiently, and automatically (Aukstakalnis, et al, 1996). Within 25 years, books that were once only available to nobility and the clergy could be had by anyone able to pay, or trade, for them. 'How to' books soon overshadowed the esoteric tomes and religious texts that once dominated the market. For the first time, skills and information were transmitted, on an ever-increasing scale, without personal contact, revolutionizing the spread of knowledge (Aukstakalnis, et al, 1996).

As educators, it is important to remember that the potential of Gutenberg's technology, his invention, was only unleashed because of a shift in what students were taught. It was once considered sufficient for students to be apprenticed and learn a skill. Gutenberg's innovation made teachers realize students would not be considered educated unless they were able to read.

Like those teachers, today it is imperative we provide our students with the tools they need to use the learning resources currently available to them. It is interesting to note how it is that introductory computer classes have not changed but it is even more interesting to note how they have changed. The computer hardware is indeed different but the basic cycle of input, process, output, and storage remains the same. The dramatic change is, and will continue to be, in how we have de-emphasized how the machine

works and how we are significantly increasing the emphasis on what it does. We have already seen the shift in focus from the programming techniques classes of the late '70's to classes on the use of productivity tools of the late 80's (Thomas, 1996).

Education is a dynamic field. Our definition of computer literacy, what it really is to know how to use a computer, must be constantly updated to fit a rapidly changing world. During the next ten years, the single, most widely used function of the computer will be as an entrance to the rest of the world, the World Wide Web. Like Gutenberg's printing press, the World Wide Web is a revolutionary advance in the transmission of knowledge. It allows access to learning resources on a scale never before dreamt of. This is evident in the large and quickly growing number of organizations and individuals who indicate 'more information can be obtained at [www.something](http://www.something)'.

Just as teachers acknowledged centuries ago the importance of reading to education, we must accept and pass on to our students that knowing how to access and use 'the web' is an essential component of computer literacy. Beyond this point, the ability to use 'web browser' software will be considered as much a part of literacy as knowing how to read a library card catalogue is today (Tennant, 1996).

Through the next decade, 'the web' should go from being an exciting element of an introductory computer course to being 'the source' of information for many courses and as a delivery tool for even more. The degree to which this can and should be done

is open to discussion and debate. By the end of the next decade, it will be decided.

### **THE 'LINEAR TYRANNY' OF THE TEXT**

Other than those rare instances when it is essential to follow a very specific instructional sequence for an extended period, there will be little evidence at the end of the next decade of the illogical notion that teaching and learning have to follow some predetermined course. Just as there are individualized methods of instruction, there are idiosyncratic paths to optimum learning.

The key to what is going to happen in this area in the next decade is to liberate learning from the 'linear tyranny' of a textbook where each chapter moves lockstep into the next (Herlehy, 1995). The paradigm will be to have access to a 'huge encyclopedic wall full of textbooks' and for the student to be able to go right to the information that is needed and to have it presented in multiple ways, with sound, with video, and with graphics or animation (Herlehy, 1993). The 'on-line' connection to learning-resource materials will change the textbook from being 'the' source of knowledge to being, at the very most, a point of departure for the learning process.

The interactive capability of the 'on-line' connection will easily be upgraded to provide instant feedback to a person's response to instruction. Because students respond independently, they will be given feedback independently.

Taking advantage of instructional

technology of the next decade will allow students to zig zag through a course, taking a little bit from one section of a course outline and more from another in a fashion that allows them to customize a course, indeed a program, to accommodate their idiosyncratic learning needs. It will let the student have a cursory view or in-depth knowledge of a subject, depending on what the need is.

### **L E A R N I N G   T H R O U G H V I S U A L I Z A T I O N**

The greatest challenge that has always faced the educator has been to present unknown theories and foreign concepts to students in ways which would achieve the greatest measure of clarity and understanding. This is going to be even more challenging in the next decade. Subjects and concepts studied will become increasingly complex and multidimensional. Multivariate processes, concurrent design and engineering activities, and biotechnic developments will necessitate a heretofore unheard of degree of multidimensional computer simulation and visualization not only to be economically successful but also to be taught and learned.

Computer simulations and visualization techniques are being used, and will become increasingly sophisticated in their use, in higher education as the tools that best communicate complex subjects and foreign concepts to students in a form which enables greater insight, a clearer understanding, and longer retention.

This process is usually referred to as

'visual thinking' and has foundation in accepted principles of cognitive psychology and visual-information processing. To create an accurate mental picture of some multidimensional concept or complex process, some form of input is needed with which to create a 'vision.' If the input is highly symbolic and/or esoteric, a 'bottleneck' forms (Aukstakalnis, et al, 1996). The information processing path to the brain is blocked because our preconscious must translate any input into some understandable form before it can be used by our conscious mind. It's only when information is presented in a recognizable form that it can be effectively studied and committed to conscious understanding (Aukstakalnis, et al, 1996).

With the development of hardware and software in the last decade and what will occur during the next decade, the ability to graphically represent highly complex processes or multidimensional concepts will dramatically enhance the educational process. A significant improvement in levels of understanding and awareness will be achieved.

Computers will be used in some capacity in almost all educational tracks. The development of the next decade will be visualization techniques. These techniques will expand well beyond the simulations of today into such things as the simulation of three-dimensional scenes on a standard, two-dimensional monitor and onto fully immersive, head-mounted and head-coupled displays (virtual reality) (Aukstakalnis, et al, 1996).

The accurate interpretations of these visual representations will certainly depend

on the interaction between teachers and learners. The process of arriving at solutions to visualization problems will be facilitated by the instructor. This will require specialized individuals using specialized hardware and software to achieve satisfying visualization results. The advantage of student involvement in the process is not inconsequential. Using visualization techniques in teaching encourages students to think in three dimensions when approaching a problem. They are not constrained by the visual parameters. They are more inclined to think 'outside the box.' Visualizations that can be created can be recreated again and again with differences in any variables that exist in either space or time (Aukstakalnis, et al, 1996).

Simulations and visualizations are going to create an explosion in creativity. This new range of teaching tools will create truly new ways of looking at the world around us and new ways of thinking and problem solving--transforming the educational process to one of insight through visualization.

#### **THE DIGITAL PROFESSOR**

The university instructor will need to acquire new skills. The traditional subject-matter specialist is going to be inadequate for the challenge. The called-for expertise will be in resource-based learning (Tennant, 1996). The teacher is going to facilitate the students' link to the deluge of words and images of every imaginable kind from literally around the world and do it all hours of the day and night.

The tools necessary to make a transforming change are already available. We can surmise many things about

technologies of the future and their effect on the teacher. However, if we only have a personal computer and access to the Internet, we have enough to begin revolutionizing higher education. We have the foundation in place for the building of the 'digital professor'.

We can create teaching tools interactive enough to let students seek them out and work with them at their own pace and when it is most convenient for them. The student can use an on-line service to review class sessions in as little as two or three minute segments instead of 50 minute lectures and also review them as many times as they want. It would be difficult to argue that to review in small segments directly from the professor's mouth is not better than attempting to decipher scribbled notes taken one to three-hour lectures (Tennant, 1996).

There are infrequently-taught and low-enrollment courses that are in danger of disappearing altogether. Many institutions have no qualified faculty to teach these courses (enrollments do not justify the position) and the department with the qualified faculty cannot give them the time to develop the courses in light of enrollments. If a college or university was willing to allow the initiative, a self-paced interactive instruction, with open discussions, recitations, and exercises could be made available on-line world-wide (there is no obstacle to doing so right now), a highly qualified faculty member could start a student in a program of instruction; monitor his or her progress through it; and do an outcomes assessment upon completion never having been face to face with the student (Finn, et al, 1996). For the 'nattering nabobs of negativism', it is being done right now

and on more than a trial basis.

If the 'digital professor' delivers high quality instruction via the electronic network, we will do ourselves a favor by getting more students; we will do our students a favor by re-energizing and re-directing them; and we will have done the professor a needed favor by spreading education farther and deeper.

Technology manifested in the 'digital professor' can be dehumanizing and distancing. Our students are already subjected to huge lectures, novice teaching assistants, itinerant part-time lecturers, and other makeshifts. If and where the ideal exists, we should strengthen it but with all of the information we have on the imperfection of our endeavors we have enough reason to seize the opportunity to use new tools.

The instructor is no longer what he or she was when the university taught all of its students in one location. Each field of study had its 'professor', the supreme local authority. That supremacy has steadily faded, as students increasingly discovered more ways to learn than to sit and listen to the local 'guru'.

The role of the professor in the next decade will not be to provide information on the subject but rather to guide and encourage students as they wade through the deep waters of the information deluge. Instructors will thrive as mentors. They will develop the skills needed to nudge students through the crucial tasks of gathering and processing information: problem solving, analysis, decision making, and synthesis (Finn, et al, 1996).

The professor will be the point of

entry to the world beyond the campus library. He or she will be a kind of 'icon' on the monitor--click on the professor and he or she will take you to, and through, the information world. If this seems absurd remember, in part, it already takes place with the World Wide Web.

We will sacrifice face-to-face intimacy for the sake of giving students the freedom and power to learn. Those who want to stay in the fifty-minute-lecture business will find there will not be nearly as many of them and the lecture halls will be much quieter and far more tranquil--not to say, 'empty'--places (Finn, et al, 1996).

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***TOTAL QUALITY LEARNING IN THE CLASSROOM***

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## **Abstract**

### **Total Quality Learning in the Classroom**

Although all areas of higher education--from service departments, to administration, to classrooms--can benefit from TQM/CQI initiatives, the teaching/learning environment can benefit the most. This study presents the results of an ongoing research project comparing traditional approaches to teaching and learning with innovative applications of the principles of TQM and CQI in the college classroom. The study focuses on observing the effects of implementing strategies of student empowerment, feedback, collaborative teams, and the use of selected technologies. Findings indicate that students experience statistically significant positive shifts in their confidence in course content, working effectively in teams, understanding of consensus building, and knowledge of TQM/CQI. Overall, the partnership between students and faculty results in better learning and teaching.

## INTRODUCTION

This article addresses the positive impact of implementing principles of Total Quality Management (TQM) and Continuous Quality Improvement (CQI) in various classroom environments.

### Historical Perspective

Recent research, including observations by Hogg (1993), point out that quality organizations have several common characteristics: paying attention to customers, empowering employees, providing ongoing training, modifying organizational and reward structures, reforming union-management antagonism, forming partnerships with suppliers, and improving processes. Quality companies have seen dramatic improvement their vitality and competitiveness. Xerox, Motorola, Mayo Clinics, and AT&T Bell Labs, for example, have outperformed their competition through quality improvement initiatives.

### Applications of TQM in Higher Education

Higher education--from service departments, to administration, to classrooms--can benefit from TQM/CQI initiatives. The area which can benefit the most, however, is the teaching/learning environment. Faculty at several universities have begun implementing TQM/CQI techniques. For example, Robert Hogg (1993) has used various CQI techniques in a statistics department at the University of Iowa. He has emphasized improvement in teaching methods, course planning, and faculty teamwork to manage an academic department.

Danny Arnold (1994) has applied several TQM/CQI techniques in his business course. He

empowered students to assist in course design, including the type of assessments. To facilitate continuous improvement, he used student quality teams to provide ongoing feedback about learning experiences. He reported improved student performance; improved student attitudes toward the class, subject matter, and learning; clearer expectations of students; and increased instructor appreciation of student desire to learn and do quality work.

According to Potocki (1994), common elements of successful implementation of TQM/CQI in the classroom include the following: listening to student feedback, empowering students by inviting them to participate in course design and learning experiences, developing a teamwork environment among students and instructors, and demonstrating leadership in the classroom by practicing the quality philosophy and principles.

## DESCRIPTION OF THE STUDY

This study presents a classic experimental design comparing traditional approaches to teaching and learning with innovative applications of the principles of TQM and CQI in literature, technical writing, and engineering statistics courses. The study focuses on observing the effects of implementing strategies of student empowerment, feedback, collaborative teams, and the incorporation of targeted technologies in the college classroom.

### Student Empowerment

As industries employing TQM and CQI have learned, increasing employee empowerment is an important means of eliciting worker participation and improving job performance. Student empowerment results in similar behaviors. Students who participate in course design and help to establish teaching methods,

and the types and number of assessments, become valued, involved contributors to the learning process.

Professors conducting the study began courses without pre-determined, instructor-designed syllabi. Rather, the first classroom activity entailed syllabus negotiations. Under the guidance of the instructor, who relayed minimum course standards as required by the University, students decided requirements of the syllabus. Negotiations centered on expected classroom norms, such as class attendance and the ways students would interact with one another; the number, types, and weights of assignments; thresholds of acceptable performance on tests, projects, and papers; and opportunities for students to improve their work. The last of these elements particularly reinforced CQI, which emphasizes the importance of striving for incremental improvements in all efforts. These negotiations also provided an adjunct benefit, in that students practiced decision-making through consensus. The entire class began as a team, finding solutions to common questions and problems. Acting as a resource person and a coach, the professor acknowledged that students' experiences count, that their voices are valued.

### Feedback

Industries implementing TQM/CQI have discovered vast benefits in reducing, if not eliminating, adversarial relationships between management and labor by exchanging continuous feedback. Often students express dissatisfaction with traditional means of offering feedback about courses, professors, and instruction. Implementing a series of relatively simple classroom practices helped to break down potential adversarial relationships between professor and student. By assuring that communications about course expectations and

student progress traveled in both directions, professors acted as mentors or coaches. One instructor, for example, required students to keep attendance logs, annotating their level of class participation. The one-minute paper served as another effective means of eliciting student feedback. A more involved strategy, but one worth the effort, was the use of quality teams. Acting as intermediaries between the professor and the rest of the class, a small, self-selected group of students periodically met with the professor to offer comments about the course, as well as suggestions for improvement.

### Collaborative Teams

Just as the workplace uses teams to solve problems and complete projects, professors made extensive use of collaborative work groups. Students first participated in informal, temporary groups to discuss syllabus requirements, course policies, and early content-related, ungraded assignments. After the students became more comfortable with each other and with the team concept, professors formed permanent student teams which worked together to complete a variety of collaborative, graded assignments. Further, students committed to the concept of CQI by revising and improving their assignments. The team approach enabled students to learn and practice "real world" skills such as cooperation, negotiation, and conflict resolution; planning and project management; and critical thinking and analytical skills.

### Incorporation of Targeted Technologies

Implementing TQM/CQI in the classroom provides a good opportunity for incorporating technology into learning. In the statistics course, students participated in a classroom computer simulation which demonstrated the

result of the Central Limit Theorem, a critical concept for inferential statistics. The simulation was conducted using an LCD panel, laptop computer, overhead projector, and viewing screen. Students were also encouraged to use personal computers to handle problems with large data sets. Most courses lend themselves to the application of technology to strengthen classroom learning and prepare students to use technology in their future professions.

### FINDINGS

Pre- and post-assessments, using the Likert scale to determine student response, were administered to experimental and control groups in three types of courses: literature survey, technical writing, and engineering statistics. The assessment instrument for each group focused on individual skills, discipline and content skills, group experience and attitudes, and student knowledge of TQM/CQI. T-Tests for paired samples of the raw data reveal statistically significant positive changes in student attitudes in most areas. These preliminary findings demonstrate that the most important shifts were in student expressions of confidence in course content, in working effectively as members of a team, in their understanding of how to use consensus-building, and in their knowledge of TQM/CQI. Although some of the control groups also showed statistically significant changes in certain questions, the experimental groups evidenced higher frequencies and greater magnitude of such responses.

### CONCLUSIONS

As evidenced by data gathered during the study, as well as anecdotal testimony from students, the positive outcomes of implementing TQM/CQI in the classroom are many. In

addition to the findings reported above, professors observe that students accept more responsibility for their work, work harder to achieve quality, meet deadlines, and attend class more regularly. Students appreciate being asked their opinions and provide valuable feedback on what works and what does not. Professors report that they too are invigorated by this process. Overall, the partnership between students and faculty results in better learning and teaching.

