APPLYING ANGELO'S TEACHER'S DOZEN TO UNDERGRADUATE INTRODUCTORY ECONOMICS CLASSES: A CALL FOR GREATER INTERACTIVE LEARNING

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In his article "Teaching Economics in the 21st Century", William Becker [2000] once again states that the field of economics has placed too little value on the importance of teaching in recent decades [Becker, 1997; 2000]. To improve teaching and learning, Becker suggests that we should ask the question, "What changes in the way we teach economics in our colleges and universities will enhance the use and appreciation of economic analysis?" [2000, 109]. One potential approach to addressing Becker's issue of improving "what we teach, how we teach, and the assessment of the educational outcomes at the baccalaureate level" is to examine the applicability of Thomas Anthony Angelo's "Teacher's Dozen" [1993] to the undergraduate introductory economics course.

PURPOSE AND SCOPE

The basic purpose of this paper is to examine Angelo's "teacher's dozen" to see which of the fourteen principles improve and enhance teaching and learning in the introductory principles of economics class. First, characteristics associated with the typical undergraduate introductory economics class will be discussed. Given these characteristics, the paper will then discuss six main themes around which the fourteen principles appear to cluster. The paper ends with recommendations for certain activities, in and out of the classroom, drawn from Angelo's work, which could potentially improve "what we teach, how we teach, and the assessment of the educational outcomes" in the introductory economics class.

THE UNDERGRADUATE INTRODUCTORY ECONOMICS CLASS

Although a variety of alternative methods can be used to teach undergraduate introductory economics, economics professors prefer the lecture and chalkboard [Becker, 1997, 1361]. Despite differences in institutions, class sizes, and teaching loads, surveys [Becker, 1997; Benzing and Christ, 1997] tell us that the dominant teaching style for undergraduate introductory economics classes is lecturing and us-

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ing the chalkboard to write text, equations, and graphs, while assigning reading from a standard textbook.[1] In particular, cooperative learning techniques in which students work together in the classroom are noticeably absent in economics classes, particularly at research universities where large classes are common [Becker, 1997, 1354]. Becker further suggests that the absence of cooperative learning in the classroom is due in part to the idea that professors believe that cooperative learning techniques require large blocks of time and that not all students tend to get engaged in group activities [ibid., 1361].[2]

The dominant style of testing in undergraduate introductory classes is the multiple-choice exam [Becker and Watts, 1996, 451]. Walstad and Becker suggest that multiple-choice exams tend to be popular because they allow for a wider sampling of the content because more questions can be given in a testing period and because they offer a greater efficiency and reliability in scoring compared to an essay exam [1994, 193].

ANGELO'S TEACHER'S DOZEN

In an excellent article Angelo [1993] maintains that to effectively and efficiently promote higher learning,[3] faculty need to know something about how students learn. Angelo suggests that even though our knowledge of teaching and learning is incomplete and much remains to be discovered, we do know a great deal about how students learn. Equally important, Angelo suggests that there really are some "general, research-based principles" that faculty can apply in the classroom to improve teaching and learning in the classroom [ibid., 3-4].[4]

Angelo's Teacher's Dozen

1. Active learning is more effective than passive learning.
2. Learning requires focused attention, and awareness of the importance of what is to be learned.
3. Learning is more effective and efficient when learners have explicit, reasonable, positive goals, and when their goals fit well with the teacher's goals.
4. To be remembered, new information must be meaningfully connected to prior knowledge and it must be remembered to be learned.
5. Unlearning what is already learned is often more difficult than learning new information.
6. Information organized in personally meaningful ways is more likely to be retained, learned, and used.
7. Learners need feedback on their learning, early and often, to learn well; to become independent, they need to learn how to give themselves feedback.
8. The ways in which learners are assessed and evaluated powerfully affect the ways they study and learn.
9. Mastering a skill or body of knowledge takes great amounts of time and effort.
10. Learning to transfer, to apply previous knowledge and skills to new contexts, requires a great deal of practice.
11. High expectations encourage high achievement.

12. To be more effective, teachers need to balance levels of intellectual challenge and instructional support.
13. Motivation to learn is alterable; it can be positively or negatively affected by the task, the environment, the teacher, and the learner.
14. Interaction between teachers and learners is one of the most powerful factors in promoting learning; interaction among learners is another. [Angelo, 1993]

APPLYING ANGELO'S DOZEN TO INTRODUCTORY ECONOMICS

Although the majority of Angelo's principles call for and speak to the importance of interactive cooperative learning in the classroom, the fourteen principles appear to cluster around six main themes. Those themes are (1) interactive cooperative learning; (2) testing and assessment; (3) motivating the student; (4) setting high goals and expectations; (5) instructional support; and (6) focusing the student's attention.

