

Whittmore, M. J. (2002). *A study of conditions affecting advanced placement scores*. [Online.] Available: <http://www.utdallas.edu/dept/SciMathEd/SER>.

### **Abstract**

This paper will examine factors contributing to Advanced Placement (AP) course implementation and provide information to a medium-sized school offering AP courses that has experienced limited success over the past several years. Teachers and administrators have met to determine problems unique to this high school. Because the school is located on an island and isolated, it is more difficult to obtain information from other high schools with strongly established AP programs that might be able to offer guidance. It is the purpose of this paper to collect information from schools and present the results for future studies to this high school.

Methods of collecting information for research will involve studying College Board publications and various educational literature for a base of comparison. In addition to general information on Advanced Placement implementation, questionnaires will be sent to high schools and examined for AP scores and any reoccurring behaviors exhibited by these schools.

College Board's policies are committed to the principle that all students deserve an opportunity to participate in rigorous and academically challenging courses by offering college-level courses to high school students. "Secretary of Education Richard Riley set a goal of having AP available to all students in the nation by 2002" (The College Board, 1999). To reach this goal, an enormous collaboration must take place by all stakeholders before one student ever steps into the classroom. Teachers must be given opportunities for professional development to become successful. Under represented groups must be encouraged and given the opportunity to participate in AP. Parents must be informed in order to support their children as they learn the skills involved in critical and analytical thinking necessary for success in challenging courses.

As AP courses expand in popularity, it becomes increasingly important to understand the scope and depth of the program in maintaining academic excellence. Because administrators' backgrounds can span all levels from kindergarten to high school, it is not fair to assume that all [administrators] are aware of AP's complexity. It is a necessity to ensure administrative personnel who are key in curricula decision-making become knowledgeable of College Board's expectations and goals.

### **Introduction**

This study examined the dynamics involved in producing effective Advanced Placement (AP) programs by investigating different high schools' programs in comparison to current research defining successful advanced placement programs. The results of this study will be presented to a high school in the Department of Defense school system where low advanced placement scores have occurred. These low scores and a lack of improvement over the past years is an area of concern for educators, administrators, and parents.

In fall 2001, Advanced Placement teachers within the Department of Defense met to begin addressing issues unique to the particular high school that might be contributing to consistently low AP Exam scores (see Table 1). The following is a list of concerns and questions that arose as a result of that meeting:

- ? Student attitude toward test
- ? Why are students doing poorly on the exam but well in class?
- ? A local university does not grant credit for the AP Exam.
- ? Students have weak preparation entering AP courses.
- ? Should there be a final assessment after the exam?
- ? Our students do not value this exam.
- ? What do teachers do the past two or three weeks of school?
- ? Should all students take the exam? And who should pay?
- ? Where should this school be regarding a statement of ongoing teacher training?
- ? Fundamental problems with the school's AP program need to be addressed in the
  - ? following areas: a selection process, miscellaneous student requirements, summer
    - ? reading, and written guidelines in place in the spring for student scheduling.

An item on the 2001 Spring Agenda of College Board's Advanced Placement Program stated the plan to establish and fund a study that will gauge effective instruction and justify an empirical, operational definition of 'effective instruction' in relation to specific AP courses (The College Board, 2000). Unfortunately, such data is not yet available.

This information would be very useful for this paper since a definition 'effective instruction' according to AP standards could be used as an assessment tool for this high school in analyzing causes of low scores. However, enough information exists to perform a study based on ideas and values set forth by the AP Commission in 1999 (The College Board, 2001). They are:

- ? Offering AP in every school carries with it a commitment to quality and support.
- ? AP teachers are the heart and soul of the AP Program.
- ? College and university faculty play critical roles in AP and their continued support and participation must be assured.
- ? Continued acceptance by colleges and universities of the validity of the content of AP course, the validity and reliability of the AP Examinations, and the integrity of the scoring process is critical to AP's success.
- ? AP can enrich teaching and learning in high school in many ways.
- ? Although the rapid expansion of AP to every high school is not within the College Board's control, the College Board will be help responsible for it.
- ? AP can succeed only as a collaborative program. (The College Board, 2001, p. 5-6).