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**Acceptance of Distance Learning Programs at the Graduate Level  
A Pilot Study**

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**Acceptance of Distance Learning Programs at the Graduate Level  
A Pilot Study**

**Abstract**

The number of Americans seeking college degrees is expanding at a rapid pace. To meet the challenge of the non-traditional student, one, who because of other commitments, cannot attend courses in a traditional campus setting, colleges and universities have instituted distance learning programs. There is little disagreement on the value of these programs in providing a service to students who cannot attend traditional classes. But at locations where students do have an option of attending a traditional course, or taking one through a distance learning approach, which will a student select? The study expanded the perceptions of the traditional versus distance learning approach to higher education, and the choice students would make if given the option. The results of the study revealed that students would significantly favor courses utilizing the traditional delivery approach versus a distance learning approach. The study also found that students at a university which does not have a distance learning program favor this approach to a significantly higher degree than students at a university which has a distance learning program. The study also found that students are almost equally divided on the perception of quality of the distance learning delivery approach, versus a traditional delivery approach.

## **Acceptance of Distance Learning at the Graduate Level: A Pilot Study**

The ever-increasing number of Americans seeking college degrees has challenged educational institutions to engineer solutions which will meet the need of today's lifestyle with all of its constraints. Increasing the quantity of courses or programs offered within the traditional campus setting may not always be the clear solution, since the vast majority of new students represent what one would identify as the "non-traditional" consumer. Many are older than their campus counterparts, and married with families which they support by working full time jobs. Some are women who perceive college degrees as a necessity in today's job market. While others, both military and civilian, are in positions which require frequent or at least intermittent relocations. Attending class on a regular basis is a virtual impossibility. One visible solution to this dilemma has been to offer courses utilizing a distance learning approach. While the actual approach may vary from school to school, the end result appears to be the same; offering accredited courses which do not require traditional attendance.

This study sought to examine the perceptions of graduate students towards distance learning delivery systems. Specifically, it solicited the opinions of graduate students attending Embry-Riddle Aeronautical University and the University of West Florida. Embry-Riddle currently has a distance learning program in place, while the University of West Florida does not.

The study attempted to solicit the

perceptions of Embry-Riddle students who had taken classes through their distance learning program. This proved unsuccessful since only three of the students surveyed had taken a course through their distance learning program.

The study then asked questions pertaining to the students preferred delivery method perceptions as to the quality of the learning experience. The data received from the survey gathered from the Embry-Riddle students were then compared to the data from the West Florida students to determine if any significance exists.

"The American Council on Education (ACE) reports that higher education in the United States is evolving. A number of customer-oriented models are being cultivated at a handful of schools across the nation" (Goforth, 1995, p. A08).

Campus borders are dissolving into cyberspace as colleges increasingly turn to interactive television and computers to meet a growing demand for higher education. They are finding that it is cheaper to deliver education to distant students in virtual classrooms -- a practice called distance education -- than to build more classrooms on campus. (Graves, 1995, p. B07)

"There is no question this distance learning is the hottest topic in higher education today, and the fastest growing," said Robert B. Leiter, Dean of the Division of Continuing Education at Mississippi State University"

(Graves, 1995, B07).

The overall goal of a distance learning program is an extremely basic one, to provide access to education for people who otherwise would not have that opportunity. Examples of what is being accomplished in the distance learning arena are numerous.

In Fort Collins, Colorado the National Technology University, founded 11 years ago, has awarded nearly 800 degrees, and has a student body of 1,500 in master's degree programs in 13 disciplines. While it lacks a traditional faculty and corresponding classrooms, it does, have state of the art technology. And today it appears that if you want to operate a college, that could be enough. Education today is often more feasible when it is brought to the consumer (Vigoda, 1995).

Technology is utilized by nursing professors at Texas A&M/Corpus Christi, to operate two remote-control cameras, while teaching students 300 miles away. It is used at the University of Akron and Cleveland State University, located 40 miles apart, as cost-saving partnership in which social-work students at both schools are combined into one class through interactive video. It is also used by the New Jersey Institute of Technology in Newark, in their bachelor's program in information systems, which is believed to be the first on-line bachelor's degree offering in the country where students can register for classes, order course materials, and take instruction without ever setting foot on campus (Vigoda, 1995).

The Pennsylvania State University

utilizes technology to reach as many as 20,000 students in 55 countries, and has just begun offering instruction to business students in Russia. In West Point, Pennsylvania, 85 workers at a Merck & Co. plant spend an hour or more each week in a room specially equipped for distance learning, complete with a large screen television participating in graduate courses beamed in from Lehigh University located in Bethlehem, Pennsylvania. Drexel University, is experimenting with synchronous education, in which classes have no pre-established times or lectures (Vigoda, 1995). Carnegie Mellon University now offers a program in corporate finance that includes long-distance learning through teleconferencing (Brown, 1995).

Distance education is dramatically changing the way colleges conduct business. Some educators believe we need to reverse the idea of the university as a place you go to obtain knowledge, instead we must package the knowledge and bring it to the student.

"Mel Elfin, executive editor of America's Best Colleges, a popular guidebook published by U.S. News & World Report, promotes a computerized future for liberal arts colleges, which he says are slipping into unaffordability. The average yearly cost of a liberal arts education is about \$21,000" (Holmstrom, 1995, p. 12).

Elfin is signalling colleges to collectively create an interactive multimedia core curriculum. This curriculum, which would be shared among colleges, "... would define a new-old liberal arts education for

students in a society rapidly turning to computers to deliver information and experience" (Holmstrom, 1995, p. 12).

Elfin believes the concept of distance learning, utilizing television monitors in a classroom to offer courses from distant locations, is already yesterday's technology due to the advent of laptop computers, and access to vast on-line global resources. Faculty members are now becoming individual tutors. At some colleges entire courses are computerized. Even the concept of going away to college may be replaced in the future with the offer of a less expensive path to a degree (Holmstrom, 1995).

National Technology University, for example, contracts with professors of 47 participating colleges. Instructors conduct a regular class on their home campuses, while a camera broadcasts their lectures across the country. At each of the 150 organizations which use the program, an on-site coordinator proctors examinations and manages the audio and video tapes. Those students who cannot attend a particular class can view the tapes at their convenience. Any questions or comments can be faxed, e-mailed, or called in to the instructor either during or after the class session.

Most distance learning classes are conducted in a similar fashion, with variations depending on the sophistication of the equipment.

Established in 1964 as an experimental college by a group of college presidents, Union Institute, the 'university without walls' instructs its students - mostly adults who are full-swing into their careers - through

seminars and meetings.

Union students design their own curriculum, relying on the school's worldwide network of adjunct professors. The students learn by working one-on-one with an expert in the field. The school's Center for Distance Learning enables students to take classes by using a personal computer.

Headquartered in Walnut Hills, the Union Institute has an enrollment of 1,800 in its programs in Miami, Los Angeles, San Diego, Sacramento, California, Washington D.C. and in 17 counties (Goforth, 1995, p. A08).

Through distance education, Eastern Oregon State College trains nurses and Oregon State University offers a liberal arts program to various locations within the state (Graves, 1995). The use of a satellite system, referred to as Ed-Net, links Oregon's eight colleges and universities and 16 community colleges. "Next year, the higher education system expects to offer 150 to 175 courses over the network" (Graves, 1995, p. B06). This "... does not include all the Eastern Oregon State College students who use computers to meet by electronic mail or virtual classrooms for discussions, lessons, and assignments. One in four Eastern students earns his or her degree through electronic studies" (Graves, 1995, p. B06). At the present time Oregon colleges and universities, which enroll 60,000 students, expect an additional 20,000 students to seek admission during the next decade (Graves, 1995).

"Washington State University is using the same strategy for its branch campus in

Vancouver. The campus will include several electronic classrooms linked to a telecommunications network based in Pullman, Washington. The university already uses the system to teach students in Spokane, Tri-Cities and Wenatchee" (Graves, 1995, p. B06). Distance education is so widespread and developing so rapidly that, one expert predicts, by 2050 most colleges will be replaced by distance-learning consortiums, some run by educators and some by corporations such as IBM and Disney (Vigoda, 1995).

Arthur Levine, president of the Teachers College, Columbia University, in New York states that there are about 3,000 colleges in the country now, and he expects that by the middle of the next century it will decrease to the hundreds (Vigoda, 1995). Levine, attributes this to the fact that the 18 to 22-year-old, who has long been considered the typical college student, now comprises less than one-quarter of the college population. The largest growth has been in the group which consists of people over 25 who attend part-time because of jobs and families. Levine believes that this group does not want to spend time on campus. Instead, they want to show up for classes and leave. What they are really seeking is great service, coupled with low cost and high quality, and they want it to be conveniently packaged. (Vigoda, 1995). They will seek those institutions which can meet their needs, regardless of the existence of a physical structure to warehouse the programs.

#### Concerns

Many educators have experienced concern over the use of distance learning education. One of the criticisms of distance education is that it is impersonal and removes close up and personal contact, rapid give-and-take, and other forms of communication that can only be achieved with human contact.

Miller, a philosophy professor at Salisbury (Maryland.) State University, summed up that perception when he referred to interactive video as the most marketable counterfeit for face-to-face instruction as we are ever about to achieve. He focused on the ramifications of living in a culture that is composed almost entirely of counterfeits, and of the ability to distinguish them from the real thing - the excitement, the fear, the facial expression of success when a student solves the problem on his or her own. This personal reaction can only be appreciated or reinforced in real classrooms.

Some presidents of liberal arts colleges view the computer as almost an anathema to the ethos of the liberal arts experience.

'I think this is a vision of a future with autodidacts as opposed to a future of students,' says Richard Warch, president of Lawrence University in Appleton, Wisconsin. 'Part of what a liberal arts college does is train student in the kinds of social skills and negotiations that become totally absent in the kind of world [Elfin] described,' he says. 'We would just be sitting in front of our Powerbooks'. (Holmstrom, 1995, p. 12)

Many believe electronic lessons lack a necessary personal touch. 'It just ain't the same,' concluded one Southern Oregon State College professor. Sometimes teachers drive to remote

sites just to meet the students they see on their video screens" (Graves, 1995, P. B07).

"I think there's certainly a degree of resistance from traditional faculties to this,' states ACE's Dave Merkowitz. "And I think there are important questions that arise about student-faculty interactions, about the liberal arts, about the social interaction of the university. But you would expect that in a time of innovation" (Goforth, 1995, p. A08).

Numerous proponents of distance education acknowledge that not all disciplines lend themselves equally to being taught electronically. Technological fields, that are lecture-oriented appear to be especially well-suited. They respond to the concern about video classes being impersonal with another question: How much more impersonal can one get than a having lecture hall crammed with 500 students (Vigoda, 1995).

Professors also point out that some students, who might never utter a word in a traditional class suddenly become cyberspace chatterboxes. Students also find that it may be easier to contact professors by e-mail than during office hours (Vigoda, 1995).

#### Statement of the Problem

Would university/college students, if given the opportunity to choose, select a program which utilizes a distance learning approach over one which uses a more traditional delivery system (e.g. courses

taught by a live professor in a classroom). With the development of increased communication and computer technology, college and universities could, at some point in time, consider a change in their delivery system from a more traditional one, to one which utilizes various levels of technology. Before this decision is made, however, the desires of the market must be considered. Would, for instance, a student choose a course taught by video tape/computer if another university is willing and able to provide the more traditional type of classroom instructions? Would enrollment decline since there will be no need for the presence of the university/college administrative support staff at locations where the programs currently exist (e.g. military installations), thus no one available on site to market the programs? While there is little disagreement on the value of distance learning programs in providing a service to those students who are at locations where they cannot attend traditional classes, what would be the impact at those locations where students would have a choice?

#### Purpose

The purpose of this study is to ascertain whether students will choose a more traditional delivery system, versus a video tape/computer distance learning approach, if both were available.

#### Scope of the Study

While the University of West Florida has a limited number of undergraduate courses available utilizing a distance learning approach, Embry-Riddle Aeronautical University began offering a Master's degree

through its Independent Study Program in 1993.

Distance learning, courses are presented to students utilizing video tapes of actual classroom presentations, course study guides, textual materials, and interactive communication with the faculty members. Communication between students and faculty are provided via an electronic bulletin board. This communication enables students to review assignments, and provide feedback to students via the interactive communication network. The electronic bulletin board supports message, delivery between students and faculty and on-line conference capability (Gallogly, 1995, p. 2).

The initial program utilizes an in-house bulletin board system called Skytalk, which was developed, maintained, and operated by Embry-Riddle personnel. To make the program accessible to students located overseas, an alternate computer communication system was required, and CompuServe was selected. CompuServe provided the Independent Study program with the ability to connect, not only DOS users, but Windows and MAC users as well.

A study by Gallogly (1995) compared the qualitative and quantitative data for selected Embry-Riddle graduate courses utilizing both the distance learning and traditional classroom delivery methods. The study found there is no significant difference in delivery methods where outcomes are compared.

The scope of this study however, only addressed the delivery system utilizing the Embry-Riddle Independent Study Program. Embry-Riddle has also experimented with distance learning classes utilizing the U.S. Army's T-Net System and other video conferencing sources, but these approaches are currently in the developmental stage, and an entire degree program is not presently available utilizing these delivery systems.

### Hypothesis

The research hypothesis states that there will be a significant difference in the number of students favoring the traditional delivery approach, versus those who select a video tape/computer approach, if the option is available. The null hypothesis states that there will be no significant difference in the number of students who would select a traditional educational delivery system versus those who would select a video tape/computer approach, if given the option, as measured at the  $\alpha=.05$  level of significance.

The study will also seek to determine if there is a significant difference in the acceptance level of a distance learning program at a university where there is currently one being offered, as compared to a university where a distance learning is not an option. This will be accomplished by comparing the perceptions of the Embry-Riddle Aeronautical University and University of West Florida Students on the value of distance learning.

### Population

The sample population will be composed of graduate students enrolled in courses at the University of West Florida, and Embry-Riddle Aeronautical University.

### Methodology

Graduate students enrolled in courses during the Embry-Riddle Aeronautical University Summer 1996 term at Eglin AFB, Tyndall AFB, Pensacola NAS, NAS Whiting Field, and Hurlburt Field, Florida, and the University of West Florida students enrolled in the Summer 1996 semester were surveyed utilizing an author developed questionnaire (Appendix A) on whether they would select a program with a traditional (live instructor) versus non-traditional (video/computer) delivery method if a choice was available. A two-dimensional Chi-Square test was performed, where appropriate, to determine if a significant difference existed between the Embry-Riddle and West Florida graduate students.

### Results

Questions 5-7 were examined and the data quantified, where appropriate, utilizing a two-dimensional non-parametric Chi Square test. The results are shown on Table 1-3.

*Acceptance of Distance Learning Programs at the Graduate Level  
A Pilot Study*

Table 1

Question 5: If Given the Option, (Assume Having the Same Instructor, and no Conflicts With Vacations, Business Trips, and Military Temporary Duty Assignments), I Would Prefer to Take a Course by the Traditional Approach/Distance Learning Approach

Approach	Traditional Approach		Distance Learning	
Embry-Riddle	68	(91.8%)	6	(8.1%)
West Florida	154	(72.%)	60	(28%)
Two-Dimensional Chi Square			12.363	
Degrees of Freedom (df)			1	
p Value at .05			3.841	

Table 2

Question 6: Since, in Reality, the Cost for a Distance Learning Class is Approximately 33% Higher in Cost than Traditional Classes, Would the Answer You Selected for Question 5 Change? Yes/NO

	Yes		No	
Embry-Riddle	6 of 6	(100%)	0	(0%)
West Florida	37 of 60	(61%)	23	(38%)

Note: The data reflect the total number of individuals identified in Question 5 who stated they preferred the distance learning approach, and the number who would change their response if the cost was increased. None of the respondents who indicated that they preferred the traditional approach indicated they would change to the distance learning approach if this cost increased.

