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Teaching: more than just lecturing

C. Roettger
University of Toledo, USA

L. O. Roettger
University of Toledo, USA

F. Walugembe
Makerere University, Uganda

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Journal of University Teaching and Learning Practice

Teaching: More than Just Lecturing

Caroline J. Roettger

The University of Toledo

caroline.roettger@utoledo.edu

Lloyd O. Roettger

The University of Toledo

Frederick Walugembe

Makerere University

Abstract

This study focused on effective teaching strategies for university professors. The researchers studied the relationship between teaching effectiveness and the dynamics of student demographics. An examination of the changes in the composition of the college population over the last few decades, based on statistical data, as well as an overview of theories of teaching and learning published in professional books and journals in both K-12 and Higher Education, provided the framework for an assessment of the effectiveness of various approaches to teaching. The final recommendations are based on the conclusions resulting from a comprehensive analysis of various research studies.

Tell me and I forget,
Show me and I remember
Involve me and I understand. Chinese Proverb

A room full of college students chat leisurely while waiting for their professor to enter and teach. They check their watches and discuss how long they must wait for a full professor. 'Fifteen minutes' one young man says with assurance, another states that the professor always arrives about 12 or 13 minutes late but that he hopes he'll show up sooner so he can get to sleep sooner. Everyone laughs and a moment later the professor arrives and approaches the lectern. The professor pulls out a handful of yellow legal pad pages with hand scrawled notes and begins to lecture in a strong even monotone voice. The students settle back in their seats, some taking notes, others staring off in space. About 40 minutes later the professor stuffs his notes back into his briefcase and leaves.

Demographic Comparison of 1900 Student to 2000 Student

At the beginning of the 20th century in the United States less than 30,000 people earned bachelor's degrees (National Center for Educational Statistics). At that time the majority of college graduates were white upper middle class and upper class males (Forest & Kinser, 2002). It was difficult for women and minorities to enrol in universities during this time (Forest & Kinser). In some instances women were allowed to attend lectures but were not allowed to enrol in degree programs. One 100 years ago higher education in the United States was almost exclusively a rich white boys club. The teaching modality of choice at the beginning of the 20th century was male professors lecturing to male dominated classrooms.

Currently, student enrolment of universities in the United States is very different. The enrolment total is over 17,472,000 (US Census Bureau, 2005). The number of female students exceeds the number of male students. Women make up 56 percent of all undergraduate college students and 59% of all graduate students (US Census Bureau, 2005). Racial diversity has become a more of a reality. According to the Institute for Educational Sciences, "Minority students accounted for 34 percent of the increase in the number of master's degrees, 73 percent of the increase in the number of first-professional degrees, and 28 percent of the increase in the number of doctoral degrees earned" (NCES, 2007, para. 3).

Although 72.9% percent of 4-year college degrees conferred during the 2004-2005 academic year were to White students, there has been an increase in the percentage of minority students receiving degrees and a decrease of the percentage of White students receiving degrees during the past 10 years in both 2-year and 4-year institutions. See Figure 1 and 2. (Condition of Education), The percentage of minority students receiving 2-year associates degrees has also increased during the same 10-year period and a decrease is shown in White student graduation.