Obviously, all these cannot be studied in one paper, but several apply directly to the knowledge, preparation, and implementation of Advanced Placement courses. It is the goal of this paper to show that without initial administrative understanding, progress in this program cannot occur.

## **Review of Literature**

AP courses, during their infancy, were primarily found in Northeast preparatory schools in the 1950's: today urban and rural public schools in all states and territories offer AP courses (The College Board, 2001a). In recent years, pressure from educators, politicians, and parents has changed the landscape of education as more programs have been developed to meet the needs of special groups of students. This, in part, has resulted in a tremendous amount of growth in AP enrollment as students seek challenging courses in their transition into college.

A common theme resounds in AP literature: strong administration, teacher, parental and community support. These are not incidental. These are necessary. According to A Secondary School Guide to the Advanced Placement Program, "two keys to AP success are preparations and motivation" (The College Board, 1996, p. 17). Training teachers and registering students is not enough "to fulfill the College Board mission to champion excellence for all students" (The College Board, 2001b). Being knowledgeable, and prepared creates a base for implementation that ensure students have the best opportunities to succeed in their chosen AP courses.

**Knowledge: THESE ARE COLLEGE COURSES!**

AP courses make substantial academic demands on students. It is critical for school personnel to relay this fact to students so realistic expectations exist. The same level of writing abilities, analytical skills, and self-discipline required of college students should be adopted by high school students. AP exams are offered each spring: they are an important part of the program providing pay-off for students in terms of college credit and advanced placement, and offering feedback on strengths and weaknesses of courses. Schools that weather initial low scores and disillusionment usually increase students' performances in following years. Regardless of scores, "students and faculty are profiting from the higher levels of teaching and learning that accompany AP" (The College Board, 1996, p. 24).

AP courses are taught by high school teachers. Course descriptions can take several years to develop and are developed by committees of university and experienced AP teachers. Task forces investigate proposed courses by determining if colleges will award credit and if high schools have proper capabilities. Courses are then surveyed by colleges and universities to ensure high school AP course will be representative of the equivalent college courses. In the end, college students pre-test AP exams for relevance. Exams are then analyzed statistically (The College Board, 1999).

It may help administrators and teachers to review AP Course Description booklets provided by the College Board before any serious planning occurs. Each course has its own characteristic complexity which can help shape an initial program. The following are examples from a few course descriptions that illustrate this.

*AP Mathematics: Calculus AB and Calculus BC*

Students enrolling in calculus should demonstrate mastery of algebra, trigonometry, analytical geometry, and elementary functions, or four full years of previous mathematical preparation. This is the hurdle of this course. Prior planning and scheduling by involving grade 8 algebra, taking more than in an academic year, or accelerating capable students are options to consider before offering AP Calculus. A plan addressing four years of prior math is imperative for this course. Additional

requirements of the courses involves the “use of well-written sentences to both explain solutions and to model a written description of a physical situation and the availability of technology to students” (Advanced Placement, 1996, p. 1-2).

### *AP Language and Composition*

“The AP Language and Composition course assumes that students already understand and use standard English grammar” (Advanced Placement, 2001a, p.8). Students who have strong writing skills in place will benefit best. Students need opportunities and considerable time to read widely and reflect on their reading through extensive discussion, writing, and rewriting to develop sophisticated, interpretive writing skills. Curriculum material for this course is one of the most varied.

### *AP Sciences: Biology and Chemistry*

Of primary concern to secondary schools that wish to offer AP science courses is being prepared to provide a laboratory experience equivalent to that of a typical college course (Advanced Placement, 2001b). “School administrations should be aware that an AP college-level laboratory is significantly more expensive to operate than a typical high school biology laboratory and requires more time than non-laboratory courses” (Advanced Placement, 2002a, p. 21). “Many teachers have indicated that their administrations do not fully realize the implication, both in cost and time, of incorporating serious laboratories into their programs” (Advanced Placement, 2002a, p. 21-22). While non-science educators understand the importance of laboratory work, the degree of its value is not always appreciated. The positive correlation between high science achievement through laboratory investigations and laboratory practicals has been monitored extensively in England (The Texas Science Teacher, 2001, p. 25). The chemistry course description goes to great lengths to stress that “administration must make an appropriate commitment for successful implementation of an AP Chemistry course in laboratory chemistry” (Advanced Placement, 2001b, p. 37). These commitments are described as including facilities, teacher prep time and training, scheduling and supplies. It would be useful to establish a separate operating budget with the understanding that the per pupil expenditures for these courses will be substantially higher than those for regular high school laboratory science courses (Advanced Placement, 2001b, p. 37).