Table 3

Question 7: When I Hear That a Student Has Taken a Course Through a Distance Learning Program (i.e. Never Having to Attend a Formal Class. I perceive it to be, Academically Speaking, One of Lesser Quality

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
Embry-Riddle	6 (8.1%)	28 (37.8%)	14 (18.9%)	25 (33.7%)	0 (0%)
West Florida	29 (13.5%)	70 (32.7%)	42 (19.1%)	55 (25.7%)	18 (8.4%)
Two Dimensional Chi Square				9.3	
Degree of Freedom				4	
p Value at .05				9.488	

### Discussion

A total of 74 graduate students enrolled in courses offered by Embry-Riddle Aeronautical University, and 214 graduate students in courses taught by the University of West Florida were surveyed. Data for the Embry-Riddle students revealed that, 1 was in the MBA program, 72 in the Master of Aerospace Science Program, and 1 in the "other" category. The 214 University of West Florida students were all enrolled in the MBA program.

Since only 3 of the 74 Embry-Riddle students had ever taken a course utilizing the on-line and video tape distance learning approach, the data for questions 1-4 could not be quantified, and is reported for information only purposes.

Question number 1 was used to determine if students who have participated in both methods rated the educational experience as better for distance learning. Two stated it was about the same, and one replied distance learning was worse.

Question number 2 asked which system students learned more from. Two students agreed they learned just as much through distance learning, and 1 disagreed.

Question number 3 asked if the educational experience was lacking in the distance learning class due to the lack of face-to-face student interaction. One student had no opinion, and two students disagreed, indicating the experience was not lacking.

Question number 4 asked if the educational experience was lacking in the distance learning class due to the lack of face-to-face student teacher interaction. One student had no opinion, and two students disagreed, indicating the experience was not lacking.

The data for questions 5-7 compared the responses of the Embry-Riddle students to the West Florida students. Question number 5 was used to determine which format students would register for if both systems were offered. Sixty-eight of the Embry-Riddle students preferred the traditional approach, while six chose the on-line/video tape distance learning approach. The data from the West Florida students revealed 154 selecting the traditional approach, compared to 60 preferring the distance learning approach. A two-dimensional non parametric Chi Square test was conducted and found that a significance difference exists between the two groups (Table 1). A significantly higher number of West Florida students preferred the distance learning approach as compared to the Embry-Riddle students.

Question number 6 attempted to determine if cost was a factor in choosing either system since, in reality, the on-line/video tape distance learning approach would be 33% more experienced than traditional classes. The six Embry-Riddle students (100% who selected the distance learning approach answered yes, indicating their answer to question 5 would change if on-line/video tape distance learning classes were more expensive. The remainder of the students answered no, indicating they would prefer the traditional, lower cost approach.

Thirty-seven (61%) of the 60 West Florida students who stated that they would prefer the on-line/video tape approach indicated that they would change their response if cost was a factor (Table 2).

Question number 7 measured student perceptions towards on-line/video tape distance learning approach courses pertaining to quality. Five Embry-Riddle students Strongly Agreed that on-line/video tape distance learning approach courses, academically speaking, are of lesser quality, 28 Agreed, 14 had No Opinion, 17 Disagreed, and none Strongly Agreed. The West Florida students responses revealed 29 in Strong Agreement, 70 Agreed, 42 No Opinion, 55 Disagreed, and 18 Strongly Agreed.

### Conclusions

The data collected from question 5 clearly revealed the traditional approach is preferred over the distance learning approach when students have the opportunity to choose. When the results from the two universities were compared, the University of West Florida students, to a significant degree, would select the distance learning courses. The results are interesting in that the University of West Florida does not have a distance learning program currently in place while Embry-Riddle does.

In question 6, when cost is factored into the equation, all of the Embry-Riddle students who had initially indicated that they preferred the distance learning approach, opted for the traditional approach. Comparatively, 61% of the West Florida students who had previously indicated a

preference for distance learning in question 5, would select the traditional approach, given the increased cost factor.

satisfy those needs.

Question 7 revealed that approximately 46% of the Embry-Riddle students believe a course taken through a distance learning program to be one of lesser quality. Approximately 19% had no opinion, and the remaining 34% of students disagreed that distance learning programs were of lesser quality.

### Recommendations

While there has been recent emphasis in expanding the distance learning approach to various areas as of the market place, universities must be concerned with the needs and desires of the specific market which they are attempting to target. Assuming that the market would be willing to accept a certain portion of their courses utilizing a distance learning approach may lead to a reduction in the total market share. For this reason the authors recommend that before considering a modification or change a current system in an established market, an in-depth study be conducted to ensure that the proposed change will not result in a loss of market share. Universities must be aware that, in many cases, it is still a buyer's market, and if their needs are not taken into consideration, the buyer is always free to seek another university who will

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### **Educational Delivery Systems**

#### Traditional versus Video Tape and On Line Distance Learning

The following survey is being conducted by Dr. Marian Schultz of the University of West Florida and Drs. Jim Schultz and Steve O'Brien of Embry-Riddle Aeronautical University. It is intended to measure students attitudes towards educational delivery systems and to determine, if given the opportunity to choose, whether a student would select a program which utilizes a distance learning approach, over one which uses the traditional delivery systems.

#### **Traditional Delivery System**

For the purpose of this survey a traditional delivery system is defined as having an instructor in the classroom with the students, producing a personal interactive environment. This is the common approach to education and the one most familiar to students.

#### **Distance Learning System**

Another approach to education is generally referred to as Distance Learning, where students and the instructor are not together in a class room. For the purpose of this questionnaire, distance learning courses are presented to students utilizing video tapes of actual classroom presentations, course study guides, textual materials, and interactive communications with a faculty member. Communication between students and faculty are provided via an electronic bulletin board. The electronic bulletin board supports message delivery between students and faculty and on-line conference capability.

#### **Assumptions**

1. Cost per credit hour are the same.
2. Tests, graded assignments, study guides, and textual materials would be identical.
3. The length of the semester and the grading criteria would be identical.

Please feel free to make any additional comments pertaining to this survey below. Thank you very much for your participation.



***A COMPARATIVE ANALYSIS OF PROPOSED IMPROVEMENTS  
IN AVIATION EDUCATION:  
NATIONWIDE AVIATION EDUCATION PROGRAMS  
VERSUS  
EMBRY-RIDDLE AERONAUTICAL UNIVERSITY***

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**ABSTRACT**

**A Comparative Analysis of Proposed Improvements  
in Aviation Education:  
Nationwide Aviation Education Programs  
Versus  
Embry-Riddle Aeronautical University**

**by**

**Robert M. Kuhns, Ed.D.  
and  
Daniel E. Johnson, Ed.D.**

This paper presents a comparison of findings related to a study of proposed improvements in four-year aviation education programs as indicated by nation-wide survey instruments conducted in the summer of 1993 and during a follow-on survey performed at Embry-Riddle Aeronautical University in early 1996. Aviation education program directors of four-year non-engineering collegiate aviation programs and faculty members throughout the Embry-Riddle Aeronautical University system were contacted to provide input as to methods of improving the quality of aviation education programs. Key information obtained was then paraphrased into a written instrument that was categorized in order of importance by the two different mailings. The "improvement of both faculty and teaching aids" and "to provide more student internships" were the most recommended improvements in this study. This paper provides multiple nationwide-ranked proposed improvements in aviation education, and describes peer-suggested methods of improving student attainment of knowledge, competency, and proficiency in aviation education.

### Original Nationwide Aviation Education Study - 1993

Data were collected in the summer of 1993 to ascertain the perceived quality of four-year and higher aviation education programs throughout the nation. The following information was part of Robert Kuhns' doctoral thesis and additional research conducted by Daniel Johnson in 1996. The original study information was obtained from program coordinators, department heads, or similar individuals at the various institutions throughout the United States (N=68). The follow-on research was conducted throughout the Embry-Riddle Aeronautical University (ERAU) system consisting of regional faculty advisors and center directors (N=226). A copy of the telephone interview questionnaire is found in Appendix A. Objective and subjective data were obtained from program directors in this study. Demographics as well as opinions were acquired. Key factors concerning aviation education were then organized into a second instrument which may be found in Appendix B. Aviation department heads were mailed the instrument and asked to rank in importance the various key factors. This instrument became the basis for the ERAU study (see Appendix C).

The University Aviation Association (UAA) membership list was used to identify four-year and higher non-engineering aviation education programs offered in the United States. Aviation programs less than four years were not considered in this study. The UAA April 1992, Membership List contained the names of 106 member institutions of which 68 were found by the survey to offer four-year and greater aviation

programs (University Aviation Association, 1992). In the process of calling all 106 member institutions an updated number (68) of institutions that offer four year and higher aviation education programs was obtained.

The first questionnaire requested information of both a quantitative nature and a subjective nature. Student number, faculty demographics, future educational plans, aviation equipment and facilities, intrastate student accessibility, and student recruiting were surveyed. More difficult questions were asked of the program/department chairs and included the following areas: program quality, ranking against a national norm, current program status, factors contributing to quality aviation education, and which institution was considered to offer the best aviation education program in the United States.

The second questionnaire asked aviation program directors to rank key quality factors from the most important to the least important. These key factors were obtained from the most frequent responses in the telephone interview questionnaire.

### Operational Procedures

All of the 68 identified member institutions were contacted by phone to conduct a structured phone interview. Confidentiality was assured to all participants. All institutions were contacted a minimum of four times to maximize responses. If a program director was unable

to respond after four attempts, the institution was deleted from the survey. This was strictly random with no bias on the part of the telephone interviewer.

A telephone questionnaire technique allowed subjects to be more open in their responses, and if needed, to ask for clarification concerning questions. The telephone technique also encouraged more detailed responses and provided for greater participation than the mailed format questionnaires. This procedure may be considered successful if it has the 55 percent or greater success rate generally accepted by research authorities (Perry, 1988).

The telephone questionnaire was written and submitted for evaluation to the researcher's doctoral committee. The recommended changes were incorporated into a second draft which was then presented to experts in questionnaire design. Their modifications were adopted. The questionnaire was also presented to experts in English and Grammar at Wichita State University. Next, it was presented to several program directors at member institutions for their review. The final draft was again presented to the doctoral committee. A small pilot group was then selected and a phone interview was conducted. After several interviews, small changes were adapted to clarify and to improve understanding of the questionnaire. One additional question was also added (number 21) as per the suggestion of a member of the pilot group. The second (written) instrument underwent a similar process and was approved by the doctoral committee before it was mailed.

The pilot group consisted of a former director of an aviation education program, a member of a nationwide aviation study, and several of the doctoral committee members. The revised final drafts were then presented to the researcher's committee chairman for final approval. Developmental and validation processes were completed for this instrument.

### Research Design and Analysis

The findings of this study, drawing on its qualitative and quantitative data, are presented in a descriptive design. Findings included program age, curriculum offered, future curricular plans, faculty demographics, equipment and aviation facilities, student recruitment, CAA membership, and follow-up of graduates. This information although obtained will not be presented in this paper. Subjective responses recorded on aviation program quality, factors that constitute a high quality aviation education program, and methods of improving quality of aviation education will be presented in this paper. Findings were organized in a descriptive and summarizing format to assure confidentiality to all participants.

### Factors Contributing to the Quality of Aviation Education

One question asked of program directors in this survey was, "What factors do you feel constitute to a good aviation program?" The question was completely open ended. For brevity, similar responses were combined. The following factors, in order of number of times mentioned, are listed on the next page:

*A Comparative Analysis of Proposed Improvements in Aviation Education:  
Nationwide Aviation Education Programs Versus Embry-Riddle Aeronautical University*

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Factors Associated with the Quality of Aviation Education

(Listed in order of number of times cited)

- High Quality Faculty
- Good Overall Program
- High Quality Facilities
- High Quality Students
- Strong Flight Simulator Department
- Academic Support
- Concentration of Aviation Studies
- Networking with Aviation Industry
- Student Job Placement
- Blend of Liberal Arts Curriculum
- Student Oriented Faculty
- Professional Program
- General Business Background
- Internships in Industry
- Good Communication Skills
- New Curriculum
- Adequate Funding of Program
- Program Safety
- Other Factors\*

\*Eight other responses recorded in the survey were mentioned only once, and are not listed in the above factors.

The next survey question asked the respondent to comment on factors that comprise a high quality aviation education. The question was, "What do you feel is necessary in order to provide excellence in Aviation Education?" This is similar to the preceding question, however the word excellence was emphasized by the interviewer. Some of the same responses occur in the next list, however it is interesting to note that many different responses were obtained when excellence was in fact substituted for good.

Necessary Factors to provide Excellence in Aviation Education

(Listed in order of number of times cited)

- High Quality Faculty
- High Quality Facilities
- Networking with Aviation Industry
- High Quality Aviation Program
- Academic Support
- Adequate Funding of Program
- Professional Program
- Conduct Research in Aviation
- Program contain Interested Students

*A Comparative Analysis of Proposed Improvements in Aviation Education:  
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Variety of Aviation Courses Offered	Increase number of Available Aircraft
Student Oriented Faculty	Improve Teaching Aids
Industry Involvement in Curriculum	Increase number of Aviation Programs
Provide Job Placement Services	Increase Student Recruitment
Greater Emphasis on Aviation Safety	Increase Marketing Budget
Promote Critical Thinking Skills in Students	Increase number of Hands On Activities
Provide Internships in Aviation Industry	Provide More Student Internships
Provide More Financial Aid To Students	Increase Faculty Travel
Other Factors*	Improve Student Placement System
	Increase Industry Involvement

\*Seven other responses recorded in the survey were mentioned only once, and are not listed in the above factors.

Program directors were then asked, "If you had unlimited resources, what three changes would you make in the Aviation Education program at your institution?" The most answered response was to improve facilities. The following list describes the responses given:

Proposed Improvements in Aviation Education

(Listed in order of number of times cited)

- Improvement of Facilities
- Improvement and Addition of Flight Simulators
- Increase Faculty Number

- Add Masters Degree Program In Aviation
- Increase Library Resources
- Initiate Research Center
- Increase Number of Field Trips
- Offer Additional Scholarships
- Increase Faculty Development Programs

Other Factors\*

\*Five other responses recorded in the survey were mentioned only once, and are not listed in the above factors.

The top 12 responses of each of the three preceding lists were then organized

into a written questionnaire (see appendix B) which was mailed to the UAA member institutions with four-year degree programs. These three questions were considered to be of greatest importance to establishing the norm of quality aviation education throughout the United States. The top 12 responses were chosen to make the ranking by the program directors less difficult. All responses that were recorded more than twice on the original survey were included. The ranking of each of the top 12 groups of responses in a written format allowed for both a reaffirmation of previous oral responses and the opportunity to rank the other respondent's opinions. Forty-two program directors returned the original survey representing a response rate of 61.8 percent.

spreadsheet program Excel. The following table summarizes the responses (Table I).

Comparison of Original Study Results  
to the  
1996 ERAU Survey

One hundred forty two Embry-Riddle faculty returned the second survey. This is a response rate of 62.8 percent. When asked to rank the factors of a high quality aviation education the following responses were obtained (see Table I). The following point system was employed to determine rank. When a factor was ranked first, twelve points were awarded to this factor. If that factor ranked second, eleven points were awarded. This system was applied down to the lowest rated factor, which received only one point. Using this method, rank can be established by noting the factor that obtains the highest number of points. The factors are also listed in order from highest to lowest as obtained in the original study. Responses were tabulated using the

TABLE I  
 FACTORS OF HIGH QUALITY AVIATION EDUCATION PROGRAMS

Factors	Original Study	ERAU Study	
	Total Points in Rank Order	Total Points	Rank Order
High Quality Faculty	437	1460	1
Good Overall Program	350	1160	2
Student Oriented Faculty	334	1074	4
High Quality Students	319	1023	5
Academic Support	316	996	6 tie
Professional Program	272	1126	3
High Quality Facilities	260	740	8
Networking With Aviation Industry	258	893	7
Concentration Of Aviation Studies	204	996	6 tie
Student Job Placement	196	592	10
Blend Of Liberal Arts Curriculum	191	605	9
Strong Flight Simulator Department	143	411	11

The survey responses indicated that a high quality faculty is the number one response by a large factor in both studies. This was the most cited factor and was ranked by the mail survey also as the number one factor. A good overall program was the second highest cited response, and it was also second highest in the mail survey. Results of both surveys are as follows.

