

MEETING THE CHALLENGES
IN EDUCATION
FOR THE INFORMATION ERA

BY

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ABSTRACT

Research literature and press articles were reviewed concerning the issue of how well prepared high school graduates are to meet the challenges of the Information Era. A survey was formulated to measure the degree to which Paradise Valley Unified School District high school educators felt that their graduates were prepared for a future in the workplace of the Information Era. The survey was sent to all three high schools in the Paradise Valley School District. A total of 200 surveys were sent to district administrators, high school principals, department chairpeople, and high school teachers. The results of the survey indicated that on the average, P.V.U.S.D. high school educators agreed that their high school graduates were prepared to meet the challenges of the Information Era.

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CHAPTER 1

INTRODUCTION

THE PROBLEM

How well prepared are Paradise Valley Unified School District High School graduates for the Information Era?

BACKGROUND OF THE PROBLEM

During the industrial age the requirements of society were very different from what will be expected or required in the post-industrial or information era as pointed out by Peter Drucker in 1989. Today's society requires a different kind of worker and thinker. The time is long past when America's destiny was assured simply by an abundance of natural resources and inexhaustible human enthusiasm, and by our relative isolation from the malignant problems of other older civilizations (Drucker, 1989). We live among determined, well-educated, and motivated competitors. We compete with them for international standing and markets, not only with products but also with the ideas of our laboratories and

workshops (Naisbitt, 1984). As John Naisbitt also points out, "America's position in the world may once have been reasonably secure with only a few exceptionally well-trained men and women. It is no longer." The risk is not only that other countries are producing machinery and products more efficiently than America (Naisbitt, 1989). It is also that these developments signify a redistribution of trained capability throughout the globe. Knowledge, learning, information and skilled intelligence are the new raw materials of international commerce and are today spreading throughout the world vigorously (Naisbitt, 1989). If only to keep and improve the slim competitive edge we still retain in world markets, we must dedicate ourselves to the reform of our educational system for the benefit of all--old and young, affluent and poor, majority and minority. Learning is the indispensable investment required for success in the "information age" we are entering (A Nation At Risk, 1983)

The people of the United States need to know that individuals in our society who do not possess the levels of skill, literacy,

and training essential to this new era will be effectively disenfranchised, not simply from the material rewards that accompany competent performance, but also from the chance to participate fully in our national life. (A Nation At Risk, 1983)

A high level of shared education is essential to a free, democratic society.

During the industrial age the requirements of society were very different from what will be expected or required in the post industrial or information era. Today's society requires a different kind of worker and thinker. White collar workers already outnumber blue collar workers in technical, managerial and clerical positions (Naisbitt, 1984). Because of this trend, education has become our dominant resource, a catalyst of an informed society (Naisbitt, 1984). The quality of our influence and leadership both at home and abroad depends more than ever on our educational systems - how demanding, relevant, continuous, broad and wise our learning is (Halan Cleveland, 1986). "The people who don't learn to participate in an information-based society will be it's peasants." (Halan Cleveland, 1986). U.S. Bureau of Labor Statistics

projects that required skill levels are increasing in both occupations with the fastest rates of growth and in those occupations projected to add the greatest number of new jobs in the next decade (Kolberg, 1991).

We are shifting from an industrial society to one based on the creation and distribution of information. We, therefore, must understand this new information society and what changes and expectations it brings. We continue to use methods and materials of the industrial age to prepare our children for life in the rapidly changing information age (Kinnaman, 1991). The emphasis from producing goods has changed to an emphasis on using, creating and distributing information. "In this new society, value is increased by knowledge" (Naisbitt, 1984). The United States cannot be competitive in a worldwide marketplace until it improves the education of people available to work in its businesses (Kolberg, 1991).

STATEMENT OF PROBLEM

What are the expectations of the post- industrial era on

education? What can schools do to ensure that our future workers are able to help America retain it's competitive edge? Although it is thought that education is tied to larger social, political and economic issues, and that education renewal is the key to American renewal, it is also believed that schooling is only one facet of education and that lifelong learning through a host of public and private institutions and personal means will continue to be an important part of this transition. Nevertheless there is strong support for the proposition that schools must continue to develop academic competencies, foster vocational skills and awareness, contribute to personal fulfillment and cultivate civic responsibility (Cleveland, 1986).