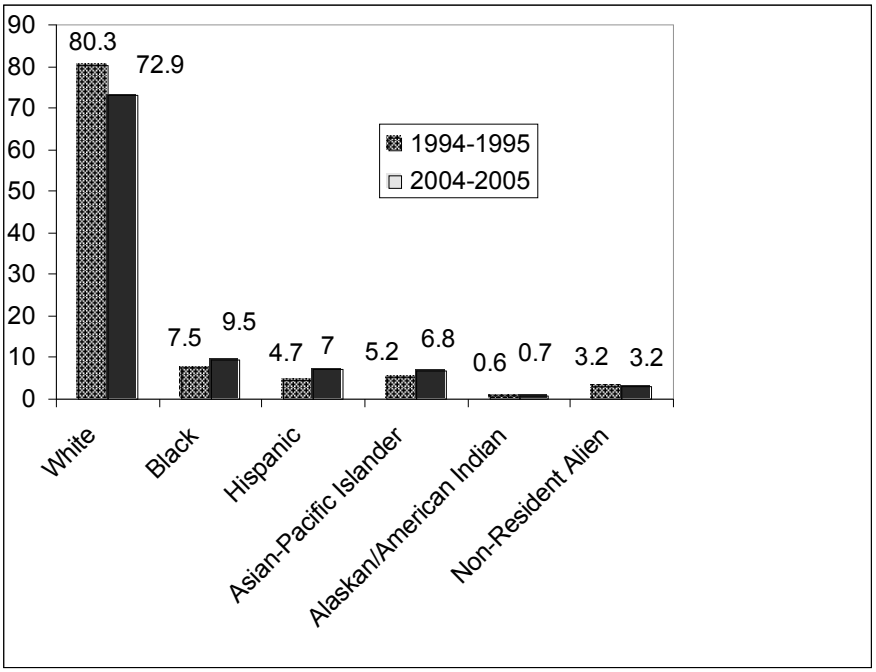

Figure 1: Percentage of Race for 4-year University Students 2004-2005.

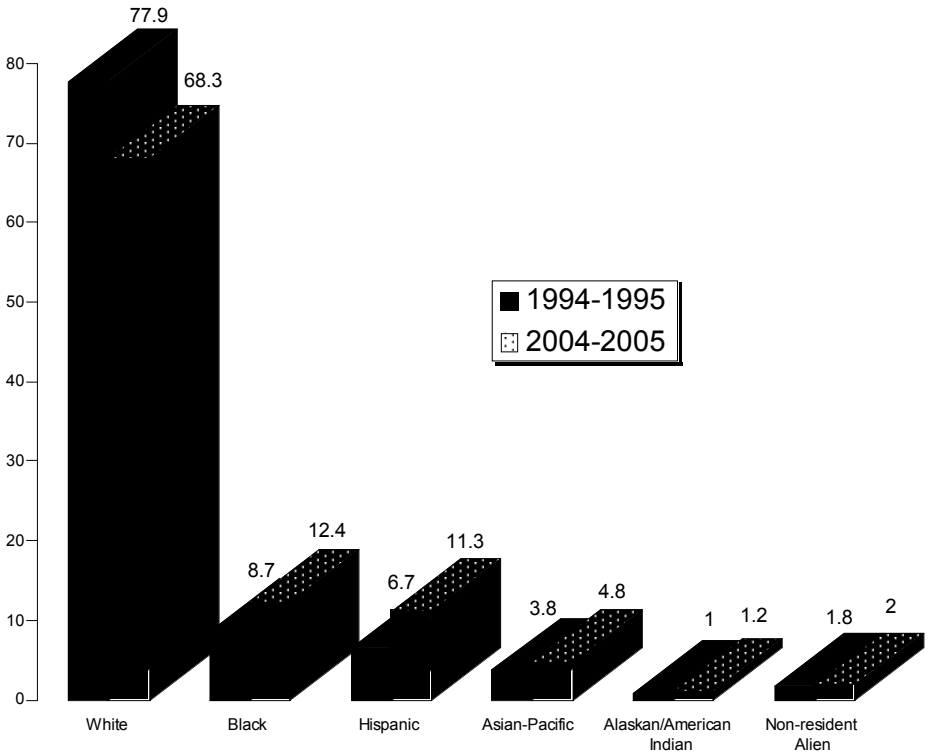

Figure 2: Percentage of Race for 2-year Associate Degrees 2004-2005

Another change in student demographics is the number of students with disabilities that attend the university. Today nearly 10% of university students have some kind of disability; the majority of these students fall under the category of Learning Disabled (Hebel, 2001; Vogel, Leyser, Wyland & Bruelle, 1999).

While the college student body of the twenty-first century is more diverse than at any other time, the preparation for college professors has remained very similar to that of a professor at the turn of the twentieth century. Most professors are not required to take a course in pedagogy or any other education course as part of their preparation. Few universities require professional development focused on the teaching experience. As Royse (2001) states in Teaching Tips for College and University Instructors: A Practical Guide.

The graduate education we acquired in our specialized fields didn't prepare most of us for all of the situations and problems that can arise during an academic term. Once in the classroom, it is not unusual for new instructors (and sometimes very experienced ones, too) to wish that they knew quite a bit more about teaching (p. xiii).

Despite the changing demographics, the teaching modality of choice at the beginning of the 21st century for many Higher Education classrooms is professors lecturing to classrooms of greater diversity. Today, more than any time in U. S. Higher Education history, teacher preparation is needed for university professors. The diversity of the classroom, the variation of learning styles and the wide range of abilities students possess represent challenges that need educated, researched solutions.