Factors of High Quality Aviation Education Programs

(Top Six Responses Original Study)

High Quality Faculty  
Good Overall Program  
Student Oriented Faculty  
High Quality Students  
Academic Support  
Professional Program

Factors of High Quality Aviation Education Programs

(Top Six Responses ERAU Study)

High Quality Faculty  
Good Overall Program  
Professional Program  
Student Oriented Faculty  
High Quality Students  
Academic Support

Survey respondents were then asked to rank the necessary factors to provide excellence in aviation education. The following table provides the results by the use of the point system as previously described (Table II).

TABLE II

NECESSARY FACTORS TO PROVIDE EXCELLENCE  
 IN AVIATION EDUCATION

Factors	Original Study	ERAU Study	
	Total Points in Rank Order	Total Points	Rank Order
High Quality Faculty	430	1412	1
Student Oriented Faculty	372	1073	4
High Quality Aviation Program	333	1142	2
Adequate Funding Of Program	322	896	5
Academic Support	311	889	6
Professional Program	287	1113	3
Program Contains Interested Students	250	816	9
High Quality Facilities	220	643	11
Industry Involvement in Curriculum	213	818	8
Networking with Aviation Industry	206	792	10
Variety of Aviation Courses Offered	204	853	7
Conduct Research In Aviation	101	629	12

"High quality faculty" was the number one ranked response in both surveys. The second highest cited response "student oriented faculty" was ranked fourth in the second survey. ERAU ranked the third choice of the original survey as their second. The top six necessary factors to provide excellence in aviation education in both surveys are as follows:

Necessary Factors To Provide  
Excellence In Aviation Education

(Top Six Responses Original Study)

High Quality faculty

Student Oriented Faculty

High Quality Aviation Program

Adequate Funding of Program

Academic Support

Professional Program

Necessary Factors To Provide  
Excellence In Aviation Education

(Top Six Responses ERAU Study)

High Quality faculty

High Quality Aviation Program

Professional Program

Student Oriented Faculty

Adequate Funding of Program

Academic Support

Finally, program directors were asked to rank 12 proposed improvements in aviation education. The following table is based on the aforementioned point system and represents the rank order established by the mailed survey (see Table III).

TABLE III

RECOMMENDED IMPROVEMENTS IN AVIATION EDUCATION

Factors	Original Study	ERAU Study	
	Total Points in Rank Order	Total Points	Rank Order
Provide More Student Internships	348	947	5
Increase Faculty Number	345	751	9
Increase Number Of Hand On Activities	332	1265	2
Improve Teaching Aids	318	1278	1
Improve Student Placement System	302	890	7
Improvement Of Facilities	300	961	4
Increase Student Recruitment	274	1134	3
Improvement And Addition Of Flight Simulators	240	795	8
Increase Marketing Budget	233	961	4
Increase Number Of Available Aircraft	207	701	10
Increase Faculty Travel	168	488	11
Increase Number Of Aviation Programs	159	905	6

An unexpected outcome of this study was that the number one ranked response "provide more student internships" in the original study fell to fifth place in the second study. The second study showed "improvement of teaching aids" as the number one ranked factor. The following list represents the top six ranked proposed improvements in aviation education obtained in both studies:

RECOMMENDED IMPROVEMENTS IN AVIATION EDUCATION

(Top ranked six factors Original Study)

Provide More Student Internships

Increase Faculty Number

Increase Number of Hands on Activities

Improve Teaching Aids

Improve Student Placement System

Improvement of Facilities

RECOMMENDED IMPROVEMENTS IN AVIATION EDUCATION

(Top ranked six factors ERAU Study)

Improve Teaching Aids

Increase Number of Hands on Activities

Increase Student Recruitment

Improvement of Facilities

Increase Marketing Budget

Provide More Student Internships

This study provided two peer-referenced national-based groups of proposed improvements in collegiate aviation education. It is the hope of the authors that this work will provide a basis for such improvements. Obviously, some improvements are more practical to initiate than others, however with the priorities as established in this study the program director may be guided in decisions involving improvements in educational quality.

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APPENDIX A  
AVIATION EDUCATION TELEPHONE SURVEY  
Original Study (1993)

Institution name \_\_\_\_\_

Street Address \_\_\_\_\_

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Contact person \_\_\_\_\_

Title \_\_\_\_\_ Phone \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_

1. What is the size of your parent institution? \_\_\_\_\_

2. How many Aviation education students are currently enrolled?

AS \_\_\_\_\_, BS \_\_\_\_\_, MBA \_\_\_\_\_, MS \_\_\_\_\_,  
Ed.D. \_\_\_\_\_, Ph.D. \_\_\_\_\_,  
Other \_\_\_\_\_ (if so, please specify)

3. What is the highest aviation degree offered?

Circle one: AS BS MBA MS Ed.D Ph.D

4. Within the next two years, does your institution plan to offer any higher level Aviation education degrees than presently offered? Yes \_\_\_\_\_ No \_\_\_\_\_. If yes what? (circle) BS, MBA, MS, Ed. D., Ph. D., Other \_\_\_\_\_

5. What year was your aviation program established? \_\_\_\_\_

6. Faculty demographics:

Number of full time aviation faculty \_\_\_\_\_  
Number of part time aviation faculty \_\_\_\_\_  
Number of minority aviation faculty \_\_\_\_\_  
Number of women aviation faculty \_\_\_\_\_  
Number of aviation faculty with degree higher than baccalaureate \_\_\_\_\_  
Number of aviation faculty with degree higher than masters \_\_\_\_\_

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7. Using a scale of 1 to 5 with 5 being highest quality how would you rate your aviation program as compared to other similar programs?      1 2 3 4 5

8. How do you feel your aviation program would rate against a nationwide norm?

- One of the best
- Better than most
- Average
- Somewhat below the norm
- One of the worst

9. Does your institution offer any aviation education scholarships? Yes No If so, what types?

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10. Would you characterize your aviation education program as growing, remaining constant, or declining in student number? (circle one) What factors do you attribute this to?

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11. What factors constitute a good Aviation Education program?

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12. What do you feel is necessary in order to provide excellence in Aviation Education?

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13. If you had unlimited resources, what three changes would you make in the Aviation Education program at your institution?

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14. What options are available in your Aviation Education program? (Check those that apply)

Aviation Management Program \_\_\_\_\_

Flight Training \_\_\_\_\_

Aircraft and Powerplant Training \_\_\_\_\_

Airway Science:

Airway Science Management \_\_\_\_\_

Airway Computer Science \_\_\_\_\_

Aircraft Systems Management \_\_\_\_\_

Airway Electronic Systems \_\_\_\_\_

Aviation Maintenance Management \_\_\_\_\_

Other \_\_\_\_\_

15. What institution in your opinion offers the best aviation education in the United States...

In four year programs? \_\_\_\_\_

At masters level or higher? \_\_\_\_\_

16. How would you rate your institution in relation to one or more of the preceding best institutions on a scale of 1-5 with 5 being the aforementioned institution? 1 2 3 4 5

17. How many of the following are available in your program?

Flight training aircraft \_\_\_\_\_

Flight training simulators \_\_\_\_\_

Certified Flight instructors \_\_\_\_\_

Certified Ground instructors \_\_\_\_\_

Aviation Scholarships \_\_\_\_\_

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18. Would you describe your program as being accessible to students from other states? Yes \_\_\_\_\_ or No \_\_\_\_\_. If yes, to what degree do you rate your institution's accessibility?

Very accessible \_\_\_\_\_  
Somewhat accessible \_\_\_\_\_  
Limited accessibility \_\_\_\_\_

19. Do you actively recruit students? Yes \_\_\_\_\_ No \_\_\_\_\_.

If so, how? \_\_\_\_\_

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20. Do you follow-up on graduates? Yes \_\_\_\_\_ No \_\_\_\_\_.

If so, how frequently? \_\_\_\_\_

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21. Is your institution currently a member of The Council on Aviation Accreditation? Yes \_\_\_\_\_ No \_\_\_\_\_ Do you plan to join in the future? Yes \_\_\_\_\_ No \_\_\_\_\_

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APPENDIX B

FOLLOW-UP WRITTEN QUESTIONNAIRE  
Original Study (1993)

Robert M. Kuhns  
125 S. Hillside  
Wichita, KS 67211  
316 682-1921

February 26, 1993

Dear Colleague:

Early this summer I contacted you by phone to participate in my doctoral dissertation study about aviation education. Those of you that participated in the previous study provided me with some interesting results. Three key questions of the survey have been paraphrased below with their most frequent responses. Please rank (1-12) the responses in order of importance (1 being the most important) and return your response to me in the self addressed stamped envelope.

Statement: Factors of High Quality  
Aviation Education Program

Rank (in order of importance)

_____	Concentration of Aviation Studies
_____	Blend of Liberal Arts Curriculum
_____	High Quality Faculty
_____	Professional Program
_____	High Quality Facilities
_____	High Quality Students
_____	Strong Flight Simulator Department
_____	Academic Support
_____	Good Overall Program
_____	Networking with Aviation Industry
_____	Student Job Placement
_____	Student Oriented Faculty

Statement: Necessary Factors to provide  
Excellence in Aviation Education

Rank (in order of importance)

- \_\_\_\_\_ Variety of Aviation Courses Offered
- \_\_\_\_\_ Professional Program
- \_\_\_\_\_ High Quality Facilities
- \_\_\_\_\_ Networking with Aviation Industry
- \_\_\_\_\_ High Quality Aviation Program
- \_\_\_\_\_ Academic Support
- \_\_\_\_\_ Adequate Funding of Program
- \_\_\_\_\_ Industry Involvement in Curriculum
- \_\_\_\_\_ Conduct Research in Aviation
- \_\_\_\_\_ Program contain Interested Students
- \_\_\_\_\_ High Quality Faculty
- \_\_\_\_\_ Student Oriented Faculty

Statement: Proposed Improvements in Aviation Education

Rank (in order of importance)

- \_\_\_\_\_ Increase number of Hands On Activities
- \_\_\_\_\_ Improve Teaching Aids
- \_\_\_\_\_ Improvement and Addition of Flight Simulators
- \_\_\_\_\_ Increase Faculty Number
- \_\_\_\_\_ Increase number of Available Aircraft
- \_\_\_\_\_ Improve Student Placement System
- \_\_\_\_\_ Increase number of Aviation Programs
- \_\_\_\_\_ Increase Student Recruitment
- \_\_\_\_\_ Increase Marketing Budget
- \_\_\_\_\_ Improvement of Facilities
- \_\_\_\_\_ Provide More Student Internships
- \_\_\_\_\_ Increase Faculty Travel

In order that I may complete my doctoral dissertation research in a timely manner please respond as quickly as possible. A control number has been assigned so that I may track responses. Your response will be kept confidential.

Thank you,

Robert M. Kuhns

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APPENDIX C  
ERAU Survey (1996)

Dr. Daniel E. Johnson  
North Central Regional Faculty Advisor  
Embry-Riddle Aeronautical University  
55 MSS/DPE, 106 Peacekeeper Drive, Ste 806  
Offutt AFB, NE 68113-3214

December 26, 1995

Dear Colleague:

During the Third Annual Symposium on Teaching Effectiveness at the Extended Campus World-wide meeting last November, Dr. Rob Kuhns presented a paper entitled "Proposed Improvements in Collegiate Aviation Education." The study was based on a 1993 nation-wide survey of aviation education program directors of four-year non-engineering collegiate aviation programs. The research was divided into two primary parts. The first portion was the survey of aviation program directors mentioned above. The second part of the research project involved the ranking of various factors derived from the survey that comprise a quality aviation education. Dr. Flancher felt ERAU could benefit from this research and requested we replicate the second portion of the study in the Extended Campus and present the results at the 1996 World-wide Conference.

From the initial nation-wide survey of aviation education program directors, three key questions provided the data for the second part of the research. The most frequent responses from these key questions are paraphrased below. Please rank (1-12) the responses in order of importance (1 being the most important) and return your response to us in the enclosed self-addressed stamped envelope.

Statement: Factors of High Quality  
Aviation Education Program

Rank (in order of importance)

- \_\_\_\_\_ Concentration of Aviation Studies
- \_\_\_\_\_ Blend of Liberal Arts Curriculum
- \_\_\_\_\_ High Quality Faculty
- \_\_\_\_\_ Professional Program
- \_\_\_\_\_ High Quality Facilities
- \_\_\_\_\_ High Quality Students
- \_\_\_\_\_ Strong Flight Simulator Department
- \_\_\_\_\_ Academic Support
- \_\_\_\_\_ Good Overall Program
- \_\_\_\_\_ Networking with Aviation Industry
- \_\_\_\_\_ Student Job Placement
- \_\_\_\_\_ Student Oriented Faculty

Statement: Necessary Factors to Provide  
Excellence in Aviation Education

Rank (in order of importance)

- \_\_\_\_\_ Variety of Aviation Courses Offered
- \_\_\_\_\_ Professional Program
- \_\_\_\_\_ High Quality Facilities
- \_\_\_\_\_ Networking with Aviation Industry
- \_\_\_\_\_ High Quality Aviation Program
- \_\_\_\_\_ Academic Support
- \_\_\_\_\_ Adequate Funding of Program
- \_\_\_\_\_ Industry Involvement in Curriculum
- \_\_\_\_\_ Conduct Research in Aviation
- \_\_\_\_\_ Program Contain Interested Students
- \_\_\_\_\_ High Quality Faculty
- \_\_\_\_\_ Student Oriented Faculty

Statement: Proposed Improvements in Aviation Education

Rank (in order of importance)

- \_\_\_\_\_ Increase number of Hands On Activities
- \_\_\_\_\_ Improve Teaching Aids
- \_\_\_\_\_ Improvement and Addition of Flight Simulators
- \_\_\_\_\_ Increase Faculty Number
- \_\_\_\_\_ Increase Number of Available Aircraft
- \_\_\_\_\_ Improve Student Placement System

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- \_\_\_\_\_ Increase Number of Aviation Programs
- \_\_\_\_\_ Increase Student Recruitment
- \_\_\_\_\_ Increase Marketing Budget
- \_\_\_\_\_ Improvement of Facilities
- \_\_\_\_\_ Provide More Student Internships
- \_\_\_\_\_ Increase Faculty Travel

In order that we can complete the analysis of the data in a timely manner, please respond as soon as possible. A control number has been assigned so that we can track responses. Your response will be kept confidential.

Thank you,

Robert M. Kuhns, Ed.D.

Daniel E. Johnson, Ed.D.

**LEADERSHIP AND THE TRANSFORMATION OF VALUES**

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### **Executive Summary**

This article on leadership serves as an important point of entry to the understanding and teaching of values with the goal of improving teacher effectiveness. As a dynamic process, leadership can take many forms. Considerable attention has been given to this process in both formal and informal sources. In fact, the literature abounds with information relating to the numerous theoretical points of entry that are possible for exercising leadership. However, as described in what follows, there is a paucity of information pertaining to the linkage between values and leadership as the transformation of values. The central purpose of this article is to address the latter issues, especially from the vantage ground of values in the acculturation process, and their significance for the process of leadership. In so doing, the authors provide an analysis of the following: 1) Key transformational concepts of the shaping and reshaping forces; 2) The setting within the macro/micro environment; 3) Contributions of some past theories of leadership, and a prototype of transformational leadership; 4) Societal forces affecting the acculturation process, including nine values of acculturation; 5) Content analysis of the literature, involving four databases; 6) A working model of leadership, such as The Global Society for the Advancement of Leadership (GSAL); and 7) A key element in enhancing teaching effectiveness is that the teacher and the student work from a common understanding of each other's value base. It is the conclusion of this paper that there are common core values which are crucial to the educational process. Furthermore, this common value base is applicable to and can be transferred to the students in the process of teaching any subject in the Embry-Riddle Aeronautical University curriculum. The key elements in this transformational process are the ability to cope, the ability to interact, and the ability to apply the values.