The Importance of Interactive Cooperative Learning

Angelo's first principle that active learning is more effective than passive learning and his fourteenth principle that emphasizes the importance of interaction between teachers and learners, speak directly to the importance of interaction in the classroom. Angelo says that students do learn more and learn better by becoming actively involved. As with any activity, Angelo maintains it is not the interaction, in and of itself, but the structured interaction, that focuses on achieving a meaningful, shared learning task that leads to effective learning. To Angelo, active learning occurs when students invest physical and mental energies in activities that help them make what they are learning meaningful. [ibid., 5]

Angelo's Recommendations for Application. Angelo suggests that one way to apply the first principle and help students to learn more effectively is to have students explain what they just learned to someone else. According to Angelo, this technique allows students to rehearse the material and receive important feedback. In addition, students should be required to "paraphrase" important concepts to one group and then to paraphrase the same information to a second group. These groups can be parents, co-students, and study groups. To have students cooperate with other students, classroom assignments and activities should be used that encourage and require students and teachers to work together to solve meaningful problems. In addition, Angelo believes the instructor must provide guidelines for the group work and must de-emphasize competition among individuals for grades and approval. [Angelo, 1993, 5, 7]

Other Recommendations for Application. For Becker and Watts [1995, 699], great orators should lecture while the rest of us should consider using a variety of teaching methods to actively engage our students and reduce lecture time. As alternatives to the passive learning approach in undergraduate introductory economics, Becker and Watts recommend a number of classroom concepts and techniques. These activities include games and simulations, experimental economics and classroom ac-

tivities, writing assignments, economics in literature and drama, Nobel lectures, the popular and business press, case studies, and such cooperative learning techniques like "Think, Pair, Share" [ibid., 692-99].

In their article concerning the use of a principal-agent experiment in the classroom, Ortmann and Colander [1997, 449] believe that the advantage of using hands-on classroom experiments is that the experiment goes beyond the actual lessons of the experiment and allows students to actually experience economics. In addition, the authors maintain that classroom experiments can demonstrate "subtleties" that would otherwise be missed.[5] The authors emphasize, it is important to note, that the use of classroom experiments does not have to imply a lowering of standards of rigor [ibid.].

Quddus and Bussing-Burks [1997, 54-61] contend that learning in the classroom is a "jointly produced good" and instructors should encourage students to form study groups because study groups require student interaction. Becker [1997, 1359-61] not only suggests that students should be required or encouraged to form small study groups but suggests that freshman should be in small classes that necessitate in-class interaction. For Becker, however, the critical point for either the large or small class is student participation [ibid., 1370].

It has been suggested, however, that instructors cannot depend solely on cooperative learning to improve teaching and learning in the classroom. Becker and Watts [1995, 698-99] relate that some students and instructors are natural-born listeners and lecturers, some are talkers and discussion leaders, and some seem to learn or teach best using group activities that feature "hands-on" demonstration of economic concepts and relations. For Seigfried and Fels [1979, 953], the best teaching strategy is the one that provides alternative learning methods directed toward the different needs of different students.

The Importance of Testing and Assessment

With his seventh principle, Angelo states that regular feedback helps learners efficiently direct their attention and energies, helps them avoid major errors and dead ends, and keeps students from learning things they will have to unlearn later. In addition, Angelo sees regular feedback also serving as a motivating form of interaction between teachers and learners, and among learners. In reference to his eighth principle, "The ways in which learners are assessed and evaluated powerfully affect the ways they study and learn," Angelo says that for generations, students have asked teachers "Will this be on the final?" Angelo believes students have always asked this question because they simply want good grades and they want to know how to focus their attention. Even if professors don't "teach to the test," Angelo contends that most students will "study to the test" to make good grades. [1993, 6]

Angelo's Recommendations for Application. To apply the seventh principle concerning the importance of feedback, Angelo tells instructors not to assume students understand but to find out exactly what they do know and what they don't know. One suggested technique is for instructors to ask students at the end of class to

identify the "muddiest point." The instructor can then respond to that "muddy point" at the beginning of the next class. In addition, workbooks, study guides, and problem sets can also be used to give appropriate feedback to students and the instructor in undergraduate introductory economics classes. [ibid., 1993, 6]