SIGNIFICANCE OF STUDY

Industrial-age members of society were raised in an era when much of the knowledge they gained in school stayed useable for years after the educational process (Naisbitt, 1984). In comparison, the rapid expansion of current knowledge base supports the notion that the textbook as a source of information

for future use is obsolete (Toch, 1991). The challenge of all educators is to help pupils survive in a world where the needed information does not exist yet (Naisbitt, 1984). The students will have to be prepared to access and apply this information (Naisbitt, 1984). This supports a need to build information management skills, develop an ability to manage the tools of the information age, and to develop and assess future needs (Naisbitt, 1984). In education there is a need to move from short-term to life-long continued education, and retraining. Instructional content availability and quality instruction will need to be emphasized (Toch, 1991).

What are schools, specifically high schools, doing now, and what will they need to do, to prepare students, who are our future workers, for this new "Information Era"?

High schools are already raising their requirements for more science, math and writing subjects (Morganthou, 1990). Other areas of emphasis are analytical methods, social knowledge, leadership skills, personal responsibilities, psychology, integrative

thought, and ethics. Students are expected to become independent, creative, problem solvers and information handlers. Many high schools are changing curriculum goals, content, and processes in response to challenges and opportunities posed by the information era (Bracey, 1993). Although high schools are aware of the changes needed, there is also an interest in reassessing the specific curriculum, skills, and knowledge necessary in an information-based society. Needs being assessed include the formulation of and communication of problems to others, locating sources of information related to defined problems, selecting, modifying, and/or developing calculating methods for solving problems, managing information, using available data and analytical tools to solve problems, estimating, iterating and defining communication problems, and communication with others (Papert, 1990). The emphasis in computer technology as it applies to education will need to be in using it and the information gained from it rather than just how to operate or program it (Collins, 1991). As computers take over some of the basics of education (as in math

computation and word processing) schools will be called upon more and more to take more responsibility for spending more time teaching values, ethics and motivation (Collins, 1991). Computer literacy will help students manage the information era only to the extent that its members are skilled in utilizing it (Papert, 1990). Emphasis will be on what to do with the information obtained from the computer rather than how it was obtained (Sheingold, 1991). Familiarity with computers will be considered a strong vocational advantage, a necessary tool for the information era (Sheingold, 1991). As written by Phillip Schlechty in 1989, serious educational change takes time and money: we need to invest in a small number of proven programs and make sure that they are properly implemented and are making the differences they should make.

PURPOSE OF STUDY

Educators and educational administrators are witnessing the challenge that the information era poses for the children of our society. It is a challenge that has far reaching implications for

students and graduates of our country. The purpose of this study is to examine the opinions of experts in the Paradise Valley Unified School District about the training of high school students and to sample their opinions on how well Paradise Valley Unified School District high school graduates are prepared to meet the challenges of the information era.

SIGNIFICANCE OF STUDY

Our society has changed and is continuing to change from one of heavy industry to one that depends on information from its workers. In our society already 50% of the people earn a living with knowledge acquired through formal education, not on-the-job experience (Drucker, 1989). In the information era, this percentage will be higher.

In order to function in the information era, every worker will need a basic, formal education. Although schools do an adequate job of educating their students, more will need to be done, changes will have to be made, and standards will have to be higher in order for graduates, who are the future workers of America, to meet the

challenges of this new era.

There are areas in the high school curriculum that already do meet these challenges and prepare graduates for the future work force. There are also areas of the high school curriculum that fall short of that goal. The significance of this study is that it will point out the areas of strength and weakness in the P.V.U.S.D. high school curriculum, as it relates to the needs of the future work force, in the opinions of the district administrators, high school administrators, high school department chairpeople and high school teachers.