Student Attrition

Nearly 66% of high school graduates in 2006 enroled in colleges or universities in the fall of 2006. However, a problem for higher education is the attrition of the student population. Graduation data was collected and analyzed for the period between October 1998 and August 2004 with a focus on first-time, full-time degree/certificate-seeking undergraduates who were enroled in Higher Education. (This data is shown in Figure 3.) While 4-year colleges ranked substantial higher than 2-year colleges 45% of students had not graduated during this 6 year period. Another study by Venezia, Callan, Finney, Kirst & Usdan, (2005) found:

> *Of every 100 white, non-Latino students, 93 graduate from high school, 62 complete some college, and 29 obtain a bachelor's degree. For African-American students, the numbers are lower: 86 graduate from high school, 48 complete some college, and 15 obtain a bachelor's degree. For Latino students, the numbers are lower still: 61 graduate from high school, 31 complete some college, and 10 obtain a bachelor's degree (p. 8).*

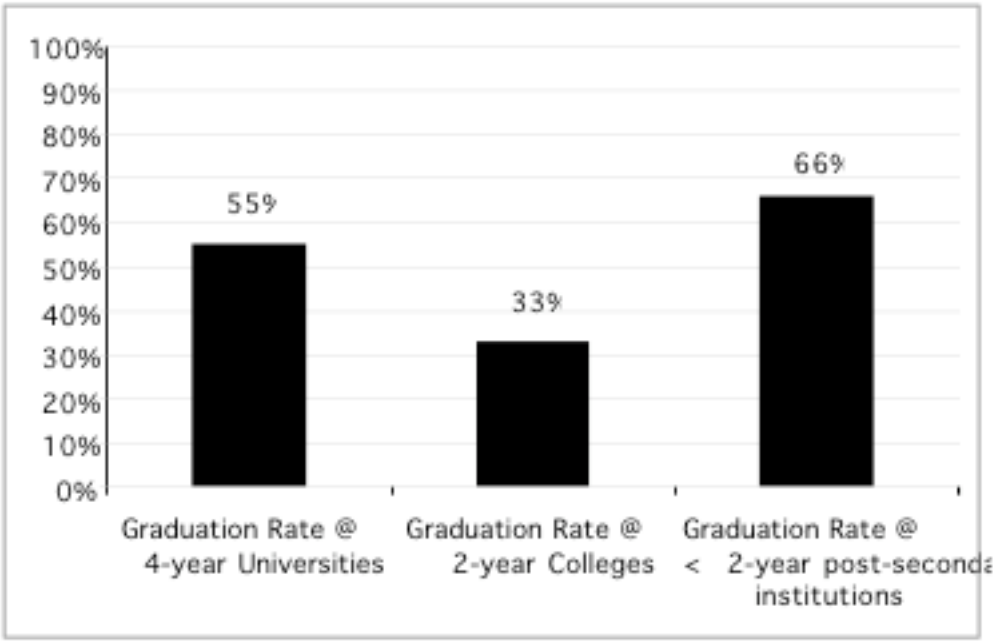

Figure 3: Graduation rates at 4 year, 2 year and less than 2 year colleges for first time freshman; 1998.

Factors Affecting College Dropout

There are several factors that affect this high college drop-out rate. One is the number of students who attend full time versus part time. During the 2003-2004 academic year four-year college students attended as full time students 63% of the time; Community College students attended full time 31% of the time (Horn & Griffith, 2006). Still another factor is students who work while attending college. There are three major categories of student enrolment pertaining to work; employees who attend school, students who work and students who do not work. The four year college student breakdown of work experience in 2004 was 54% students who work, 16% employees who attend school, and 30% students who do not work (Horn & Griffith). The community college student breakdown of work experience in 2004 was 44% students who work, 35% employees who attend school and 21% students who do not work (Horn & Griffith).

Another problem is a disconnect that often exists between Higher Education and K-12 education. While there has been a push for K-16 education, it is still far from reality in many areas of the country. Kirst (as cited in Venezia, et al., 2005) states:

> *A profound organizational, political, and cultural chasm persists in most states between the governance systems of K–12 and higher education. The two sectors continue to operate in separate orbits and to live apart in separate professional worlds, associations, and networks... (p. 2).*

A further problem is many university professors still view the student population as the elite few, when in fact this is no longer the case for many students (Venezia, et al.). Conflicting ideas of the nature of Higher Education are sent to parents, students and K-12 educators who work to prepare students for college (Venezia, et al.). This disconnect exacerbates the other problems for entering freshmen who often find the work too hard and the freedom to play too enticing. Students who have had great success in high school are also disillusioned when the first semester of college sends a clear message they are not ready.