For science courses, time is also an issue: for classes, for teachers, for students. Flexible or modular scheduling must be implemented. Chemistry guidelines state a minimum of 290 minutes per week should be allocated, with 90 minutes, preferably in one session, be used for lab. “It is not possible to complete high-quality AP laboratory work within standard 45- to 50-minute periods” (Advanced Placement, 2001b, p. 37). Most of the recommended 22 labs have estimated times of two or more hours. This book also states that it is assumed that the student will spend an additional five hours a week in individual study. The teacher needs extra time to prepare also. “An AP Chemistry teacher routinely requires one extra period each week to devote to course preparation” (Advanced Placement, 2001b, p.38).

### *AP U.S. History*

Because historical facts are not emphasized in this class, students of AP History are assumed to have general concepts of key historical events that are expected to be incorporated into student essays. In U.S. History the document-based question (DBQ) is unique and different from the typical essay. The DBQ is an interpretation utilizing the students ability to analyze and synthesize historical data that has been presented verbally, quantitatively, or pictorially. Students need developed skills in expressing their views based on argument and supporting evidence (Advanced Placement, 2002b, p. 18-19). “Striking a balance between teaching factual knowledge and critical analysis is a demanding but crucial task in the design of a successful AP course in history” (Advanced Placement, 2002b, p.4).

From these examples it is clear that students must have certain skills and knowledge in place prior to taking these courses. Therefore, school administrators in positions to make course decisions must be aware of these for preparation to be most effective.

### **Preparation:** *COMPLEX DYNAMICS ARE INVOLVED IN INSTRUCTION.*

Gauging effective instruction involves relationships between many variables. Teachers’ academic preparation, professional development, years of experience, financial budgeting, and scheduling are key concerns in preparation. Training is the first step in preparing for an AP program. The College Board offers administrative workshops that provide a forum for information about the program, ongoing changes, and opportunities to exchange information with other administrators. Teacher workshops and training institutes are intensive learning sessions in which content, methodology, and resource materials are covered in subject-specific courses. “While textbooks serve as valuable references, they cannot always be exhaustive and up to date. Professional development, especially in remaining current with new discoveries and conceptual trends, is one responsibility of any AP instructor” (Advanced Placement, 2002a, p. 20). Principals say that the summer institutes are critically important (The College Board, 1996) to AP teacher preparation because, periodic surveys of college courses result in course descriptions being updated every two years (The College Board, 1996).

To ensure proper preparation, it is recommended that school administrators give teachers advanced notice of their AP assignment, send teachers to training institutes, and modify class size and the number of preparations for AP teachers to ameliorate the greater preparation time required (The College Board, 1996). Appointing an AP Coordinator is also recommended.

An issue not often addressed is a teacher’s personal motivation. If these courses are rigorous for the students, even more so are they for the faculty responsible for delivery and guidance. Maintaining teacher morale is the responsibility of both administrators and teachers. “Successful AP courses are taught by skilled, enthusiastic teachers” (The College Board, 1996, p. 39). Regarding training and its effectiveness, according to Foxon (1994, p. 2) “no matter how well designed . . . there is an inevitable degree of artificiality about it [training].” For training to be effective, teachers must be held accountable in some way for the implementation of their learning, and there must be a perceived level of administrative support. For all teachers, positive attitude correlates with motivation, especially in the outcome of any type of training (Foxon, 1993, p. 5).

Encouraging morale can be accomplished by realizing the complexities of AP courses and doing what is possible to reduce class loads, provide increased opportunities to train, and continually evaluate progress of the program.