LIMITATIONS OF STUDY

Because the purpose of this study, as described in Chapter 1, is to examine the opinions of experts in the Paradise Valley Unified School District and to sample their opinions on how well the PVUSD high school graduates are prepared to meet the challenges of the information era, the fact that the PVUSD educators were used to evaluate their own programs and students is not limiting, but accurate. By examining and evaluating their own programs and

students, they can see what areas showed any weakness at all and target those areas for improvement. In 1991, Daniel Kinneman found that using a variety of methods, both formal and informal, the planning team should gather data about the following: the district's problem areas (i.e., gaps between where it is and where it wants to be); its successes (including ongoing needs that are currently being met but that might be jeopardized by changes in school structures or functions); and built-in barriers to the types of change that might be necessary to address the problems. The survey as presented to PVUSD educators would be one way of gathering the data needed in order to begin planning for change.

RECOMMENDATIONS:

In order to get a broader perspective of how other educators feel that they are preparing students for the information era, surveys could be done in other districts, at the college level, and in other states. It might also be valuable to get input from parents and area business leaders to see how well prepared they feel high

school graduates are for jobs in the information era.

DEFINITION OF TERMS

Information Era -- the post industrial era ended in the late 1950's. The name for the industrial era was coined by sociologist Daniel Bell. The post-industrial society is the information era or information age (Naisbitt, 1984)

strategic resource - main asset.

curriculum - all of the sources of study in a school.

literacy - the condition of being literate. People who are literate can read and write. Literate people are literate and have knowledge.

P.V.U.S.D. - Paradise Valley Unified School District.

CHAPTER 2

LITERATURE REVIEW

The search for solutions to our educational concerns must include a commitment to life-long learning (A Nation At Risk, 1983). At the heart of society is the commitment to a set of values and to a system of education that affords all members the opportunity to stretch their minds to full capacity, from early childhood through adulthood, learning more as the world changes (Futrell, 1989). Such a society has as a basic foundation the idea that education is important not only because of what it contributes to one's career goals, but also because of the value it adds to the general quality of one's life (Futrell, 1989). Formal schooling in youth is the essential foundation for learning throughout one's life (A Nation At Risk, 1983). The search is on, by both political and educational leaders, to find specific needs that can be met through our educational systems. These are the needs, that if met, can enable our students to function, compete and succeed in the

information era (A Nation At Risk, 1989).

There are certain characteristics that are specific to companies that are considered successful. These characteristics include skills that high school graduates could acquire in their high school curriculum (Hunter, 1987). Graduates possessing these skills would be able to function successfully in the workplaces of the information era. Successful workplaces are action-oriented, use teamwork, promote experimentation, encourage risk-taking, communicate in a variety of ways, tolerate failure, express respect for the individual, have a lack of rigid hierarchy, and support values (Thomas J., Peters and Robert H. Waterman, Jr., 1983). There is an enormous difference between the work environment described in workplaces of the information era and the work environment experienced by most students in secondary schools (Beverly Hunter, 1987). According to Cleveland (1986) goals that should be included in a high school curriculum should include integrative brainwork, social knowledge, a capacity for Self-analysis, practice in real-world negotiations, psychology, leadership, and a global

perspective (Toch, 1991). Also, in support of a new curricula, computer-based tools should be used to help students solve problems, address problems in all disciplines, gain access to information, organize and communicate ideas, collaborate with peers, experiment, invent and learn appropriate uses of technology. (Hunter, 1987). Some researchers support the idea that computers need to be a part of the school curriculum and not limited to computer science courses. (Collins, 1991). In another study it was suggested that schools use computers to acquire and process information and to develop higher level thinking skills in reasoning and analysis. (Hunter, 1987) It was also recommended that knowledge of the computer is basic to understanding of the full range of procedures that may be applied to solving problems in fields as diverse as mathematics, science, social studies, business, industry, language, and the arts (Sheingold, 1991).