To apply the eighth principle that says students are powerfully affected by the ways they are tested and evaluated, Angelo maintains that instructors need to make sure their exam questions are about what they want the students to learn. One suggested way to improve learning is to make sure the test questions require the kind of thinking and learning that instructors want, and to make sure students know what those questions will be like. To give students opportunities to practice answering similar exam questions on a regular basis, students can be given either sample exams or a list of study questions from which the exam questions will be selected. [ibid., 6]

Other Recommendations for Application. Although multiple-choice tests are a "staple of assessment in economic classes", Becker [2000, 117] maintains they are "crude instruments" for assessing student learning and should not be the sole method of assessment in any course. No matter how they are delivered, Becker suggests that multiple-choice questions do not involve students in what economists do. To get students to think like economists, Becker believes we need to find ways to move beyond highly structured tests that do not challenge students beyond a recall cognitive level.[6]

Salemi, Saunders, and Walstad [1996, 461] also advocate the use of writing exercises in principles classes to give feedback to both instructors and students. Lippman [1999, 61-62] states that it is important for students to know what types of questions and exams to expect and believes instructors should provide examples of the test questions in advance. Lippman goes on to suggest that only those items discussed in the class should appear on exams and instructors should always go over the exam when returned to the class.

The Importance of Motivating the Student

Angelo's thirteenth principle, "Motivation to learn is alterable; it can be positively or negatively affected by the task, the environment, the teacher, and the learner," speaks directly to the importance of motivation, while principles nine and ten focus on the importance of time, effort, and practice in learning. According to Angelo, research reveals that we can increase a student's motivation to learn if we can positively influence that student's belief and expectations in four key areas. First, students need to see the value of what they are learning; second, they need to believe that learning will help them achieve other important goals; third, they need to believe that they are capable of learning it; and fourth, students must expect that they will succeed. [Angelo, 1993, 7]

The basic idea behind the ninth principle is that students need to know that learning takes both time and effort. Angelo believes that students need to know "going in" that learning will require both effort and a considerable amount of studying time on their part and students need to know that the object of studying is to learn the material, no matter how long it takes [ibid., 6]. With the tenth principle**,** "Learning to

transfer, to apply previous knowledge and skills to new contexts, requires a great deal of practice," Angelo relates that most learning is highly "context-bound" and few students become skilled at applying what they've learned in one context to another similar context. The author contends that many students cannot recognize things they've already learned if the context is shifted at all. [ibid., 7]

Angelo's Recommendations for Application. To emphasize the importance of motivation, it is suggested that instructors should give students plenty of specific examples of the value and usefulness of what they are learning and help them make connections between short-term course goals and their own long-term goals. Angelo also advocates that instructors use simple, anonymous surveys to assess students' expectations, beliefs, and self-confidence levels. The instructor can then respond to the student's information with specific examples and realistic encouragement. Angelo also believes that instructors should continually direct the student's attention between the general and the specific. In addition, the students should be asked to identify and create similar but different examples or problems for themselves. [ibid.]

Other Recommendations for Application. In his "Empty Bus" article on good teaching, Bartlett states: "There is no trick at all to teaching brilliant, highly motivated students. The challenge comes in teaching those less committed at the start" [1993, 446]. Quddus and Bussing-Burks [1997] also believe a student's degree of motivation is a major factor in determining how much is learned in the classroom and suggest that instructors should encourage students to form study groups for motivation. As indicated earlier, Becker and Watts [1995, 692] have suggested different alternatives to the passive-learning approach that should motivate the student to learn as well as challenge them to develop better decision-making and problem-solving skills.[7]

In their article concerning the value of using a principal-agent experiment, Ortmann and Colander [1997, 449] believe that classroom experiments such as the principal-agent can motivate students to far more sophisticated economic ideas that go beyond what the more routine presentations are capable of. By structuring teaching around formal models, as opposed to a case-study structure, Colander [2000, 77-80] believes introductory economics becomes boring because students do not know the language of these models—mathematics.[8]

The Importance of Setting High Goals and Expectations

Angelo's third and eleventh principles speak directly to the importance of setting high goals and high expectations. The importance of goal setting and the achievement of those goals is supported by research that reveals that when learners know what their educational goals are and figure out how they can best achieve those goals, they become more efficient and effective learners. In addition, research reveals that younger students, like those in an introductory principles class, tend to achieve more by working with teachers who expect more of them. [ibid.]

Angelo's Recommendations for Application. Angelo believes instructors should find out what students expect of themselves, let them know what the instructor expects from them, and then discuss these expectations. Instructors should ask students early in the semester to write down specific objectives or goals they hope to achieve from the class. Those goals can then be assessed and compared to other students' goals and the instructor's goals for the class. [ibid.][9]

Other Recommendations for Application. Quddus and Bussing-Burks [1997, 55] also believe that goal setting by students is a critical factor in determining how much students can learn and the grade they receive in that class. The authors suggest that setting a goal early in the course may encourage the student to strive throughout the semester to meet the self-imposed goal.