University Leadership and Teaching

One major problem for university professors, especially at Tier One or Tier Two research institutions is the “cultural devaluation of teaching” (Rabow, 2006, pg 17). Many universities posit that students and teaching are important. However, the true reality is revealed through the reward of promotion and tenure which too often are tied exclusively to research with little to no value placed on instruction (Boyer, 1990). This ‘culture’ has remained constant for over a century.

Shulman (1999), in Taking Teaching Seriously, explains that there should be a new scholarship of teaching that is transparent, public, critically evaluated and respected. Serious study of learning and the scholarship of teaching are encouraged in the Carnegie Academy for the Scholarship of Teaching and Learning (CASTL) (Shulman, 1999). This organization, through the CASTL Institutional Leadership Program and CASTL Affiliates Program, has been working to elevate teaching and learning since 1998. A serious elevating of teaching and learning as important work for professors is necessary and despite the efforts of CASTL, is still not a practice valued by most universities.

"Faculty tend to teach as they themselves were taught" (Royse, 2001, p. 5). This fact drives the need to examine more closely the teaching experience, the student, and what kind of approaches and strategies could increase the effectiveness of teaching and the quality of learning. Special attention to both the effectiveness and the efficiency of university instruction, or in other words, the quality of learning and teaching is necessary.

University Leadership and Teaching

If improvement in Higher Education instruction is to occur it must be directed by leadership, either at the level of chair or dean (Ramsden, Prosser, Trigwell, Martin, 2007). Knight and Trowler, as cited in Ramsden et al., also posit a greater connection between K-12 instruction and Higher Education instruction since "specific differences between schools and HEIs are less significant… than their shared purposes and types of work" (p. 142).

Martin, Prosser, Trigwell, Ramsden and Benjamin's (2000) research of what university teachers teach and how they teach it revealed a fundamental idea "that the way teachers approach their teaching and the strategies they deploy is directly related to what it is teachers want their students to know, 'the object of study'" (p. 411). This led to the final question that should drive instruction "what is it that teachers want their students to learn and how do they believe their students will come to know this – 'the object of study'" (p. 411).

This is not a new idea for K-12 teachers. The mantra for lesson planning for K-12 educators for decades has been what should the students know and be able to do after the teaching has occurred. Madeline Hunter wrote Mastery Teaching: Increasing Instructional Effectiveness in Elementary and Secondary Schools, Colleges, and Universities in 1994 and had addressed these issues in previous books. With this in mind, the following discussion of theories of learning and instruction for Higher Education includes information from K-12 and Higher Education research on learning.

Information about Learning and the Brain

A brief understanding of the activities that best support learning is necessary for this discussion. According to Sousa (2006), a study conducted by the National Laborites of Bethel Maine in the 1960's determined what we retain after 24 hours of a teaching episode. The findings:

- 5% of lecture
- 10% of what we read
- 20% of what we hear
- 30% of what we see
- 50% of what we both see and hear
- 70% of what we discuss with others
- 80% of what we experience personally
- 95% of what we teach to someone else (p. 95)

Newer research by Moore (2005), also cited in Sousa (2006), shows 10% retention after 3 days from materials presented through lecture. This is powerful information. It is easy to infer that professors who teach primarily through lectures and reading assignments provide only minimal opportunities for learning when considering these statements. Sousa points out that no one type of teaching is best, but it is important to incorporate a variety of approaches in lessons for optimal learning.

It is important for the university professor to be acquainted with basic information about the human brain and to understand the processes involved in learning in order to better facilitate the learning experience for all students. Although within the field of cognitive psychology there are various theories and models concerning the way in which learning occurs, a person who teaches because he or she has content expertise may not be acquainted with these theories. A few key aspects by cognitive psychologists and K-12 researchers that have been identified for this discussion include:

- Learning occurs through social interaction. Taking time to build an emotional climate is critical to learning since the brain cannot focus attention if it is scanning for potential harm (Sousa, 1998).
- How a person feels about a learning situation determines the amount of attention devoted to it (Goleman, 1995).
- The brain can only consciously focus on one thing at a time. (Jensen, 1996).
- The brain is always seeking patterns. Anything that breaks the pattern is novel and evokes attention (Jensen, 1996).
- Active learning should provide opportunities for the brain to connect new experiences with past ones. Does this make sense? Does this have meaning? When meaning and sense are present, the likelihood of long-term storage is high. (Sousa, 2001).
- Modeling is a powerful way of promoting meaning. (Stocking, Bender, Cookman, Peterson, & Votaw, 1998).
- The brain remembers best what comes first, and next best that which comes last (Sousa, 2006).
- We remember what we understand; we understand only what we pay attention to; we pay attention to what we want (Boles, 1988).