A society dependent on information technology soon will develop more demand for people capable of maintaining, and even operating

machinery (Shiengold, 1991). Seymore Papert (1980) states that he sees the classroom as an artificial and inefficient learning environment that society has been forced to invent because of its informal environments fail in certain learning domains, such as writing grammar, or math, and that he believes that the computer presence will enable people to modify the learning environment outside the classroom. In another area of educational curriculum concern, John Naisbitt (1984) points out that in the literacy intense information era we will need basic reading and writing skills more than ever before. "To do the jobs people want done, students will need enhanced ability in using language," as Peter Drucker (1989) emphasizes. Workers will need more than ever to be able to ask incisive questions, put masses of data in coherent form, and communicate increasingly involved messages to both machines and people (Naisbitt, 1989). An ideal and effective high school curriculum might be one that includes communication skills, writing, reporting, editing, and foreign languages (Schlechty, 1989).

Two required languages for the information era will be English, and computer (Naisbitt, 1984).

Education must equip students to be workers who determine how society is run. In order to do this, schools must improve dramatically in three basic areas of instruction. The first area is basic skills, including verbal, mathematical, scientific literacy, as well as a capacity to reason logically. Second, students must acquire political and philosophical training to carry out the role of running our society. And third, the educational system must be open -- all of it's members must be educated. (Drucker, 1989).

The research literature has many common recommendations for the American education system. The recommendations could be grouped into categories that would include recommendations for curriculum, recommendations about teachers and teaching, recommendations about school organization and management, and recommendations about various roles society plays in the educational system. As students prepare for college they find

themselves being asked to possess a solid background in mathematics and science, the ability to read, write and reason critically, and to have a healthy and broad interest in activities that give meaning to life. These possessions will have to be acquired in the high school curriculum.

Educational institutions have the responsibility to provide leadership for the information age. Not just facts, but knowledge and understanding. Not only tables and statistics, but comprehension. Today's world requires a different kind of worker and thinker than the schools were set up to produce. School administrators and teachers working together can create a new learning environment that can produce the problem-solving, motivating, questioning, team-spirited individuals who can function in the information society.

As the United States braces itself to enter the 21st century, our children emerge from high school to face the information era. This study will focus on the recommendations for curriculum

and which of those recommendations are being included in the curriculums of the Paradise Valley Unified School District high schools.

CHAPTER 3

METHODOLOGY

The purpose of this descriptive case study is to find out how well prepared P.V.U.S.D. graduates are for the Information Era. Through the literature research, statements about what skills and knowledge are needed to meet the challenges of the future workforce were discovered. These statements were compiled into a survey that would find the degree to which P.V.U.S.D. educators felt that their high school graduates were attaining these recommended skills and knowledge.

The survey was designed using 25 statements from recognized sources, that emphasized the necessities in a high school curriculum for preparing students for a place in the Information Era. Each statement was followed by a 7 point scale. The points on the scale were indicative of the degree of agreement or disagreement with each statement, 7 being strongly agree, and 1 being strongly disagree. The number that indicated the respondents

degree of agreement or disagreement was to be circled. The survey was sent through the in-district mail to P.V.U.S.D. district level administrators, high school principals (including assistant principals) high school department chairpeople, and high teachers. Two hundred surveys were sent out. One hundred and thirty seven surveys were completed and returned. There was a sixty-nine percent return rate.

CHAPTER 4

DATA ANALYSIS

As the surveys were returned through the district mail, the results were tabulated by overall responses and were then divided into the biographical categories and tabulated again. The number of surveys sent out and returned were entered on Table 1. The surveys returned were divided into three biographical categories: position, teaching experience and highest degree obtained. The total number of responses in each category were listed as well. This would show what the overall opinion of the P.V.U.S.D. personnel was and would also show if there was a difference of opinion between one biographical category and another. These averages were entered on the same scale that was used in the survey. The averages for each specific biographic category were displayed on a table. There was one table for each category. By averaging the responses and entering them on the survey scale, and then on the table by

biographic category, the opinions of the sample population became clear.