Two important potential problems recognized by College Board need to be addressed before programs are in place and should be monitored through subsequent years: AP teachers versus non-AP teachers. Teachers may feel they will be adversely evaluated if students perform poorly on AP exams. Many factors influence scores. College Board encourages all students be admitted to AP courses if adequately prepared. If pressure exists to produce high scores, all but the highest achievers will be discouraged from participating. Scores should not be used to punish teachers or schools. If exam scores do not meet reasonable expectations over a period of years, then all factors should be scrutinized very carefully. Non-AP faculty members should also be considered when discussing morale issues. They may feel discriminated against by the reduction in load or extra supplies received by AP teachers. "The laudatory attention that AP often receives from parents and school officials may compound the problem" (The College Board, 1996, p. 40). Practicing the attitude of one AP teacher from a Department of Defense School located in Europe would help alleviate the conflict sometimes associated with this situation. After being recognized by The College Board for her student AP exam achievement, she acknowledged the collaborative effort of all teachers on her campus by pointing out that without strong foundations in place previous to her course, student success would be difficult. Furthermore, she stated that successful AP exam scores were indicators of school strength at all levels, because consistently producing good exam scores would not be possible if students were only challenged on her campus once they entered AP courses (Department of Defense Education Activity, 2002).

Planning for the preparation of students years before entering an AP course is an essential goal. Pre-AP courses and vertical teaming are two approaches. Introducing skills associated with AP early in junior high or high school will help attain equity and excellence. By planning to build rigorous curricula early, access for all students into AP can be promoted. Vertical alignment is a guided program in which teachers of specific subject areas create curriculum strategies from junior high level through the AP course. High school educators utilize strategies, skills, and habits of mind that are grade level appropriate. Conferences and workshops exist for both of these initiatives (The College Board, 2001b). Pre-AP courses are taught at the high school level. These are not courses to be followed with an exam, but a set of recommendations and curricula by College Board to be incorporated by schools before certain AP courses are taken. All teachers desiring to integrate Pre-AP strategies will need to attend Pre-AP professional development.

Money and budgeting are of primary concern mainly with AP sciences. In addition to the enormous task of developing a traditional college-level laboratory, technological expenditures must be considered also. Fortunately, most technological expenses can be used in lower level science classes also. According to Barnea and Dori (1999, p. 258-259) inaccurate perceptions can be corrected by spatial models to help students with three dimensional concepts. Computer-based labs (CBL), special programs to help visualize spatial concepts, adequate student-to-computer ratios present in the actual lab [as opposed to a computer lab] are all costly and require present and future planning.

Various effects are being studied regarding class scheduling. Block scheduling is becoming more common in high school across the U.S. Single semester scheduling poses the greatest problem to AP courses: fall courses may be finished months before the exam and the high volume of student work necessary may be overwhelming while spring courses will not be able to cover all material before the national mandated exam dates. Schools that teach AP courses for a double block [two periods back-to-back] the first semester and a single block [one period] the second semester provide students a strong learning environment by increasing the number of instructional hours. But this is a cautious statement as College Board notes that studies comparing traditional versus block schedules are few (The College Board, 1996, p. 23-25). It is also recommended to start small by offering fewer courses and making additions to school curricula over a period of time. In a 1995 study by University of Georgia professor Carl Glicman, 820 high schools and 1,100 middle schools reported that schools in which active learning methods were predominant had significantly higher academic achievement as measured by The National Assessment of Education Progress. Active learning includes extended exercises such as quizzes, special projects, writing assignments, labs, and hands-on practice of lessons tagged onto the traditional teacher's lecture and student's note-taking. The traditional class period does not allow for active learning methods, because the time restraints on the school day must include adequate time for five to eight class periods, transitions between classes, and the teacher administrative tasks for each period (Drexel, 1996, p. 2). Cooperative learning can be utilized to help maintain high academic standards, also (Kagan, 1993: Cohen, 1994). However, cooperative learning also requires extended class time for various activities. Slavin states (1990, p.53) that two essential elements that characterize cooperative learning are positive interdependence and individual accountability, which are also two elements inherent to AP courses. High school students gain an appreciation of these skills early by learning to monitor their study time and by experiencing their teachers and classmates as facilitators as they undertake, for the first time, college-level coursework.

A noteworthy alternative to traditional scheduling is distance learning or independent study. Experience with independent study indicates that about 90 minutes of tutorial with a teacher is required. For students in distance learning, a mentor should be assigned to supplement instruction. Oklahoma State University telecasts some courses with opportunities for interaction with instructors and evaluation of students by university faculty. Motivation, for AP students is especially critical here. Students have to be faithful to a work schedule.