In his article comparing teaching economics with driving a bus, Bartlett [1993] states that the economics instructor should establish clear goals and objectives for the class by making the "destinations" of the "journey" clear. Bartlett also suggests that the instructor should make sure that students also understand the goals of the course by seeing that all the "riders" (students) are going the same direction. Although Bartlett believes it is "unconscionable" for a teacher to ask more of students than they can achieve, he also believes it is "unconscionable" for a teacher to ask less because asking for less restricts success. [1993, 441-6]

The Importance of Instructional Support

A fifth theme around which four principles cluster is the idea that teachers need to offer considerable instructional support to students. In particular, Angelo's twelfth principle, "To be more effective, teachers need to balance levels of intellectual challenge and instructional support," speaks directly to the importance of instructional support. Angelo emphasizes that the weaker the student's foundation in the subject, the greater the need for instructional tutoring and support. Students of lower ability or weaker preparation often benefit the most from highly structured courses because they need the "scaffolding". [Angelo, 1993, 7]

In addition to the twelfth principle, Angelo's fourth, fifth and sixth principles also address the importance of instructional support for the student. The fourth principle emphasizes the connecting of new information with previously learned information, while the fifth principle, "Unlearning what is already learned is often more difficult than learning new information," suggests that habits, preconceptions, and misconceptions can be formidable barriers to new learning.

To Angelo, the fifth principle is particularly important because prior learning is 90 percent hidden from view, and before we can help students to unlearn or correct prior learning, we need to first know something about what is below the surface. With his sixth principle, "Information organized in personally meaningful ways is more likely to be retained, learned, and used," Angelo tells us that humans are extraordinary "pattern seekers" who are always seeking regularity and meaning and who create patterns even when they are not apparent or appropriate. [ibid., 6-7]

Angelo's Recommendations for Application. To provide instructional support and help students to connect new information with previously learned information, Angelo suggests that the instructor should provide many and varied examples, illustrations, and descriptions of the new information. In addition, the instructor should ask the students to provide their own examples and illustrations and offer continuous feedback to their examples in terms of application and correctness. [Angelo, 1993, 5]

Because habits, preconceptions, and misconceptions can be formidable barriers to learning and because we only see a small part of what the student believes or knows, before presenting new material Angelo believes the instructor should ask a few questions designed to find out what students actually know and believe. The instructors might learn that they will have to do more in class than originally expected or even learn that the students are actually further along and know more than expected. [ibid., 5-6]. To help students organize information in a "meaningful way", instructors can show students a number of different, useful, and acceptable ways to organize the same information, such as graphs, outlines, and models. [ibid., 6][10]

Other Recommendations for Application. In his "Empty Buses" article, Bartlett [1993] maintains that it is important to remember that the purpose of the bus ride (the class) is to get the passengers (students) to the end of the line; the purpose is not the bus. Because the purpose of the class is to get the student to learn economics, Bartlett believes tutoring and instructional support are essential to the undergraduate introductory class [1993, 441-6].

As indicated earlier, Colander [2000, 78-80] also believes it is important to separate the teaching of formal models from the teaching and learning of economic ideas. Colander [1995, 187] states that "textbook models" used in the introductory class should illustrate a way of thinking, rather than being a replacement for thinking. In "Teaching Keynes in the 21st Century," Colander reinforces this same message when he says economics should be used as "an engine of analysis, not as a set of principles" [1999, 370].

The Importance of Focusing the Student's Attention

According to Angelo, one of the most difficult tasks faced by the student is to figure out what to pay attention to and what to ignore. Angelo's second principle, "Learning requires focused attention, and awareness of the importance of what is to be learned," speaks directly to the importance of focusing the attention of the student. Although it could be included under instructional support, focusing the student's attention appears to be so essential to improving teaching and learning in the introductory economics class that it warrants individual attention. [Angelo, 1993, 5]

Angelo's Recommendations for Application. To focus the attention and direction of the class and make students aware of what is to be learned, Angelo suggests that instructors can provide pre-class guidelines or outlines of the key points on the board. In addition, he recommends use of the "minute paper" to find out what students thought were the most important points made in that class and what questions

they have about that day's lecture. These "minute papers" can then be used to provide guidelines, correct problems, and assess the class's level of understanding. [ibid.]