TABLE 1

Number of surveys sent out	200
Number of surveys returned	137
Percent of return	69%
BIOGRAPHICAL DATA	
The surveys were analyzed in the following categories	
Position	
Administator	12
High School Principal	8
Department Chairperson	24
High School Teacher	93
Total number of responses	137
Teaching Experience - 1-4 years	11
5-10 years	28
more than 10 years	98
Total number of responses	137
Highest Degree Obtained -	
BA/BS	45
ED. SPEC.	5
MA/MS	85
Doctorate	24
Total number of reponses	137

OVERALL ASSESSMENT

It's always important in the analysis of statistical data to select some kind of systematic way to review the important points of the data collected.

In this particular survey, given that there were twenty five individual questions, I have decided to examine those questions which received the highest overall rating by each respective group and those questions that received the lowest overall rating. The cut off for each of those indicators simply rested with a judgement call which related to the top three or four ratings on an individual question and the lowest three or four ratings on an individual question.

Some interesting patterns emerged that will be discussed in the conclusion section which follows. This particular section will deal with the reporting of the appropriate assessment areas, beginning with the overall assessment and following with the data collected from the responses by job title, years of experience and degree obtained.

The overall assessment from the hundred and thirty-seven respondents (Table 2) indicates a narrow range of high to low. The preponderance of the scores being in the 5 to 5 plus range indicates a strong sentiment of opinion about the various questions. Therefore when one examines those scores that were the three highest and the three lowest one gets a pretty clear indication of the strength of their opinion with respect to that question.

In terms of the overall assessment provided by all respondents, the highest scores were indicated on questions number three - PVUSD educators expect students to strive to become problem-solvers, question number thirteen - PVUSD educators encourage mastery of skills beyond the basics, and question number twenty one - PVUSD teachers have adequate knowledge of the subjects they teach and question number twenty two - PVUSD educators offer advanced subject matter in the form of honors programs, advanced placement courses and/or preparatory curricula. and last of the highest scores, this question number twenty three, PVUSD graduates acquire the cognitive skills that will allow them to engage in highly complex tasks.