**Implementation: *FINALLY READY!***

With groundwork in place, implementation can begin by informing students and parents of the AP program with general guidelines and course-specific information. For those who are not among the best-prepared or who are not in the top 10-15% of their class, sustained effort to do the work must be stressed. It is also recommended that no more than two AP courses be taken concurrently without a school policy addressing this situation.

Addressing student concerns is important. They worry about the impact to their grade-point average if low grades in AP are attained. Students can be encouraged by weighting AP grades and also ensuring them that colleges see AP courses as evidence of

academic motivation. All students deserve to be challenged without being overwhelmed, so proper communication about the expectations with prospective students should be a prime goal of all schools.

Developing written guidelines for student selection is useful. General rules can clarify student expectations and encourage common standards for teachers, and are helpful in admitting and retaining students, and establishing policies concerning who will take the exam (The College Board, 1996). This can help avoid many future problems. Some schools admit all students in an open enrollment. With such a process, it is recommended to provide tutoring and allowances made for student transfer if the course is too demanding. Other schools use academic grades, teacher recommendations, parent/student requests, class ranking, and/or standardized test scores. Whether a school chooses to be restrictive or relaxed, each position has advantages and drawbacks. Regardless, the position should be made clear to students, parents, teachers, and administrators.

Benjamin Banneker High School in Washington, D.C is 90 percent African American. By its seventh year, almost half of the AP students received scores of 3 or higher. According to AP Coordinator Jacqueline Pegram, a key element to the school's success has been parental involvement (The College Board, 1996, p. 51). All concern need to be addressed with parents well before their children choose to take an AP course. Parents can be helpful in guiding their children's success if they understand what will be expected from the beginning, because they are almost uniformly supportive of AP programs (The College Board, 1996). Sometimes they can be a little too enthusiastic about their children enrolling and can encourage them to take classes they do not want nor are prepared to take. Parental support will be necessary when students begin to feel overwhelmed at certain times. It is also wise for parents to know that they and their children may need to choose school work over other activities.

## **Method**

The instrument, a questionnaire, was developed to obtain qualitative information from high schools. Questions were developed based upon the areas of concern determined by teachers (see Introduction). It is hoped that in the analysis information from other schools may be used to determine what schools are actually doing compared to suggested guidelines published by College Board. The questionnaires will be analyzed and compared to school AP exam scores to determine if parallels exist between any schools and AP Exam scores.

The packet mailed included a cover letter and survey questionnaire, found in Appendices B and C, and return envelope. The cover letter included a request to return all information within two weeks.

## **Results and Analysis**

Eleven of eighteen questionnaires were returned. AP Exam scores for 2001 were used in this analysis. School A represents the high school that will be utilizing this information and will be referred to as such throughout this discussion of results and analysis. School A is unique because approximately 80% of the student body is fully bilingual with Spanish being the first language. This had a positive impact on the overall percent (27.8%) of students who passed the 2001 AP Exam with a 3 or higher score

(Appendix A). In studying individual AP exams scores, percents were 50 or below for all courses except English Literature and Spanish Language. This same pattern was observed in the 2000 AP exam results. No study has been done to evaluate this, but this paper is making an inference that knowledge in one language may indirectly ensure a higher degree of success in another language AP exam for purposes of test comparisons.

The most direct correlations that existed between instrument items (see Appendix C) and AP exam scores of three or higher involved extensive planning. Certain items resulted in such varied responses that no inferences could be made. Class size, regular vs. block scheduling, amount of time spent in class, additional planning time, separate AP coordinator, and limited class size were all factors involved in the planning phases. It is clear that Advanced Placement programs should adhere to the same preparation as other programs addressing the needs of a special population. Student preparation prior to the AP course such as pre-AP courses, student meetings prior to enrollment, and screening processes existed in most schools. Enthusiastic teachers, teacher preparation and support existed as on-going training, separate budgets, and administrator understanding.

Other factors that deserve mention occurred in the four schools scoring in the highest percentile, 45% or more. Three of these schools gave their administrators the highest rank on 'AP understanding'. These schools had separate AP coordinators but did not require all students to take the AP exam. This fact, most likely, impacted the inflated grade percents. Teachers attended AP training at least every three years.