## 1. SOME KEY TRANSFORMATIONAL CONCEPTS

It should be noted that the concepts relating to the transformation process of values are not new or novel, by any means. What is pertinent in this discussion is the application of the concepts to various situations and settings.

First, values provide the directional force whereby individuals are able to reshape their practices, sentiments, ideas, conventions and attitudes regarding their roles in achieving individual or organizational goals (Farrah, 1993). A foremost leader in the treatment of leadership, especially in political science, John MacGregor Burns (1978) states that the ethical imperatives crucial to transformational leadership include trust, commitment, integrity, credibility, charisma, inspiration, and purity of purpose.

Second, acculturation is the process of transmitting - actually, teaching - the cultural traits, practices, conventions, values, and sentiments within persons or groups of a nation. In Democracy and Education, Dewey (1916) laid the foundation for the acculturation process in education. Although the unabridged dictionary defines acculturation as "one group or persons of one culture adapting to the culture of another nation, or modification of an individual or group in one culture by borrowing and adapting cultural traits from another nation or different culture", the former idea of transmission is more appropriate for its importance to leadership.

Third, the concepts of shaping and reshaping, really the catalytic agents in the transformation of values, have historical antecedents in the literary works of Goethe. In German, Goethe wrote, "Gestaltung, Umgestaltung, Das ew'gen, 'Sinnes ew'ge Unterhaltung," or "Shaping - reshaping: The

eternal spirit's eternal pastime" (Schorer, 1958). Quite clearly, as Goethe and Jung, poet and psychiatrist respectively, noted, the concepts of shaping and reshaping are not new by any means (Schorer, 1958)! In contemporary usage, shaping refers to the external forces which converge on the individual. These forces which shape the individual emanate from the macro or micro environments of political, economic, social, religious, educational, or mass media sources of influence (Farrah, 1977). Thus, these sources, as it were, "set the stage" for the formation of the individual's value system (Farrah, 1972).

Conversely, reshaping involves the individual's response or reaction to these sources of influence. The response may be immediate or latent. For example, if the shaping forces come from the schools, then this influence is latent because of the delayed maturation process. Of course, the nature of the response is dynamically and reciprocally related to the individual's perception of the shaping values (Schorer, 1958).

Fourth, it is important to contrast the different styles of leadership inherent in the concepts of transformation and transaction. In the case of transactional leadership, the rationale for it involves the two factors of contingent reward, and management by exception (Bass, 1981). Whereas contingent reward leadership is regarded as an active and agreed-upon exchange (i.e., of objectives) between leaders and followers, the resultant rewards are a form of recognition from the leader for the accomplishment of the objective. In addition to this recognition, there may be bonuses or merit rewards (Bass, 1985). The crucial aspect here really is job performance. Thus,

if the leader clearly specifies the objectives that followers are to achieve, then rewards will be given for satisfactory performance. Here, one may infer that the more congruent the objectives or goals are between the leader and his or her subordinates, the greater will be the possibility of achieving mutually agreed-upon objectives.

As a result, the process is enhanced by further communications between the leader and followers, where formal or informal contracts specify the terms of the agreement for any work done, as well as the rewards to follow. The effective leader knows how to model the behavior desired so that he or she can live up to the role expectations of the followers. When the leader fails to fulfill these aforesaid expectations, motivation suffers. There could also be diminished feeling of trust and respect for the leader. In addition to the element of trust, Burns stresses the "pervasiveness" of transformational leadership, and that "It is an affair of parents, teachers, and peers as well as preachers and politicians" (Burns, 1978). These latter significant others also play dominant roles in the acculturation process or the shaping and reshaping of values - especially academic values.

In terms of the second factor of transactional leadership, there is the more passive style of management by exception. The dominant themes here rely on observing mistakes and not intervening until something has gone wrong. In passing, one notes that this passive style of management (i.e., "do things right" or there is intervention) is quite different in meaning than the leadership style which is dynamic and active (i.e., "do the right things"). This comparison by Bennis (1989) is an excellent contrast between the two styles of leadership, transactional in the

former instance, and transformational in the latter.

Therefore, management by exception is contextual in nature. For example, if something is going well, leave it alone! However, if the "know how" suffers or things are not done right, then it is time to take action to correct the situation or process. This kind of emphasis might be appropriate or efficient for more immediate goals or tasks, but, eventually, if the process of change and long-range planning are neglected, management by exception could well lower standards of excellence!

Fifth, transformational leadership is a different philosophy. Within this concept, there are these attributes of shaping and reshaping. As defined earlier, values then become the mainspring by which an individual is able to cope, to interact, and to apply those necessary elements of acculturation (Farrah, 1994). Herein, if one examines this concept currently known as leadership, training, and so on, one recognizes the weakness: the lack of an integrative approach which can be dynamic, active, and personal. The reader will note that, in order to avoid passivity, coping, interacting and applying are active verbs. In university founded longitudinal studies involving data-generated information from nationwide and European samples, beginning in 1977 and continuing to the present, Farrah (1977) identified these three verbs to describe an aspect of the reshaping process for the transformation of values. Therefore, it is incumbent upon those who deal with leadership and values to maximize the talents of others so that their experiences are meaningful in their lives (Burns, 1978).

Since transformational leadership is a dynamic process involving change of some kind, one begs the question: What is it that

the leader transforms as a shaping force in the micro environment? To the extent that he or she models this type of leadership, is it one or more of the following qualities that are transformed: trust, commitment, integrity, credibility, charisma, inspiration, influence, or purity of purpose? If indeed these personal qualities can be transformed, then the latter may act in concert to produce a difference. For example, if the leader transforms commitment, then it can be inferred that commitment produces a difference in credibility and *vice versa*!

Suppose for instance, that the shaping force happens to come from the mass media (where there is often distortion in meaning), how does the individual transform that information so he or she can reshape the phenomena for meaning to him or her? There are also the various obvious distortions that come from political leaders who use their campaigns for shaping public opinions. It is crucial for the person involved to have the abilities and skills that are inherent in the interaction process to reshape this phenomena also. Within this context, the individual, often caught in a maze of conflicting values, is unable to deal with change, stress or unfavorable conditions.

## 2. THE SETTING WITHIN THE MACRO/MICRO ENVIRONMENT

In order to better understand the macro/micro environment, it is important to recognize the shaping forces and the setting that have characterized the *Zeitgeist* (i.e., spirit of the times) in this rapidly fading century (Spengler, 1939). For such activities, as the appreciation of the humanities to making a living, or to just being able to survive within the confines of inner cities, are characteristics of this century. Spengler (1939), a historiographer, used three prototype cultures for his historical content and treatment of the Appolinian, Faustion, and Magian with an emphasis on the shaping forces within each culture.

Another noted historiographer, Arnold Toynbee (1947), examined the cultural risks associated with a growing materialism, hedonism, a loss of purpose, and an erosion of values. In his historical analysis, Toynbee borrows two important concepts from modern behavioral psychology: stimulus and response. In this succinct abridgment, Toynbee uses the thesis of "challenge" and the antithesis of "response" - or shaping and reshaping respectively - in his historical analysis of 26 civilizations. From Toynbee's vantage ground, it is quite clear that a civilization survives when it is able to respond to the challenges confronting it. He uses the Eskimos as an example of a surviving civilization because of their ability to cope with the dangers of a harsh environment and limited resources. The daily struggles of the Eskimo to survive are so intense that little time remains for leisure activities, such as music, art, or other areas of the humanities. Instead, survival at all costs is the key issue.

Is this factor of survival, albeit for different reasons, also an issue today?

For example, within the twentieth century, consider the tremendous shaping forces and upheavals in matters political, economic, cultural, and intellectual. Shifting from a rural, agricultural society to an expanding, industrial economy, our country had been experiencing the pains of a changing society. There have been cyclical economic booms and depressions of unparalleled magnitudes, as well as devastating wars, revolutions, alarming examples of nationalistic and racial intolerance (Beard and Beard, 1939). Finally, there has been extensive experimentation in art, music, and literature.

One may note that, in a way, reshaping occurred in this manner: new approaches seriously questioned time-honored traditions, institutions, and dogmas. The reshaping of values involved new perceptions about the vastness of the universe, subatomic physics, the insignificance of life, quantum theory, non-Euclidean Geometry, relativity, nuclear energy, the "Alpha Helix" of Linus Pauling, and the "Double Helix" of Watson and Crick, which greatly contributed to the science of molecular biology and the discovery of DNA.

Finally, much precision is lost and a deeper awareness of the acculturation process is sidetracked if the term "culture" is used to describe a particular group or setting. Nevertheless, this interpretation of culture is very popular and appears in serious and, not so serious, writing. Rather than specifying certain practices, folkways, or conventions that are characteristic of the particular group involved, one notes references made to a

“thick” or “thin” culture, or the group being more or less homogeneous in purpose. This meaning has been applied in the business world, in educational institutions, and in a variety of other settings. The utilitarian use of culture completely ignores the various societal levels of behavior or responding mechanisms. In the context of this paper, the concepts of values, ideas, folkways, mores, practices, and sentiments are viewed as ways of describing activities *within* a culture.

The aforesaid concepts are by no means all-inclusive. Rather, these clarifications are utilized to provide the reader with a clearer understanding of their use in this article. In the next section, the authors describe some past theories of leadership.

### 3. CONTRIBUTIONS OF SOME PAST THEORIES OF LEADERSHIP

While more informal sources were previously cited in order to clarify the key concepts of transformational leadership, the following affords an analysis of some contributions from the literature that pertain to the transformational processes of shaping and reshaping. In particular, the sources reviewed are those which are especially pertinent to the important role that values have in the acculturation process. We conclude this section with a discussion of a special prototype of the transformational leader *par excellence* -- Mahatma Gandhi.

Although there are over 350 theories of leadership (Bennis and Nanus, 1985), often intermixed with the concept of management, there has been a blurring of the underlying differences not only in leadership, but the contrast between leadership and management. One gathers from this abundance of material that, while manpower is considered a resource, the primary concern of management is having adequate personnel to perform the task at hand. In management, the motivation techniques concentrate on pay and benefits, a form of *transactional leadership*.

On the other hand, transformational leadership addresses achievement of objectives on a more individual level. Therefore, leaders attempt to motivate their personnel in a completely different manner. They may apply methods beyond mere job satisfaction, such as team building in order to inspire workers to become more actively involved in accomplishing organizational goals.

For example, during a ten year period, Farrah (1993) interviewed over 400 U.S. air force officers in order to determine their salient style of leadership. One of his conclusions was that management has a

mechanistic quality as opposed to the creative aspects of leadership. The former is characterized by "know-how" and the latter by "think-how". Whereas the authority of management can be delegated, the responsibility of leadership cannot be. The real crucial difference between leadership and management requires a review of the core processes involved. Management functions, for example, include planning, organizing, directing, coordinating, controlling, budgeting, staffing, and problem solving. On the other hand, concerning especially the idea of transformational leadership, one finds the need to establish direction for personnel: aligning people, motivating and inspiring workers.

Many experts in the field have categorized leadership in the affective domain, so that qualities such as spirit, personality, and vision are integral characteristics. In another vein, management belongs to the domain where mind calculation, routine - those mechanistic functions - are paramount. Contrasted another way, consider the following split-page technique (Bennis, 1989):

Manager

Administers

Maintains

Focuses on system and structure

Relies on control

Does things right

Leader

Innovates

Develops

Focuses on People

Inspires, trusts

Does the right thing

As can be seen, regardless of what characteristics are ascribed to either a manager or leader, there is agreement that these are dominant themes for each group.

Early in this century, John Dewey, the distinguished educational philosopher, provided insights into the process of acculturation, especially in the world of educational thought. In 1916, he lucidly describes how values, traditions, practices, and conventions were transmitted from generation to generation in complex civilizations. In Democracy and Education, he maintained that a civilization is “too complex to be assimilated *in toto*.” Rather, “It has to be broken up into portions, as it were, and assimilated piecemeal, in a gradual and graded way” (Dewey, 1916).

A second significant landmark in the definition of mission and values of acculturation also occurred during Dewey’s era - about 75 years ago. It was during this time that many educators began to urge a reorganization of the curriculum in order to give more continuity and unity to the students’ programs. Accordingly, the Commission on Reorganization of Secondary Schools issued its famous seven *Cardinal Principles of Secondary Education*.

Historically, it was an appropriate time for both the specializing and unifying characteristics of these objectives or *values*, because they were really the appraisal of the *worth* of the secondary curricula at that time. Consider these changes and attributes which were typical then of American society: steam power had exceeded sail power; America had become a world power; and the cancer of racism was (and still is) very much a part of the societal mores. The influx of immigrants at that time increased heterogeneity and diversity as decisive factors in societal life, and it has continued to the present day.

Therefore, it was fitting and timely for the Commission to develop these secondary school objectives (i.e., *Cardinal Principles of Secondary Education*): 1) Health; 2) Command of fundamental processes; 3) Worthy home membership; 4) A vocation; 5) Civic education; 6) Worthy use of leisure time; and 7) Ethical character.

David Riesman, in collaboration with Ruell Denny and Nathan Glaser, employed the concepts of “inner-directedness” and “other-directedness” in describing a changing American character in the period immediately following the Second World War. His book, *par excellence*, written in 1950, discussed topics from “types of character and society” to “autonomy and utopia” (Riesman, 1950). This work provided new insights into social/psychological phenomena and the interpretation of values. For example, the concepts of inner-directedness and outer-directedness were recast into a dichotomy between the shaping forces of a macro environment versus the reshaping forces of an individual within the micro environment. Thus, even though Riesman’s aforesaid concepts are not exactly similar, it is his idea of other-directedness versus inner-directedness that corresponds to the “shaping versus reshaping” forces. There is no implication of “right” or “wrong” in their usage.

Between the years of 1979 and 1984, nationwide field studies were conducted by Robert N. Bellah and four associate scholars (1985). In effect, this team of researchers combined both the methodology of interviews with participant observations of 200 persons. The American values they explored cut across the personal characteristics of gender, age, social status, and geographic location. These values

which they explored centered on the dominant themes of *pursuit of happiness, culture and character, reaching out, and getting involved*. As revealed by the extensive, descriptive data from their sampling, it was quite clear that America was experiencing a growing trend toward diversity or heterogeneity of personal values.

In summary, the literary sources quoted in this section reveal several dimensions or dominant themes associated with the global variables of leadership in relationship to the transformation of values. These are:

- That there are some longitudinal studies, both descriptive and data-generated, associated with the subject of values or character development in America.
- That some poets, historians, psychiatrists, philosophers, and social scientists - within their own disciplines - have treated the phenomena of shaping and reshaping forces in either general or esoteric ways. Therefore, it should not be surprising to note that, in only one instance, the Commission Publication of 1918 (i.e., which developed the seven *Cardinal Principles of Secondary Education*), directly deals with values as they affect the acculturation process!
- That the important concepts of shaping and reshaping, as a special case, have precedence in the assertions of John Dewey regarding the learning of values, traditions, practices, conventions, and other aspects of acculturation; and regarding the vital connection between free, public education and democracy.
- That the work of Riesman and his associates provided unique interpretations of the *directional force* of values either via inner or other-directiveness.
- That the rapid changes and growing trends toward diversity and heterogeneity of contemporary America were eloquently described by Bellah and his team of social science experts; and for an earlier period of our history, by Beard and Beard, the most perceptive historians who accurately felt the pulse of the times; and
- That there is a crucial difference between transactional and transformational leadership. Very briefly, many astute scholars as Bass, Burns, Covey, Tracey, Yammarino, Zaleznick and so many others who cannot be included in this limited space have observed or tested the dominant themes of transformational leadership. For example, they discovered that this type of leader can broaden and thus maximize the talents of their subordinates by generating awareness and acceptance among the subordinates toward the purpose and mission of the group. They know that this unique leader can motivate others to go beyond their own self-interests for the good of the group.

In order to provide a vivid illustration of the tremendous potential of transformational leadership and its effects on values, it is now appropriate to consider the example that was set by Gandhi - leader *par excellence*!