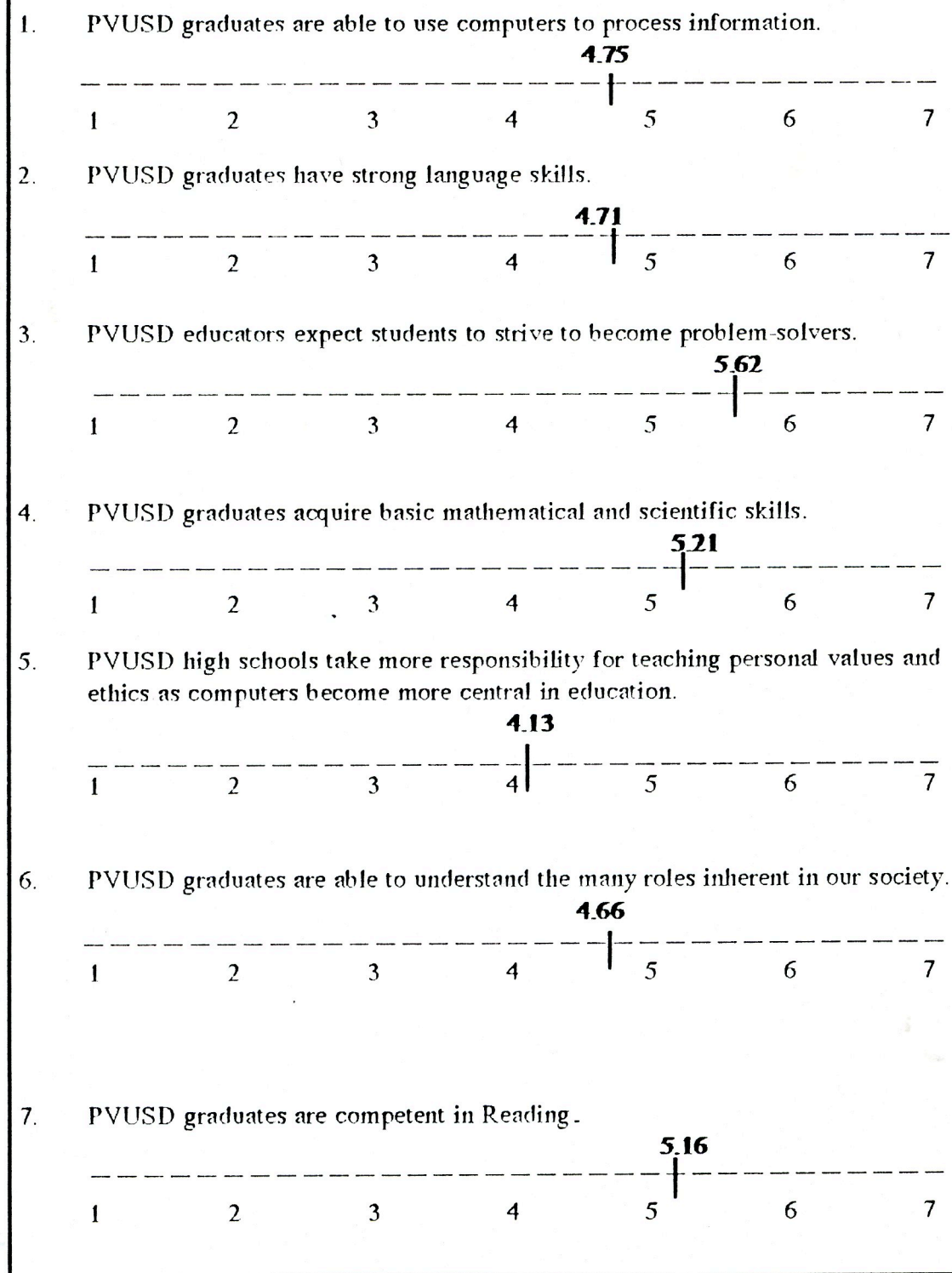
When one considers these four questions together we see that there is a strong indication by all participants of teacher knowledge of the subject matter, or preparation of students in highly complex tasks as well as advanced curricular offerings. No doubt these are also followed with a strong indication that the PVUSD educators expect the students to become problem solvers. The results of these questions indicate a strong confidence level in student preparatory resources, as well as results.

When one compares the strongest question areas, with the weakest, some other interesting conclusions can be drawn. Among the lowest scores received in the overall assessment of the survey were question number five - PVUSD high schools take more responsibility for teaching personal values and ethics as computers become more central in education, question number twelve - Leaders from education and business work actively to establish a partnership using teacher and specialists from industry, and question number 24 - PVUSD graduates acquire the ability to communicate in one or more foreign languages. These three areas were judged by the respondents to be of their lowest confidence

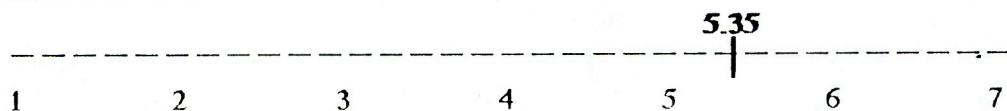
level. It is however important to know that low confidence level was still in excess of a neutral score of four, but indicated the least strength of determination of confidence in these questions. The analysis of this data indicates that foreign languages, use of outside resources as well as some type of personal values clarification activities in light of computer training are not strong suits of the PVUSD as seen by all respondents.

All of the other scores of the respondents therefore were within this band of 4.29 to 5.40 indicating that the majority of scores were therefore within a one point swing on the Likert type scale.

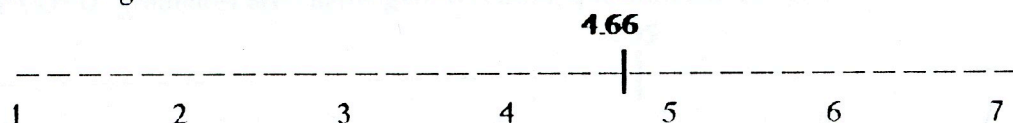
TABLE TWO



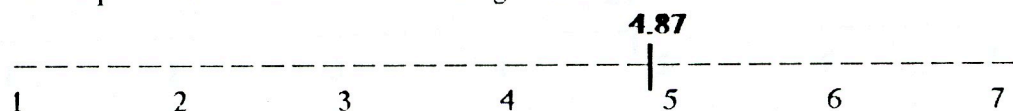
8. Educators create a learning environment that fosters the intellectuals and leaders of tomorrow.