School A had never met with students previous to enrollment, no informative parent meetings had ever occurred, only one teacher has received any updated training within the past five years, AP budgets exist only after other classes needs had been met. In the final analysis of this study, teachers belief in their administrators' understanding of AP courses, faith in teachers' ability to prepare students in lower level courses, and their own ongoing training, and not requiring all students to take the AP Exam produced the highest correlation to scores or three or higher. Of all these though, preparation was the most outstanding feature. Teachers ability to prepare themselves and students, and administrators ability to support this effort. All other items on the questionnaire were either inclusively related or indirectly related, again, to planning and preparation, such as class size or budgetary needs.

Near the end of this study, the following statement was found and poignantly reflects the conclusion of this paper. It was made by a Department of Defense teacher whose syllabus was selected by College Board. The statement reads: [She] "insists that the recognition for this outstanding honor is not hers alone. This recognition of [school] is a testament not only to the AP [course] Program but to the strong academic program offered by the school in all curricular areas. Students cannot achieve in AP [course] without also having the necessary science and math backgrounds given to them by their other high school teachers. They also have to be able to write their explanations clearly. Writing is a cross curricular skill which is nurtured in the English classes, but through high expectations in content areas, content teachers also nurture the proper use of the written word. [Teacher] also emphasized that students that take AP classes are highly motivated and dedicated. The quality work which [school] students exhibit in this national test is recognized by The College Board" (Department of Defense Education Activity, 2002.).

Future studies of school expectations and the rigor of non-AP courses and dedication of teachers might supplement this information. More areas for written teacher responses on the questionnaire might have been beneficial also. A study of individual teachers who have a history of successful AP exam scores would probably provide the best picture of what high schools should be doing.

### **Conclusion**

Administrators play a key role in assuring success to AP. Rushing to install AP courses in schools that have not adequately prepared will create future problems. In an effort to avoid that, administrative understanding of the program is absolutely essential. Guidelines and tools can help schools understand how to start an AP program or evaluate the effectiveness of an existing program.

A future study of schools with high percentages of AP exam scores that are three or higher would be useful to draw a realistic picture of what is happening in relationship to recommendations.

## References

- Advanced Placement. (1996). *Course description: Calculus*. Educational Testing Service.
- Advanced Placement. (2001a). *Course description: Literature and composition*. Educational Testing Service.
- Advanced Placement. (2001b). *Course description: Chemistry*. Educational Testing Service.
- Advanced Placement. (2002a). *Course description: Biology*. Educational Testing Service.
- Advanced Placement. (2002b). *Course description: U.S. history*. Educational Testing Service.
- Barnea, N. and Dori, Y. (1999). High-school chemistry students' performance and gender differences in a computerized molecular modeling learning environment. *Journal of Science Education and Technology*, 8(4), 257-271.
- Center for Education Reform, The. (1996, November). *Scheduling: On the block*. [www.collegeboard.org/ap]
- Cohen, E.(1994). *Designing groupwork: Strategies for the heterogeneous classroom*. New York: Teachers College Press.
- College Board, The. (1996). *A secondary school guide to the advanced placement program*. Educational Testing Service.
- College Board, The. (1998, May). *Block schedules and student performance on AP examination*. (Issue RN-03). [www.collegeboard.org/ap]
- College Board, The. (1999). *How AP courses and exams are developed*. [www.collegeboard.org/ap]
- College Board, The. (2000). *Best strategies for starting an AP program*. [www.collegeboard.org/ap]
- College Board, The. (2001). *Access to excellence*. College Entrance Examination Board.
- College Board, The. (2001b). *Expanding student access to AP: "AP in every school"*. [www.collegeboard.org/ap]
- College Board, The. (2001a). *From humble beginnings*. [www.collegeboard.org/ap]