- "Learning is basically an interplay of two challenging processes--getting knowledge that is inside to move out, and getting knowledge that is outside to move in" (Shulman, 1999, p13).
- It is important to value the knowledge the student brings with them or what they already know. All learning is built upon previous knowledge. (Ausubel, as cited in Shulman, 1999).

Bloom's Taxonomy

A basic understanding of Bloom's (1956) taxonomy is essential for K-12 instructors. It seems an excellent basis for university instructions as well. Bloom outlined six basic types of understanding for learners: Knowledge, which is recall of information; Comprehension, which is an understanding or translations of the idea; Application, which is a use of the information in a new context or an unprompted use of an abstract; Analysis, separating the information into components or parts so that it can be organized for understanding; Synthesis, creating new meanings from parts of knowledge; and Evaluation, making a judgment about the information. (Bloom). Bloom's Taxonomy has caused multiple studies and much information can be found that inform vocabulary that expresses each category, ways to question to draw out each category and activity suggestions that focus on each category of learning.

Fink (2003) has expanded Bloom's Taxonomy for Higher Education. She states that: Foundation Knowledge, deals with knowing basic knowledge for the subject; Application, the ability to use the knowledge in a new way; Integration, the ability to make and understand connections between different things; Human Dimension, the personal and social implications of what they have learned (p. 31); Caring, a change in the degree to which students care about something (p. 32); and Learning How to Learn, understanding the process of learning itself (p. 32). Fink's taxonomy builds upon Bloom's three specific taxonomies: Cognitive, Affective and Psycho-motor. It is a good resource for faculty of colleges and universities that want to greatly improve teaching.

Constructivist Learning Environment Model (CLE)

One effective instructional model known as the *constructivist learning environment* model (CLE), designed by Jonassen (2002), is based both on the socio-cultural theory of learning, initially developed by Vygotsky (1993), and the information processing model. The CLE is an instructional model that seeks to develop a learning environment where efficient learning occurs due to the fact that the learner is actively engaged in, and takes ownership of the learning process and the learning goals. Learning in this model is often informed by examining ill designed or ill structured problems. These problems can be represented in a

case study or project. The learning in this instance is active, not passive. The use of this model could lead to engaged actively learning students in university classrooms.

This model emphasizes the importance of social, inter-personal transactions of meaning and of cooperation in the construction of knowledge. It also describes the use of various cognitive tools in the process of knowledge construction. Professors could aid knowledge building through social interactions, and mental processes they facilitate in their classrooms by the use of cognitive (mental) tools (Vygotsky, 1993).

Professors who use the CLE model place the focus of the learning environment on a problem, question, or project that has to be cooperatively solved, answered, or developed instead of using the traditional lecture methods. Allowing the learning to become active requires that the problem drives the learning. In order to actually drive and stimulate learning, the topic must be viewed by students as important, interesting, relevant to the real world, and engaging so that the learner can take ownership of the problem. The problem should also be, to a certain extent, ill-structured, leading to multiple interpretations and multiple possible solutions - as most real-life problems are. The problem has to be authentic and worth making an effort to solve. Professors who are able to transfer problem ownership to their students are more effective that those who stand and deliver a lecture. Professors who use this teaching and learning strategy must be willing to be a facilitator of learning rather than a dispenser of knowledge,

According to the socio-cultural theory of learning, mental processes are actions that cannot be separated from the environment where they are performed. In other words, they need to be situated within the limits of the world with which the learner is more or less familiar, and where the learner can figure himself or herself affecting, and being affected by the environment (Vygotsky, 1993). Jonassen also states that, in order to assume ownership of the problem, students need to “know that they can affect the problem situation in some meaningful way” (p.222). They need to be able to act upon the given conditions, to manipulate them directly or with the aid of physical or cognitive tools. They have to be able to “test the effects of their manipulations” (p.223), interpret the feedback, and if necessary, adjust their problem solving strategies.

Ill-structured problems require learners to develop coherent arguments to support their answers and their problem solving process then verbalize their solutions to problems. The majority of decisions are made and problems are solved in collaboration with others. This emphasizes the importance of verbal tools in the construction of knowledge and cognitive skills, which are a keystone element of this approach to learning. A natural extension of this approach would be for the learners to reflect on their actions that created the solutions and their learning.