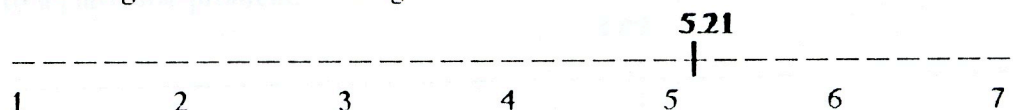
9. PVUSD graduates are able to envision future needs.



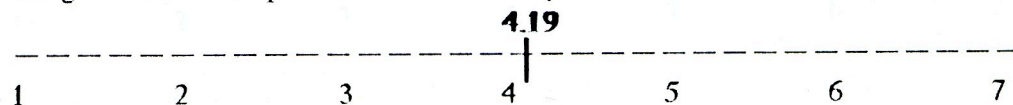
10. Instruction at PVUSD has enabled graduates to construct their own meaning and importance rather than memorizing facts.



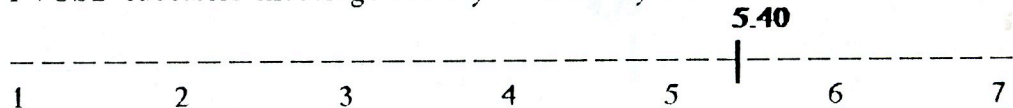
11. PVUSD graduates are challenged.



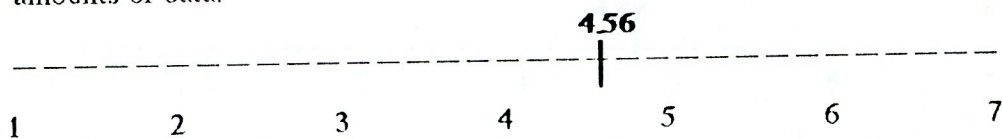
12. Leaders from education and business work actively to establish a partnership using teachers and specialists from industry.



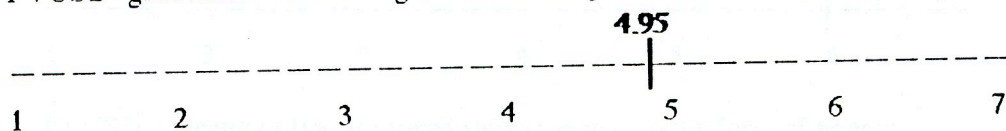
13. PVUSD educators encourage mastery of skills beyond the basics.



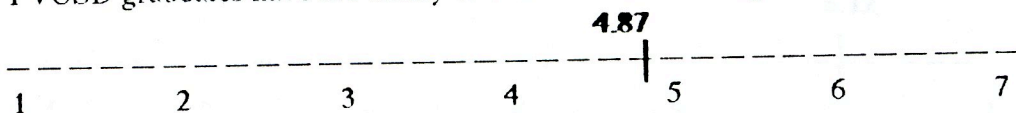
14. PVUSD graduates are able to ask incisive questions based on massive amounts of data.



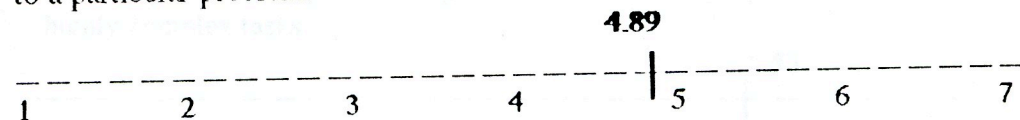
15. PVUSD graduates are challenged to reason, question and integrate information.