- College Board, The. (2001, Spring). *Gauging effective AP instruction*. [www.collegeboard.org/ap]
- College Board, The. (2001) *Pre-AP initiatives*. [www.collegeboard.org/ap]
- Department of Defense Education Activity. (2002). [www.www.dodds-e.odedodea.edu/aso/news.htm]
- Drexel, D. (1996). *Building block or stumbling block? A look at block scheduling in mathematics education*. National Council of Teachers of Mathematics: News bulletin. 1 – 2.
- Ferguson, K., Quintero, E., and Westerlund, J. (2001). Texans in London? A comparison of Texas and British science education through the eyes of Texas student teachers. *The Texas Science Teacher*, 30(2), 22-26.
- Foxon, M. (1993). A process approach to the transfer of training. Part 1: The impact of motivation and supervisor support on transfer maintenance. *Australian Journal of Educational Technology*, 9(2), 130-143.
- Foxon, M. (1994). A process approach to the transfer of training. Part 1: Using action planning to facilitate the transfer of training. *Australian Journal of Educational Technology*, 10 (1), 1 – 18.
- Kagan, S. (1993). The structural approach to cooperative learning. *Cooperative Learning: A Response to Linguistic and Cultural Diversity*. 9-19.
- Senge, P. (1994). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday.
- Slavin, R. (1990). Research on cooperative learning: Consensus and controversy. *Educational Leadership*, 47 (4), 52-54.

## Appendix A

### School A AP Exam Scores

<u>Exam</u>	<u>2000</u>	<u>% scoring 3+</u>	<u>2001</u>	<u>% scoring 3+</u>
U.S. History	2/22	9.1	0/12	0.0
Biology	1/9	11.1	1/4	25.0
Chemistry	--	--	1/2	50.0
Computer Science	1/8	12.5	2/6	33.3
Govt/U.S. Politics	4/31	12.9	4/26	15.4
Calculus AB	2/23	8.7	3/16	18.8
Statistics	1/11	9.1	0/9	0.0
English Lit/Comp	9/24	37.5	8/14	57.1
Spanish Language	5/10	50.0	8/8	100.0
Spanish Literature	11/11	100.0	--	--
<hr/>				
<b>TOTAL</b>	<b>36/149</b>	<b>24.1</b>	<b>27/97</b>	<b>27.8</b>

## Appendix B

### Cover Letter

My name is Mary Jon Whittemore; I am a Masters degree candidate in the Science Education Program at The University of Texas at Dallas. I am conducting an investigation on the implementation of Advanced Placement courses in high schools. I would like to learn what schools with high percentages of students scoring 3 or higher on the AP exams might have in common. School and teacher names will not be used in the final report.

My goal is to provide this information to a school within the Department of Defense that is currently in the process of studying what might be done to improving student success on the AP exam. Because most Department of Defense schools are located off the mainland of the United States, I hope this information may help provide information and initiate communication among teachers and administrators within this unique setting.

If you decide that you would like to be a part of this study, I have included the questionnaire and a self-addressed stamped envelope. Please return the questionnaire within two weeks if possible.

You may contact me the phone number or email address listed below. Thank you for your time.

Sincerely,

Mary Jon Whittemore

Email: [maryjonw@yahoo.com](mailto:maryjonw@yahoo.com)

Home phone: 787-706-1921

## Appendix C

### Advanced Placement Study Questionnaire

1. Do AP teachers at your school collaborate through an established AP department?    YES    NO
2. Does your school have an AP Coordinator separate from your school counselor?    YES    NO
3. Do you have input in the AP student selection process?    YES    NO
4. Do you have additional planning time as an AP teacher?    YES    NO
5. If NO to #4, is there an alternative to your AP schedule?    YES    NO  
If YES, please explain.
6. Do AP classes have separate budgets?    YES    NO
7. Does your school offer pre-AP courses?    YES    NO  
If YES, please list pre-AP courses:
8. Does your campus administration understand the complexity of the AP course? (5 being highest AND 1 being lowest)    1    2    3    4    5
9. Do your students attend classes daily?    YES    NO
10. Do your students attend class on a block schedule?    YES    NO
11. How many minutes are spent in AP classes over a two week period?    300-400 min  
400-500 min
12. How often do you attend follow-up training?    every year  
2-3 years  
4-5 years  
5 + years
13. Does your school meet with prospective AP students the prior spring?    YES    NO
14. Is there a screening process for AP student selection?    YES    NO
15. Do AP classes have a maximum student/teacher ratio?    YES    NO
16. Do all students enrolled in AP classes take the AP exam?    YES    NO
17. How does your school deal with remaining class days after the AP exam?  
Please explain.
18. Who pays for the cost of the exam?    Student    School
19. Does your school limit the number of AP courses a student can take per year?    YES    NO  
Please note the maximum number.    \_\_\_\_\_