### 3.1 A Special Prototype of Transformation Leadership: Mahatma Gandhi

Mahatma Gandhi has become known to millions around the world for his purity of purpose and dedication to a cause -- perhaps the mainspring to any transformation. However one may ask, how is it that this shy, awkward, at one time lawyer, employed basic values as a new vision for India? Imagine this eventual leader turning his back on his modestly wealthy family and comfortable situation in order to reach out to the teeming millions: the homeless, destitute, and untouchables. A freelance, political journalist, Vincent Shehan (1954) became acquainted with Gandhi and later wrote a biography about him. The facts or events presented here about Gandhi's life and political struggles were extracted from Shehan's masterful account.

Gandhi's ethical imperatives were rooted in the great Hindu poem "Bhagavad-Gita" and the Sermon on the Mount. One imperative was most important to him: the value of being good and of living the good life. In this instance "good" for Gandhi involved other key imperatives. For example, there were the Sanskrit words for voluntary sacrifice which Gandhi's cousin Maganlal had used: *sat* or truth, and *agraha*, which is firmness or force. By combining, for the very first time, these potentially powerful and dynamic concepts, Gandhi converted them into one expression -- *satyagraha*!

In setting the transformational stage for the masses in India - both Hindu and Moslem - Gandhi's style of leadership provided an easier, more comprehensible way of understanding his struggle for freedom. Imagine the tremendous impact of these imperatives and ideas; they eventually took root and grew, and grew, and grew.

With the liberation of India, pax Britannia, "where the sun never set on the Union Jack", would never be the same again.

Of course, this independence was his ultimate achievement. There were other values that contributed to this aforesaid achievement. For example, as a model for others to follow, he believed that a purity of purpose, unadulterated by ego or self-centeredness, was a crucial responsibility for the leader. Thus, via his frequent fasting in order to achieve a goal, this "self-purification" in turn was also regarded as the purification by his thousands of followers. Therefore, if Gandhi fasted, they, too, at his signal and appropriate time, also fasted.

His imperatives and achievements in this transformation process are valuable guidelines for those of us living in a world of uncertainty. In addition to the aforesaid value of *satya* or truth, Gandhi was also motivated by the value of *brahmacharya*, which is self-control or chastity.

At this stage of our history, the waning decade of the twentieth century, the implication of Gandhi's values for transformational leadership are profound. Most importantly, in retrospect, if Gandhi could accomplish so much with so little, how is it that leaders today, with many greater resources, experience difficulty in achieving their goals? Is it any wonder that Lord Halifax, who personally dealt with Gandhi as viceroy from England, had the highest regard for him, characterizing Gandhi as "the little man" who had never broken a promise (Shehan, 1954).

Therefore, there can be little doubt of the dynamic relationship that values have with commitment and credibility, especially in that relationship between the leader and

those who follow. Therein is the crucial factor: the leader is *supra personal*, beyond his or her own intrinsic, immediate needs, and the latent, extrinsic objective is most paramount.

The living proof of Gandhi's transformation can be seen in the revolutionary model of Martin Luther King in his policy of nonviolence. Quite clearly, in a transformation process, Gandhi's leadership - often in the face of self-doubt and challenges from his adversaries - produced a difference in credibility and commitment.

It is evident from this illustration of Gandhi that he entertained many self-doubts regarding his own efficacy in helping his fellow man, Hindu or Moslem. However, he treated both with the same compassion; his ultimate success could not be divorced from these actions. Gandhi and those possessing this magnificent vision tell us that this is not a historical oddity, a product of the moment, or a passing fad. Historically, the leaders, dreamers, and rebels have transformed organizations, nations, and peoples with the power of their values and vision.

As a narrowing emphasis, the remaining sections of this article describe our research efforts to formulate and actualize the process of transformational leadership.

#### **4. SOCIETAL FORCES AFFECTING THE ACCULTURATION PROCESS**

For the past twenty years, one of the authors has conducted research through interviews and surveys in the United States, Europe, and other parts of the world. The primary focus was to study societal forces affecting the shaping and reshaping of values in the acculturation process. This section outlines crucial knowledge gleaned from this extended research, the nine values of acculturation, how these nine values become operational in coping, interacting, and applying skills, and a factor analysis of the shaping and reshaping forces.

From sampling numerous participants in the study (Farrah, 1993), a set of nine basic values emerged as “the most significant” values of acculturation. This set is independent of educational level, work choice, age, gender, and location demographics. These nine values are intimately associated with: 1) success; 2) self-confidence and being understood; 3) reaction to failure; 4) coping with change; 5) experiencing the new or different, diversity; 6) service, honesty, and helping others; 7) coping with self-doubt; 8) understanding the application of knowledge; and, 9) the work ethic. Knowledge of this set of values is extremely beneficial to students, parents, counselors, administrators, as well as business and government leaders, because these values are fundamental to the development of a sense of responsibility within the reshaping forces of one’s inner-directedness. For example, teachers who have utilized this set of values reported that students have benefitted from problem-solving situations in which they are aware of the clear relationship of what they are asked to do in terms of their own goals. Crucial to the process of goal attainment and personal

investment have been the students’ own participation in planning, decision-making, and self-evaluation. This think-how process supplements the more traditional know-how, where flexibility and alternative learning styles have been limiting. Assuredly, the students who adhere to these academic values of acculturation can be rewarded in like measure for their efforts; those who do not, can be at-risk academically and socially.

These nine values become operational in the forms of coping, interacting with others, and applying knowledge and skills in real-life situations. Most importantly, these latter forms of reshaping characteristics are related and can be traced to each of 24 items contained in the Survey of Academic Values (SAV) given in Figure 1. See Farrah (1994) for the administration, scoring, and interpretation of the survey instrument.

The first theme of coping has the largest cluster of items (i.e., items 3, 4, 5, 11, 14, 15, 16, 17, 22 and 24). These items indicate how a person copes with success, failure, change, experiencing something new or different, and self-doubt in his life. In a world and nation full of uncertainty and ambiguity stemming from many shaping forces (i.e., government, economics, mass media, and cultural aspects), so many find it difficult or intolerable to cope with these forces.

In the second cluster, there are two themes that reflect the ability of the person to interact with others. These themes incorporate the importance of self-confidence and of being understood, as well as the values of service, honesty, and helping others (i.e., items 1, 2, 6, 8, 9, 12, and 13). Unquestionably, if an individual does not feel good about himself or herself, it will be difficult to relate or to help others.

For the third cluster, the two important themes of applying knowledge or skills, and work predominate (i.e., items 7, 10, 18, 19, 20, 21, and 23). Since these two crucial values do not exist in isolation, young people must experience *bona fide* experiences in the work world in order to learn the value of applying knowledge. It is not enough to experience the know-how skills in learning situations or to regurgitate information as though the past were entirely prologue; more important are skills associated with think-how in order to apply knowledge for both the present and the future.

Figure 2 shows the operational characteristics of transformational leadership in relationship to the reshaping process of coping, interacting, and applying. Also illustrated in this figure is the intermix of the 24 survey items with the latter three elements of the reshaping process. The dichotomy between the immediate-intrinsic versus the fulfillment-extrinsic characteristics relevant to the reshaping process is as follows:

Intermediate-Intrinsic

- A. Evaluated competition
- B. Tasks/projects
- C. Discovery/creativity
- D. Skills

Fulfillment-Extrinsic

- e. Aspiration
- f. Cooperation/conformity
- g. Responsibility
- h. Acceptance/praise

Note the considerable overlap in the relationships; there are no quick or easy ways to cultivate or improve the values of a person. Nevertheless, creative, productive,

rewarding, and purposeful activities, guidance and counseling can be designed in such a way that coping, interacting, and applying skills are holistically enhanced.

Another important dimension of this study on values was an assessment of shaping and reshaping forces of students who range from high school to university level. In the case of shaping from the external or macro/micro environment, it is assumed that the individual has little or no control over such factors as gender, grade, location, risk, or cultural aspects. Conversely, in reshaping the social-psychological impact of the external forces, it is assumed that the individual reacts with his or her total being in terms of traits, habits, abilities, practices, and those attributes that comprise the total personality. Thus, an individual does have some control over the kinds of responses which he or she makes to those external forces.

In order to bridge the gap of the reshaping forces or inner-directedness (i.e., how the individual reacts to external forces) to the shaping forces or other-directedness (i.e., converging on the individual), assessments were made via two inventories simultaneously applied: The Survey of Academic Values (SAV) and The American Way of Life (AWOL) (See Farrah, 1977). As measuring instruments, the items of SAV are latent, intrinsic-fulfillment aspects of the acculturation process; in contrast, the items of AWOL are characterized as those which emanate from shaping forces and are immediate, and extrinsic-fulfillment, those characteristics of everyday life.

An analysis of the data indicated that there were significant differences or measures of relatedness among external factors corresponding with the shaping forces: group (location or school), risk

(versus non-risk), gender, grade, and cultural aspects; and three internal factors corresponding with reshaping forces: self-adequacy, personal investment, and goal needs.

Figure 3 provides the results of factor analysis. The five external factors accounted for approximately 84% of the variance; the remaining internal factors accounted for 16% of the variance. Note that the three factors of group, risk, and gender accounted for about 63% of the variance.

This section described societal forces affecting the shaping and reshaping of values in the acculturation process. In the following section, the authors describe a content analysis of the literature to assess the occurrence of these nine values of acculturation using abstracts from four data bases.

## **5. CONTENT ANALYSIS OF ABSTRACTS FROM FOUR DATABASES**

The vast amount of literature at all levels of the educational continuum is, in itself, a potent shaping force for determining both the quality and quantity of content material to be taught. In order to assess the presence or frequency of occurrence of the nine values of acculturation within the categories of leadership, coping, interacting, and applying, four data bases were selected through the Learning Resource Services of St. Cloud State University. These sources included: ERIC CD-ROM Database, PALS (Project Automated Library System), PSYCHLIT CD-ROM Database, and the ABI INFORM Business Database.

This search was conducted using the following five keywords: leadership, values, coping, interacting, and applying. In a double-blind experiment, three reviewers--all professional educators from different disciplines evaluated these abstracts with two objectives in mind:

1. Determine the number of abstracts from the four data bases containing the three reshaping forces of coping, interacting, and applying; and
2. Determine the frequency of occurrence of the following nine basic values of acculturation as they apply to coping, interacting, and applying:
  1. Success
  2. Self-confidence and being understood
  3. Reaction to failure
  4. Coping with change
  5. Experiencing the new or different, diversity
  6. Service, honesty, helping others
  7. Coping with self-doubt
  8. Understanding the application of knowledge
  9. Work ethic

This cross-impact analyses of abstracts produced some interesting results. In terms of the first objective, it was discovered that from the vast reservoir of information of over 400,000 entries contained in all four data bases, there were less than 100 identified abstracts within the 10-year interval from 1985 to 1995. Apparently the three reviewers found that the ERIC Database is the most productive. Since the ERIC Database contained the most abstracts, it was not surprising to expect a larger number of abstracts can be found related to the keywords used for identification.

The contingency analysis given in Table 1 summarizes the occurrences of coping, interacting, and applying as identified from the cross-impact analysis of the four databases. Results of the analysis show that there is no evidence of a relationship in the four major databases and the response system of coping, interacting, and applying.

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**Table 1** Content Analysis of Database Abstracts

	Coping	Interacting	Applying	Total
ERIC	89 82.0	93 97.0	86 89.1	268
PALS	4 6.7	11 8.0	7 7.3	22
PSYCHLIT	11 14.7	19 17.4	18 16.0	48
ABI INFORM	0 0.6	0 0.7	2 0.7	2
Total	104	123	113	340

Chisquare 8.509  
p-value 0.203

For the second objective, the reviewers focused their attention on the cross-impact analysis of the set of nine values versus coping, interacting and applying. As indicated in Table 2, they collectively tabulated a total of 924 for the above analysis. One observes that the column totals were evenly divided with approximately a third falling into each category of coping, interacting, and applying.

However, in terms of the nine values, the row totals reveal some dramatic findings. For example, the three values having the fewest entries are Number 3, Reaction to failure (i.e., 39 or 4 percent); Number 7, coping with self-doubt (i.e., 42 or 5 percent); and Number 9, Work ethic (i.e., 68 or 7 percent). Otherwise, the remaining six values accounted for 84 percent of the total; all six were evenly divided with a range of 13 to 15 percent.

Finally, we note that three reviewers, coming from diverse backgrounds and geographical locations, agreed, for the most part, in their selections of the nine values associated with the characteristics of transformational leadership. The next section illustrates a working

**Table 2 Selections Made By A Panel of Three Educators**

<i>Values</i>	<i>Response Pattern</i>			<i>Total</i> (In Percent)
	Coping	Interacting	Applying	
1. Success	38	40	41	119 (13)
2. Self-confidence and being understood	48	50	44	142 (15)
3. Reaction to failure	5	18	16	39 (04)
4. Coping with change	47	51	44	142 (15)
5. Experiencing the new or different	41	41	39	121 (13)
6. Service, honesty, helping others	38	40	38	116 (13)
7. Coping with self-doubt	16	14	12	42 (05)
8. Understanding and application of knowlegde	44	46	45	135 (15)
9. Work ethic	24	22	22	68 (07)
Totals	301	322	301	924
In Percent	(33)	(34)	(33)	(100)

## 6. A WORKING MODEL OF LEADERSHIP

Within the organizational structure of a university, there are ample opportunities to enhance the role of leadership in the student's academic experience. In order to actualize the many possibilities that may exist in this setting, the Global Society for the Advancement of Leadership (GSAL) was organized at St. Cloud State University (SCSU). Accordingly, this section describes the development plans and provides an example of its activities.

During 1994, two of the authors developed the initial stages of organization, which included a constitution, by-laws, and other elements necessary for both a functioning organization and for approval by the Student Senate of SCSU. Since the process of transformational leadership involves a broad base of knowledge via an interdisciplinary approach, the primary objective of GSAL is to foster experiences that provide undergraduate and graduate students with a variety of options and conceptual tools.

In addition, by providing first-hand experiences of observing, interacting, and participating in the dynamics of the leadership process, students can better internalize concepts, generalizations, and relationships. It is really not enough to rely on courses and textbooks *about* leadership, although there may be some merits to the more traditional approach. This latter, passive curriculum lessens the need to combine and integrate direct leadership experiences in the field where students can learn by direct observation and interaction with those involved.

Therefore, the scope and direction of GSAL involves some important conceptual fundamentals in the process of acculturation. There are, for example, these features within the conceptual framework.

- A. The Acculturation Process of Reshaping
  - 1. The immediate-intrinsic aspects concern such items as evaluated competition, tasks or projects, discovery, creativity, and transformational leadership skills.
  - 2. The fulfillment-extrinsic aspects involve the elements of aspiration, cooperation, conformity, responsibility, acceptance, praise, and transformational leadership skills.
  - 3. The operational characteristics feature the important processes of reacting to the multitude of shaping forces via the skills of coping, interacting, and applying them to transformational leadership.<sup>1</sup>
  
- B. Intervention Techniques: Transforming the Students' Skills of Coping, Interacting and Applying.
  - 1. The Student Portfolio was created in order to provide them with a voluntary method of informally evaluating his/her own academic values. As described earlier in this article, utilizing first the appropriate survey form and then transferring their responses to a profile form, students are able to assess their own strengths and weaknesses in terms of the significance they attached to the items. With the help of the teacher,

- counselor, parent, professor - in brief, those significant others in their lives - they can plan episodes to improve their values.
2. Linking GSAL to the community setting is an integral part and activity of transformational leadership. Fortunately, an ideal community was located which is familiar with the goals of GSAL. At Bensen Senior High School, under the dynamic leadership of Mr. Ray DeBoer, Curriculum Director for the school district, a visitations were made by several members of GSAL to interact with members of the community and leaders in the business community. For example, via these visits during March of 1994 and November of 1995, the leaders of GSAL along with students from foreign countries, were able to learn important characteristics of the transformation process. They were to learn the important characteristic that James MacGregor Burns referred to as "The elevating power of leadership" - in this instance, *the crux of transformation*. Thus, they were able to learn by dynamic interaction and observation how a small rural farm community was successfully able to raise the necessary capital for expanding a local industry which will create the need for 100 new employees. For this endeavor, they learned the importance of Gandhi's "purity of purpose", another characteristic of transformational leadership. For example, via the supra personal cooperative efforts of city officials, the local banks, the governor, and citizens themselves, this innovative effort was a success. Since the sale of bonds was an integral part of fund raising activities, citizens contributed to the effort by purchasing bonds.