If the student's role in learning is to actively - and also cooperatively - try to solve an ill-structured problem, the role of the professor is to guide, facilitate, and coach this action. The professor provides access to related experiences in order to compensate the lack of experience, which is inherent in novices. In addition, the teacher can scaffold the students' reasoning by asking questions about similar situations encountered in related cases. Jonassen , as cited in Reigeluth (2002) shows that the theorists of case-based reasoning believe that "human knowledge is encoded as stories about experiences and events" (p. 224).

The professor also needs to identify the type of information required for the understanding of each particular situation, and provide the students' access to that information. When the lessons are structured correctly, most students take an active role in their own learning. By provoking and facilitating discussions revealing different perspectives, interpretations, or alternative solutions the professor can enhance the students' cognitive flexibility, helping them move towards a higher level of cognitive development.

Structure of the Teaching Experience

The structure of the teaching experience is also important. The essential concept intrinsic in any lesson structure is that a clear aim is designed for the lesson structure, students are actively drawn into the teaching experience, the teacher presents basic information and models how it is to be used in some way, students understanding is checked, the lesson is closed and the student has an opportunity to use the new knowledge independently (Hunter, 1994).

The length of time the average adult student can concentrate during a lecture is 15 to 25 minutes. After that time there is a need for a break of some kind (Jensen, 1996). It can be a brief break of 2 or 3 minutes, but the students will become restless, inattentive and frustrated if the lecture lasts must longer without a break.

Considering these facts the professor can begin to shape the classroom-learning environment to meet the need of the students. "Who I teach should shape how I teach because who the students are shapes how they learn. (Tomlinson, C. A., 2001). The diverse needs of the students should drive the learning experience. It is the professor's duty to meet these needs. It is the professor's responsibility to move beyond the basic lecture and create a class culture of shared learning.

What should be present in good courses? According to Fink (2003):

Good courses are courses that…

- Challenge students to significant kinds of learning
- Use active forms of learning
- Have teachers who care—about the subject, their students, and about teaching and learning
- Have teachers who interact well with students.
- Have a good system of feedback, assessment and grading. (p. 28)

Fink states if any of these factors are missing the course will be poor no matter what else is good about it. She also states the reverse; if all factors are present the course will be good no matter rather the instructor has weaknesses in other areas.

Recommendations for Action

A reconsideration of the diverse demographic makeup of today's college student is one reason why professors need to understand learning and instruction. These students bring multiple ways of learning, a variety of cultures, and a wide range of background knowledge. The job of meeting the needs of so many different students is complex and professors need training to best handle to the challenge.

It is also important to carefully judge the amount of material to be covered during the semester. Students will be more likely to achieve at high levels if expectations are set high. However, when considering materials to cover, more is not always best. If a student can learn the important content concepts by reading 200 pages and writing 3 papers, there is no need to assign 800 pages and 5 papers. The aim is to develop a deep understand the concepts, not survive an endurance contest.

Students should receive regular feedback through assessment and evaluation. This is the opportunity for students to gain understanding of their strengths and weaknesses. It is also an opportunity for the professor to determine weaknesses in the course design and make mid course adjustments. An assessment at the beginning of the class can help the professor determine the students' prior knowledge of the materials to be taught and restructure lessons that contain information the students already know. Evaluation is the key to continuously improving instruction and should be timely and provide clear feedback. These basic course structures lead back to the learning and teaching episode itself.

Finally, the size of classes should be easy to manage. The practice of large entry level classes during the time the student is most venerable to failure as shown through freshman attrition statistics is not a wise practice. If universities accept a student, it should be with the aim to help the student succeed and reach the goal of graduation.

Jungic, Kent and Menz (2006) ask how the professor can meet the following challenges in classes of 350 students: "maintain a level of human interaction with students… schedule effective office hours, dealing with email, assigning homework and recording grades on a large scale" (p. 1) Jungic et al. continue to provide guidelines for how to best meet the needs of the students in these classes, but this practice is not student centered, it is university centered.

In order for college professors to be better prepared to meet their student's needs, all universities should provide professional training. Instruction for entry-level professors could be a logical starting point for required training. Faculty meetings that devote some time to teacher talk and provide examples of how to lead the learning process effectively could also be helpful. When professors are encouraged to share best teaching practices the teaching episode has the possibility of gaining in importance. As teaching improves, student retention should increase.

The responsibility for providing the training lies with the university. Professors should be provided the training so that they will feel better equipped to meet the needs of their students. Students deserve professors prepared to meet their needs.

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