Other Recommendations for Application. Becker [1997, 1361] also advocates the use of the "minute paper" for use in introductory economics classes. Becker suggests that students should be given the minute paper during the last minute of class and asked to answer two questions, "What was the most important thing you learned today?" and "What question is unanswered?" Becker believes that these minute papers will also offer incentives for both attendance and participation. Chizmar and Ostrosky [1998] conclude that the minute paper does enhance economic knowledge, and the positive effect of the minute paper varies little across instructors and does not depend on the student's ability level. In his article comparing teaching economics with driving a bus, Bartlett [1993, 442] supports Angelo's second principle when he states that the "reasons for the journey" (the importance of what is being learned) should always be made clear to the "passengers" (the students).

RECOMMENDATIONS

Given Angelo's fourteen principles, certain classroom activities would appear to improve "what we teach, how we teach, and the assessment of the educational outcomes." These activities would include:

(1) group activities and group assignments,
(2) in-class student participation,
(3) use of the "minute paper",
(4) providing many and varied examples, illustrations, and descriptions of new material and relating that new material to prior knowledge, and
(5) continuous and frequent feedback to the students.

In addition, Angelo's work would suggest that instructors should also encourage other activities in and out of the classroom. These activities would include:

(1) the instructor should emphasize the importance of, and encourage students to, form study groups;
(2) the instructor should create an atmosphere of high expectations and achievement in the classroom;
(3) the instructor should encourage students to achieve those high expectations and succeed;
(4) the instructor should emphasize the role and importance of goal setting for the students;
(5) the instructor should understand the importance of structure and organization for class assignments, the course outline, and the presentation of material;
(6) the instructor should inform and emphasize to the students the importance of both time and effort to learn and understand economics; and
(7) the instructor should give students a clear understanding of the type of exams that wil be given and the type of questions that will be asked.

Angelo's principles also suggest that instructors should develop a "personal touch" with the students. Activities that could foster this personal touch would include:

(1) interacting with students whenever possible;
(2) encouraging students to seek help and tutoring whenever necessary;
(3) making themselves available to students;
(4) surveying students to determine what they already know or don't know about economics; and
(5) surveying students to determine what their personal goals are for the course.

In conclusion, it seems evident that Angelo's fourteen principles are indeed applicable to undergraduate economics classes and offer excellent opportunities to improve both teaching and learning in the introductory economics class.

NOTES

The author wishes to thank an anonymous reviewer for his or her excellent comments and suggestions.

1. Becker and Watts suggest that the lecture and chalkboard approach to undergraduate introductory economics classes is based on the traditional view that sees the teacher as a "preacher" and the students as passive receptacles into which great thoughts and wisdom are poured [1995, 692].
2. Becker and Watts state that the failure of undergraduate economic classes to use available alternative methods reflects an "equilibrium in which teaching efficiency, if not effectiveness, has been achieved" [1996, 451-452].
3. Higher learning represents "an active, interactive process that results in meaningful, long-lasting changes in knowledge, understanding, behavior, dispositions, appreciation, belief, and the like" [Angelo, 1993, 4].
4. Differences in universities, classes, students, and instructors would suggest that Angelo's principles cannot be applied uniformly across the board for all undergraduate introductory economics classes. Angelo emphasizes that "faculty members themselves will have to figure out whether and how these general principles apply to their particular disciplines, courses, and students" [1993, 3-4].
5. For example, Ortmann and Colander state that a simple, flexible and instructive moral hazard experiment can demonstrate the importance of institutional arrangements and show how slight changes in institutional design can lead to significant changes in the outcome [1997, 449].
6. For Walstad and Becker, the major disadvantage of multiple-choice exam is that fixed responses tend to emphasize recall and encourage guessing [1994, 193].
7. Becker and Watts believe that as economists, we should recognize that if students are not motivated and do not like economics, in the long run students will vote with their feet and enrollment will fall [1996, 452]. If we are seeking to build enrollment, Becker [1997] suggests that the uninterested and unwilling student is the very student that we should be interested in reaching [1997, 1366].
8. With the historical approach, case studies are seen as the raw materials from which students generalize from examples to principles rather than apply principles developed in models to cases [Colander, 2000, 78-80].
9. Angelo also suggests that the course should begin with assignments that diligent students could accomplish and do well because this success builds confidence and lets students know that even though expectations are high, those expectations can be achieved. [Angelo, 1993, 7]
10. One place where the importance of organization appears is the instructor's syllabus. For example, Lippman [1999] maintains that it is important for the instructor to construct and provide an elaborate and detailed syllabus with due dates for papers, exams, topics, and required reading for the lectures [Lippman, 1999, 62].

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