Quite clearly, as noted from the above example, a linkage to the community is an important intervention technique which buttresses classroom learning by episodic learning. The implications derived from the aforesaid topics and from the GSAL are believed to be important for the process of transformational leadership. These implications are considered next.

## 7. IMPLICATIONS FOR LEADERSHIP IN THE TRANSFORMATION OF VALUES

There are many implications which emerge from this study of the linkage between value and leadership. First, it may be possible to use this work as a basis for creating a heightened awareness of the acculturation process in relationships to values and its importance to transformational leadership. For example, in order to bridge past experiences with the present and to emphasize the latent qualities of schooling at all grades or levels, the nine values which have been identified would become an integral part of teaching all courses in the public school curricula. Thus, rather than merely adding in courses stressing leadership, this holistic approach would incorporate those salient features or characteristics of transformational leadership in order to maximize the talents of individuals within any content area, be it science, literature, or the social sciences.

Second, even though there have been hundreds of definitions associated with the process of leadership, the vital role of values has *not* been a dominant theme. Therefore, to the extent that these many definitions embrace the values of acculturation, transformational leadership can play a significant role in reshaping the individual's patterns of behavior.

Third, in terms of behavioral patterns, transformational leadership involves traits, habits, practices, and sentiments that vary in focus and direction in contrast to important managerial tasks or duties.

Fourth, the dynamic twentieth century has yielded several longitudinal studies from various disciplines that detail, describe or interpret the vast phenomena that entail the shaping and reshaping mechanisms or

techniques among various cultures - especially Western culture. Therefore, the ideas associated with transformational leadership, expressed in various ways, are really not new ideas. Yet, the value content - for good or evil - are the catalytic means for the process of reshaping.

Fifth, although the content analyses of the literature involving four databases was a pilot study, the thirty-one abstracts revealed sufficient entries for the cross-impact analyses. Here, it should be noted that the addition of each keyword (i.e., values, leadership, coping, interacting, and applying) entered into the databases search, thereby reduced the available sources containing these specified keywords. In contrast, entering only one keyword at a time would, perhaps, increase the likelihood of finding additional sources; but this procedure would defeat our holistic approach to the experiment. Nevertheless, despite the small number of abstracts, the aforesaid intermix of values with the response system yielded vital information. For example, leaders must address the unrealistic views held by so many toward the values associated with failure, self-doubt, and the work ethic.

Sixth, in order to improve teacher effectiveness, maximization of talents must cut across gender, group age, race, and location. Surely, the values that are related to firsthand experiences are dynamic, personal, and active, thus enhancing the process of transformational leadership. Episodic learning using these concepts can be developed for a number of settings in the macro- and micro-environments. The prototype provided by the Global Society for

the Advancement of Leadership is only one of many such opportunities or possibilities that can be innovated by leaders. The episodes related to firsthand experiences that are dynamic, personal, and active enhances the process of transformational leadership. These episodes can be developed for a number of settings in the macro- and micro-environments.

Quite clearly, the shaping and reshaping forces are crucial elements throughout the individual's life span. Apparently, transformational leadership *affects both forces*, but the process is especially significant in the skills of coping, interacting, and applying. Leaders must stress the importance of these two dynamic forces.

Seventh, if the ultimate concern of the leader is to help transform values for the themes noted above or other important ones, then transformational leadership offers the highest probability of success. Most important, the probability is enhanced because the process is characterized by an emphasis on coping, interacting, and applying, and by a genuine concern for people as individuals as well as for the organization as a whole.

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Figure 2

# Operational Characteristics of Transformational Leadership

## Key to Symbols

**Immediate-Intrinsic**

- A. Evaluated Competition
- B. Tasks / Projects
- C. Discovery / Creativity
- D. Skills

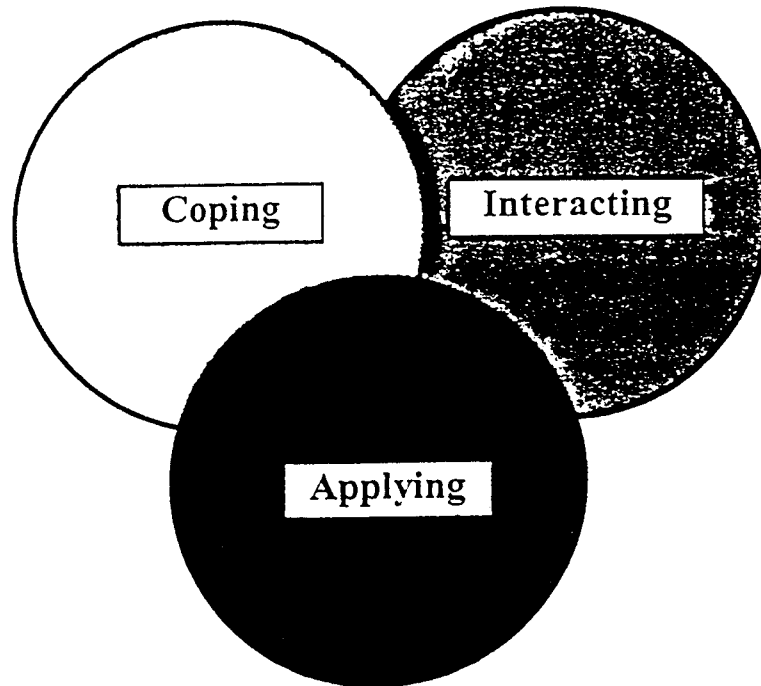
-Versus-

**Fulfillment-Extrinsic**

- e. Aspiration
- f. Cooperation / Conformity
- g. Responsibility
- h. Acceptance / Praise

### Items in Each Category

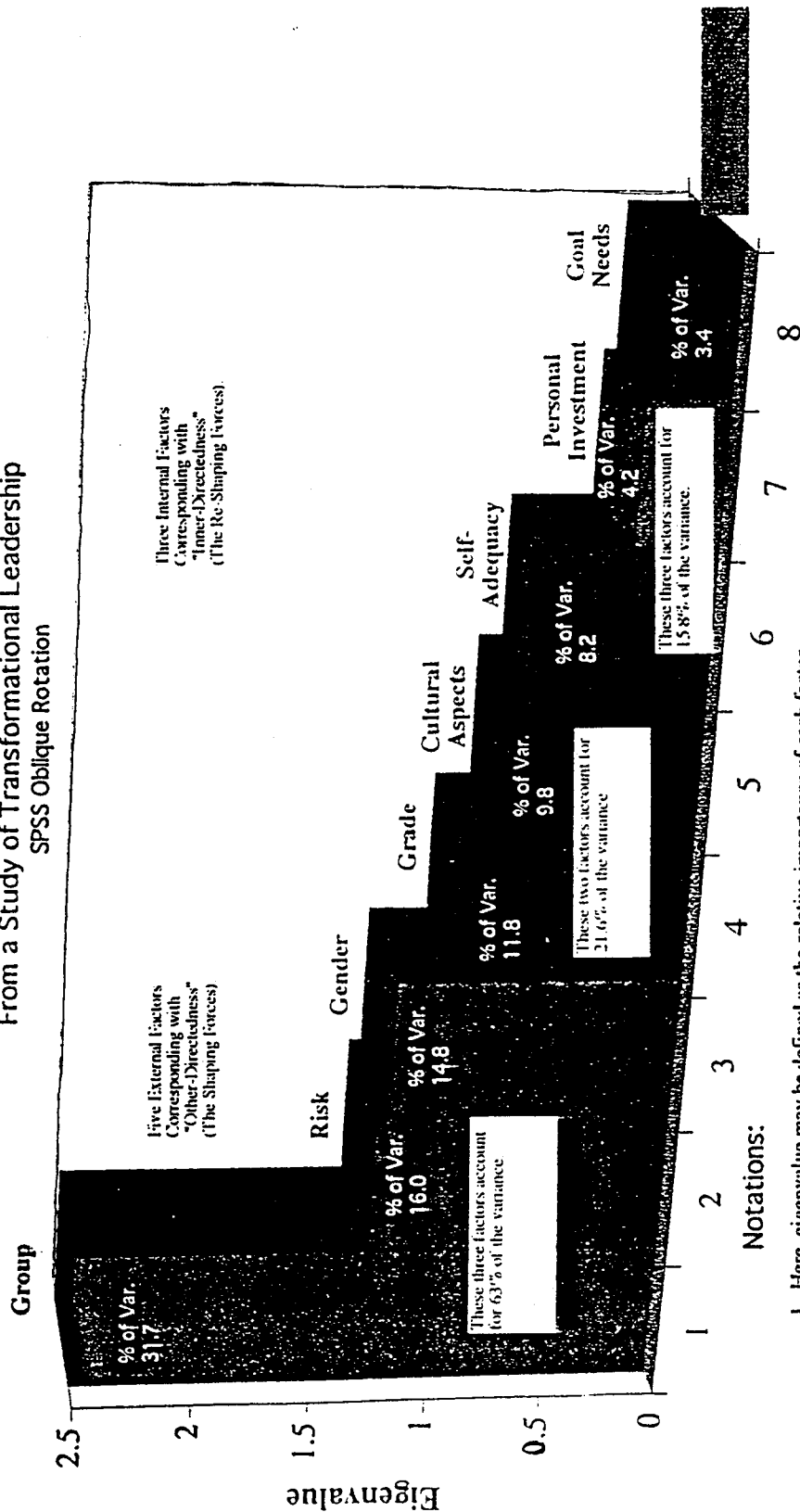
						Total
I. Coping Skills	A=5	C=2	D=1	g=1	h=1	(10)
II. Interacting Skills	B=1	C=1	e=1	g=1	h=3	(7)
III. Applying Skills	B=2	D=1	e=3	f=1		(7)
Total =						(24)



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Figure 3

**Factor Structure Matrix**  
From a Study of Transformational Leadership  
SPSS Oblique Rotation



1. Here, eigenvalue may be defined as the relative importance of each factor.
2. The sum of the eigenvalues is a measure of the total variance of all 8 factors.
3. The principal component analysis extracted factors 1, 2, and 3.
4. Since factors 6, 7, and 8 overlap, their eigenvalues may be totaled for 15.8% of the variance.

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Factors 5 to 8 inclusive are from his copyright inventories, AWOL and SCAMIN.

**Involving Adults in the Learning of Mathematics**

by

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**Abstract**

Preparing adults for the mathematics skills necessary for the twenty first century is a challenge. It is especially challenging if those adults have had past traumatic experiences learning mathematics. Involving students in the learning process involves more than the presentation of mathematical concepts by the teacher and the simple regurgitation of rote memorization by the students. It requires a concerted effort by both the teacher and the student. The teacher must present mathematical concepts that are inclusionary, challenging, in an environment created for learning, in class settings that are technologically advanced, and geared to the student's level. The student must assimilate the information through cooperative learning exercises and writing assignments, which incorporate the learning objectives of the current class and the ideas learned in previous classes.

## **Involving Adults in the Learning of Mathematics**

I begin each mathematics class with the same question: "Who in this class would consider themselves 'math-phobic'?" Invariably about 90% of the class raise their hands. (I have always suspected that the other 10% would like to, but are afraid of something!) After I survey the response, I usually ask one of the students how much one apple would cost if two apples cost \$1.00. "Fifty cents," exclaims the student, "but *that* was easy!" My response is always the same: "That was *mathematics!*"

After some classroom discussion, we generally come to the realization that it isn't the mathematics that frightens the students, rather it was some teacher (disguised as an educator, parent or other tutor) who showed some form of disgust (anger, frustration, etc) when an immediate response wasn't forthcoming from the student. These students aren't math-phobic, they are *teacher-phobic!*

Teachers of mathematics are, perhaps, the most likely to spread "teacher-phobia." The question, then, begs to be answered: "What can I do to help my students overcome teacher-phobia?" "How can I ensure that I am not the cause of *teacher-phobia?*" The answers to these questions may seem like common sense, but to paraphrase Rousseau, common sense isn't all that common.

The National Council of Teachers of Mathematics (NCTM) must have had this growing gulf of math anxiety and rampant spread of teacher phobia in mind when it developed its goals for the teaching of mathematics. These goals are designed to replace the rote memorization of mathematical rules and concepts with innovative, interactive activities which help

not only to develop the concepts, but also to anchor them in the minds of the students. This process of cooperative learning creates a fresh environment in which students begin to realize that learning mathematical concepts is not an impossible task, and can even be exciting.

The NCTM encourages teachers to emphasize the learning of the value of mathematics, build confidence in the students' ability to do mathematics, perform problem solving techniques, reason mathematically, and to communicate their knowledge of mathematics both orally and verbally (NCTM, 1989).

The accomplishment of these goals were not left to chance. In 1991, the NCTM published the "Professional Standards for Teaching Mathematics" which, according to Showalter,

recommends that teachers select interesting and intellectually stimulating mathematical tasks, present opportunities for students to deepen their understanding of mathematics and its applications, promote the investigation of mathematical ideas, use technology to pursue these investigations, find connections to previous and developing knowledge, and employ cooperative-learning experiences (p. 5).

While the NCTM's focus is primarily on the development of the mathematics skills of K - 12 grade students, the lessons and guidelines serve as intelligent guideposts for anyone teaching these necessary, yet often frustratingly confusing, skills. These goals represent the collective thoughts of the literally thousands of years of NCTM's

members' teaching experience, and focus on the student's ability to achieve rather than memorize.

The NCTM is not the only mathematics organization to show concern for the epidemic lack of mathematics enthusiasm. In 1995 the American mathematical Association of Two Year colleges released its report emphasizing the need to establish a "new paradigm," in which the main focus was placed on the teaching of the older student. The guidelines stressed the need to involve these adults in their education through the use of technology, hands on investigations, and cooperative learning strategies.

This establishment of standards for educational institutions echoes the concern put forward by the National Council of Supervisors of Mathematics in a 1977 point paper. This position paper described "the essential mathematical competencies" that will be required by all students for "responsible adulthood" (NCSM, 1994, p. 388). These competencies had twelve components: Problem solving, communicating mathematical ideas, mathematical reasoning, applying mathematics to everyday situations, alertness to the reasonableness of results, estimation, appropriate computational skills, algebraic thinking, measurement, geometry, statistics, and probability (p. 389).

The first eight of these components deal with the less concrete of the concepts, and are the focus of this paper. The last four may be satisfied by curriculum changes which may incorporate these valuable concepts. However, we must not be lulled into the belief that merely *presenting* the material is synonymous with *learning* the material. Offering the last four components

must be done with the vigorous institution of the first eight, for it is this first group that is the foundation of the last four.

As mathematics teachers we should keep the goals of these, and similar organizations, in mind as we present our material. The "how's" of each goal vary and can be as personal as what we wear to class. However, there are some common elements in teaching that emphasize these important guidelines.

#### Use of Modern Technology

There is no question that the use of modern computing tools prepares the student for the mathematics of the work place. The important technological developments of the past couple of decades have enabled engineers and accountants, alike, to apply the mathematics of their respective fields effectively and efficiently. It follows that if our institutions are the breeding grounds for such professions then our students must be not only aware of the applications of this technology within their chosen fields, but also feel comfortable with the applications.

Computers seem ubiquitous. At every turn some form of modern computing machine can be found. Yet computer usage among students, beyond word processing and games, is not as common as some teachers and administrators believe, or would hope. Although this statement is strictly based on empirical data, it merits a close look by all science-based educators.

Administrators and educators understand the importance of using modern technology in the classroom, and often discuss new technological methods to improve learning. They understand that it is incumbent upon each educator in a

mathematical setting to "model the use of appropriate technology" (AMATYC, 13). In the classroom, teachers use computer-generated overlays and large screen monitors to demonstrate mathematical concepts. Although this technological advance in the process of learning has merit, an important element is generally omitted. Since not all students have a computer at their disposal, there is little opportunity to apply the "computer approach" to mathematics to solidify the learning of the day. Even those students who have a computer, usually do not have the software needed to practice the concepts.

Small regional centers and community colleges have the most difficulty in maintaining a bank of computers for students. Even though many have libraries that provide computer resources, these resources are routinely restricted to word processing. In some cases, the Center Director has a separate computer for student use. But even then, the resource can be used only by one student at a time, and only during office hours.

There are four approaches to these problems. First, mathematics classes should be taught in a computer laboratories, when available. This will give each student the opportunity to "play with mathematics" and explore the more complex concepts more freely. This does not mean that small regional colleges must expend large portions of their budget to get reach a goal of "one computer, one student." In fact this single computer approach may "limit students' decision making process," and robs them of experiencing the problem solving processes associated with group work (Heid, 1990). If computer laboratories are not available, then hand held graphing calculators should be available for the students.

Second, as educators we must feel comfortable with the use of computers within our field. This should include our comfort with *when* to use technology and *when not* to use it. The AMATYC encourages students to use the technology as an enhancement to the study of mathematics, not as a replacement classroom instruction. In this vein, the use of technology allows for the exploration of curves, the impact of changing variables, and a myriad other exciting explorations that used to take precious classroom time to demonstrate. The fear by many educators is that too many class hours will be devoted to teaching the software and not the applications. To this end the AMATYC encourages curriculum designers to assess the amount of time spent "learning how to use computers and calculators effectively" to ensure that it is "compatible with the expected gain in learning mathematics" (AMATYC, 1995). Heid recommends devoting "a reasonable amount of time to preparing students for the use of computer software." (Heid, 197). This can be done effectively by using software that engages the student (either through role playing or another interactive game) while at the same time teaching them to perform mathematical manipulations. The earlier this is done in the educational process the less time must be spent later when using a computer is essential.

Additionally, we should take care to not replace the underlying mathematics involved in problem solving with straight application on computers. An important man once said, "Those who know 'how' will always work for those who know 'why'." Students should be able to recognize when data has been entered incorrectly, or software has the dreaded "glitch." Teaching the "why's" of mathematical concepts goes a

long way in determining if the answer received is the answer expected.

Third, the students should be encouraged strongly to purchase a computer or a hand held graphing calculator when they first sign up for courses in mathematics. As stated earlier, involving students in the problem solving and decision making with the use of computers and calculators can enhance their ability to perform more complex problem solving in later courses. Fourth, software and hardware should be made available at discounted rates to help defray the costs of such a large investment. While this may seem an unreasonable concept on the surface, it has merit. College bookstores, like many large stores, can buy in such large quantities that their costs are dramatically lower. While it is understandable that these stores are not "altruistic," they could offer essential items like these at reduced profit margins.

If the old adage, "Practice makes perfect," is true, we owe it to our mathematics students to give them the opportunity to practice as much as possible. Technology can help only if it is available.

### Mathematical Proofs

In mathematics, there is little that is more elegant, and little that is more exciting than to perform a proof. Teachers of mathematics know this and enjoy the ability to "show off their skills" in front of the class. For those curricula that require advanced mathematics, the proofs are an integral part of the lesson. However, many in our profession forget that it is not necessarily in the best interest of students in non-technical curricula to overwhelm them with complex numerical manipulations.

Am I suggesting the teachers never

do proofs? Not at all! However, the teacher must evaluate the level of the class, the necessity of the proof, and whether the proof will contribute more to the understanding of the lesson than to the confusion of the students.

We should be able to divide our students into two distinct groups. The first are those who wish to go on to "bigger and better things" in mathematics. This group usually has a firm foundation in mathematics, is convinced that mathematics is "learnable," and can be enjoyable. Their background is such that proofs encourage them "to explore mathematical topics; develop and refine their own ideas, strategies, and methods; and reflect on and discuss mathematical concepts and procedures (Garofalo, 1989, p. 504)."

The second group, however, are those who have been overwhelmed by the concepts of mathematics. They are the classic "teacher phobes" discussed earlier. Both the NCSM and NCTM standards encourage the type of reasoning described for the first group. This group, however, will take some time, patience, and understanding before they are able to assimilate the mathematical reasoning associated with proofs.

For instance, when I teach an algebra class to students in group two, I always present the Arabic proof of the quadratic equation. As we work through the proof, I pause at each logical juncture and emphasize that the previous step was a procedure that we had covered in a previous lesson. By the end of the proof, the students are often amazed that the proof was so easy to perform, and made up of manipulations that they knew. Their mathematics skills, reasoning, and confidence have been reinforced.

Additionally, with the emergence of new classroom computer technology, there is some argument of classical proofs over exhaustive computer proofs. Although that argument will probably persist for years to come, there is some merit for computer proofs, especially in non-technical mathematics classes. Should a teacher feel that a proof is absolutely necessary, she should evaluate using computers to perform an exhaustive proof rather than the classical theoretical proof that may confuse more than help.

#### Make Mathematics Relevant and Fun

The classic presentation of theoretical mathematics with no immediate application to activities relevant to the student is boring at the best, demoralizing at the worse. The mistake that some mathematics teachers at colleges and universities make is in presenting a relatively complex concept with only a cursory mention of how it is used in nature. "The Fibonacci series that we have discussed can be seen on roses. Now let's move on."

This approach does little to involve the student in the use of mathematics, and does nothing to reenforce the concepts presented during the class. Teachers should be encouraged to derive scenarios that involve the lesson and the students.

My students seem to enjoy being spies. The class is broken up into teams, consisting of a two to four students with varying ability. (It is important to know your students well enough to be able to assign teams that are not entirely made up of strong students.) During the class the teams assemble outside of the classroom and watch as aircraft circle the field on approach. Their task is to use the angular velocity and trigonometric principles to calculate the

approach velocity and height of the aircraft. In other scenarios, they use calculus to estimate the acceleration of rockets, or rate of infection caused by biological contaminants. In more basic classes, we use logs to analyze the current population growth and the decline in food supplies.

Each team is required to present and justify their findings using the mathematics they have learned during the semester. In all cases discussions about the findings are encouraged, and students are challenged by "what if" type questions. It is through this dialog that students begin to use the concepts of the class in developing logical argument. Thinking and analyzing in mathematical terms has begun to take shape.

Once a student in England came to me and said that he could no longer look at all the "things around without seeing the math that is involved." This student was not an "A" mathematics student and had earlier professed to be a "math phobe," yet he had begun to witness the beauty that is mathematics.

#### Use Terminology That is Relevant to the Class

Teach in terms they understand, with examples that are relevant to "them." Once while I was teaching at a federal penal institution in California, I was having difficulty getting my students to remember to convert to "like units of measurement" when solving problems. The example that I used was an area problem with measurements in feet and yards. Routinely, 60% of the students would forget to convert either to feet or yards before performing the calculations. One day in sheer exasperation, I surrendered. At that point one of the brighter students stood up and said, "Look, if you bought two kilos to sell for \$20 a

gram, how much would you make?" Every student had the correct answer before I did.

I had not been able to communicate the concepts to them because I was using examples that had no impact on them. Once the "light went on" for them, I was able to use that tie to their past lives to facilitate concepts in their new ones. Although I would never advocate the use of drug examples in a traditional setting, the point remains that it is incumbent on us, as teachers, to find the common ground.

### Ethno-mathematics

What do Bannecker, Al-Khwarismi, Seki Kawa, and Ada Byron have in common? They are NOT European, white, male mathematicians. Yet each had a profound impact on the world of mathematics. *Ethnomathematics*, coined by Ubdratan D'Ambrosio, "is the study of the concepts, practices and artifacts through which we discover mathematical elements among peoples living outside or on the margins of Western culture" (Struik, 1995, pg 1).

The traditional emphasis on Eurocentric mathematics has had a deleterious effect on mathematics learning in non-European countries, and may have impacted the diverse culture of our schools as well (Struik, 1995). Given the potential of such exclusionary teaching, it stands to reason that including the mathematics of various cultures, side by side with the concepts of European cultures, would empower *everyone*, not just the few.

To this end, I require at least one term paper in each class. Students are challenged to write a paper on the mathematical contributions of a non-traditional mathematician or culture. As an

integral part of the paper, the student must use the concepts learned during the current class to explain those contributions and their meaning to society as a whole.

Developmental mathematics classes have presented papers on the *quipos* of the Inca civilizations. Others have compared the calculus work of Seki Kawa with that of Newton and Leibnitz. In each case, the students' learning and processing of mathematical ideas increased. More importantly they began to realize that each culture has contributed to the body of mathematical knowledge.

At the end of one Business Mathematics class, a student approached me about her paper. She expressed her surprise and delight at having learned the degree that African Americans have been involved in mathematical discoveries. This simple paper had empowered her to search out other scientific contributions by minorities and had inspired her to continue studying mathematics.

For some, this opportunity to write is the empowerment of their cultural heritage, for others it is a challenge to stereotypical misperceptions. In an algebra class, one of my students was surprised that women had been involved in mathematics. He had "always heard" that women "weren't good at math." Although it would be naive to believe that this single experience changed years of prejudice, it, at least, had increased his exposure and broadened his horizons.

### Mathemantics

*Mathemantics* is a term I used to describe the process of writing about mathematical concepts in everyday language, using terms that are clear and easily understood.

As stated earlier, I require at least one paper per semester from each student. This serves two purposes: it helps the student to assimilate the mathematical concepts more completely, and it gives the students feedback on their ability to write technical data clearly and effectively.

I am, if nothing else, a realist. Six months after the end of a semester, I am not sure how much a non-technical student in a required mathematics class will remember. However, there is one thing of which I am certain: If that student has written a paper on a mathematics concept, that concept will be deep seated in her, or his, memory.

During the research the students must review the principles of mathematics that deal with their topic. It is during this review, that I often get office visits asking for clarification of confusing ideas, and in depth questions concerning the applicability of specific concepts. Students generally confront concepts that were more advanced than those taught during the class, and, thus, learn even more than was originally intended. As the student begins to write, the mathematical concepts and their use are reframed into the language best understood by the student. As teachers, we often lose our ability to explain mathematics in terms that all of our students can easily grasp. The reframing of concepts allows the writer to describe the processes in a way that we may not have thought of using. Additionally, it allows us to evaluate how the student has assimilated the course material presented in the paper.

Having read many Graduate Research Projects, it has come to light that our current system is producing students in technical curricula that can perform quality mathematical manipulations, but cannot put the words together well enough to convey

their thoughts. Teaching students to write technical papers at an early stage in the educational experience prepares them for the rigors of the work place. It is there that our students will be put to the true test of their ability, and it is there that the true worth of their degree will be seen.

#### Remember What It Is Like

A professor that I know begins each semester the same way. She introduces herself and explains that she has been doing "this" level mathematics since she was eleven years old. This well meaning and brilliant professor, through this story, begins each class under a shroud of intimidation.

From the students' point of view, it will be difficult to approach her with questions without feeling "stupid" or inadequate. This professor cannot establish an identity power base with her students, because, again from their point of view, she clearly won't know what it is like to be completely lost in a mathematics class.

In some cases, that last view of the student is correct. As teachers, it is important to attempt to "walk a mile in the student's shoes." If you were slow to understand mathematics, try to remember the frustration of being "clueless" during the class, and then try to convey the sheer joy at the enlightenment of mathematics discovery. If you are one of those fortunate mathematicians who have been a "math whiz" since second grade, at least try to understand the students' misery by thinking of something that you had difficulty learning. It is never appropriate to tell untruths to a class, but one must filter one's discussions to exclude possible stumbling blocks.

Oddly enough, I truly enjoy telling my students that the only class I ever failed

in high school was a mathematics class! They are usually astounded that "he's been there," and know that I can appreciate their struggle. Even more importantly, they can see that mathematics can be conquered, even by those of us who were slow learners.

#### If At First You Don't Succeed ...

If one approach doesn't work, try another. One of the most frustrating classes I have ever taken was a graduate seminar in stochastic modeling conducted by a doctoral teaching assistant (TA). Most of the students in the class were struggling with the concepts, and on one particular day the TA had presented the same problem at least a half a dozen times, in the same way. Finally one brave soul exclaimed, "I'm sorry, I don't understand how that was done. Could you explain it a different way?" The now frustrated TA yelled, "I only know one way. You'll just have to live with it!" From that point on most of us got little from the seminar.

Unlike most of our students, we go in to each session prepared with examples and solutions. In our preparation time it is in our best interest, and certainly the best interest of the student, to prepare a separate approach to the more complex areas. This serves a two-fold purpose. First, it actually gives the student a different perspective of the problem. Second, it helps to maintain our credibility in the class.

Be careful, however! It is not always in the best interest of the class to present different ways if all but one student understood the first way. In fact, it may do more to confuse than to help. Usually a quick "I'll be glad to show you a different way later," helps.

#### Be Careful of What You Say

Many of our adult learners, especially those in the developmental mathematics classes, may have suffered greatly from a teacher who told them that they were just not smart enough to do the mathematics. For instance, I know a young 4th grade student who is already convinced that she cannot do mathematics. This first step toward mathematics anxiety is based simply on a series of quick timed tests. The teacher told her that she certainly wasn't going to be an engineer, but social work would be okay!

The Pygmalion Effect, or Rosenthal Syndrome, is a psychological concept that emphasizes that the way we think about people impacts their behaviors. If we, as teachers, think of particular students as "mathematically challenged," then we will begin treating them as though they are slower than the others. These exhibited behaviors on our behalf triggers self-doubt on the behalf of the student. This apprehension to perform mathematical manipulations simply re-enforces our original belief, resulting in the proverbial "See, I told you that student couldn't do math!"

We **must** counter such actions as often as we can. Perhaps the best way is through positive re-enforcement, when appropriate. Give the struggling student an easy problem to answer. When they get it right, praise them appropriately, and issue a problem with more of a challenge. Eventually, the student will begin to realize that they can do mathematics, and will start a positive spiral in the Pygmalion cycle.

#### Create the Environment For Learning

Intimidation and fear must be replaced with cooperation and understanding. If each time a student ventures a guess, he is

belittled, made to feel inadequate, or embarrassed, he will stop volunteering information. Eventually, he may stop listening and learning. Students need to explore the wonder of mathematics in a non-threatening environment. One in which a wrong answer is not held up to ridicule.

This does not mean that we are responsible for "coddling" our students. However, we are responsible for ensuring that their psychological safety is not threatened each time their hand is raised to answer.

### Be Enthusiastic

Most of my students think I'm crazy! And that's wonderful! I make every attempt to infect them with the excitement of mathematics. There is no other subject, in my eyes, that can be as beautiful, yet as functional as mathematics.

Rarely do I lecture at a podium from the front of the room. Usually I am wandering about the room discussing a problem that I placed on the board. This "out and about" approach to teaching allows me to see the problem from the students' perspective and tends to get the students involved in discussion rather than simply yelling out answers. Of course the added benefit is that it serves as a reminder that if you fall asleep in my class, I will probably start talking rather loudly right next to your desk!

How wonderful it is to hear students say they were in class because they didn't want to miss what I was doing that day. Sometimes it is the math discussions about the tuition rate hikes, election year statistics, or maybe it is just my bizarre collection of outlandish "Friday" neckties. Whatever the cause of this excitement, it is happening in a mathematics class!

### Summary

Remember that many adult learners of mathematics are teacher phobes, who have a significant hurdle to surmount. It is our job to help them do it. The student is not here for us, rather we are here for the student. We must do our level best to present material that conveys the concepts of mathematics in a language that is easy for them to grasp, represents all cultures, and continually engages them. Empower your students with the knowledge that mathematics is not above them, rather it is there for their taking.

One day towards the end of a developmental mathematics class, an adult learner approached me to thank me. She said her daughter was having trouble with mathematics at her school. For the first time in her daughter's life, my student did not have to say "Go see your Dad." They sat down together and worked through the problems. They were both proud of her new ability. I was proud, too.

Empower your students with mathematics that is inclusionary. Teach them; don't just throw facts and formulae at them. If you do, one day all our adult students will be proud to say that "math is easy."

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