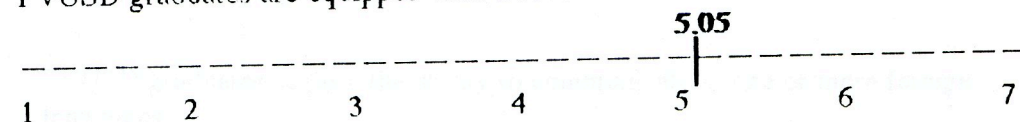
16. PVUSD graduates have the ability to infer various meanings in text.



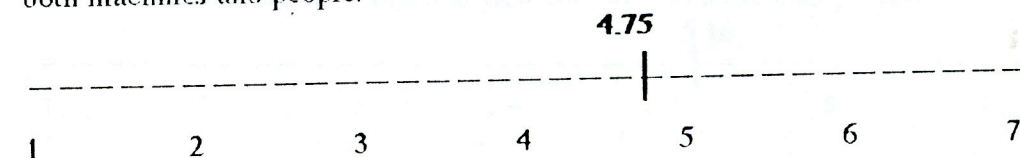
17. PVUSD graduates are allowed to explore a multitude of potential solutions to a particular problem.



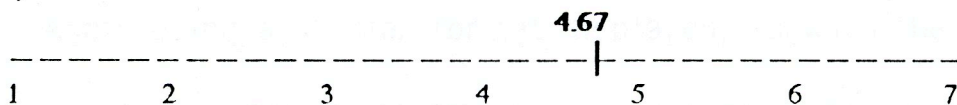
18. PVUSD graduates are equipped with a sound liberal arts education.



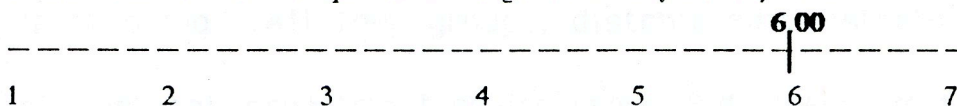
19. PVUSD students are able to communicate increasingly involved messages to both machines and people.



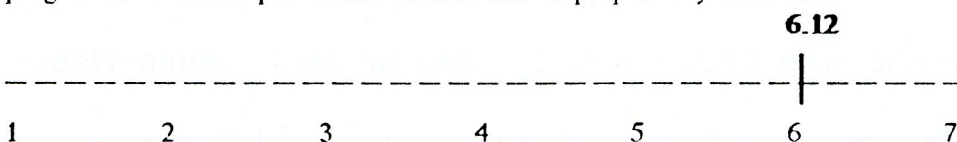
20. PVUSD graduates have skills that enable them to maintain the high -technology systems of our world.



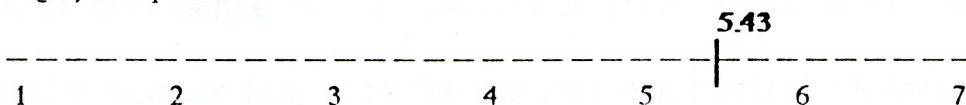
21. PVUSD teachers have adequate knowledge of the subjects they teach.



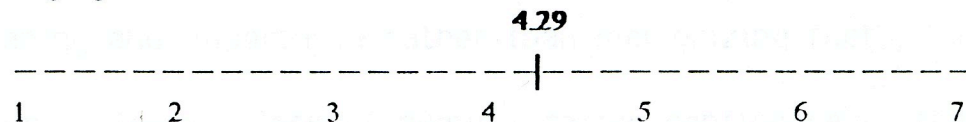
22. PVUSD educators offer advanced subject matter in the form of honors programs, advanced placement courses and/or preparatory curricula.



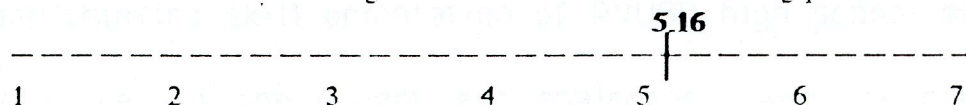
23. PVUSD graduates acquire the cognitive skill that will allow them to engage in highly complex tasks.



24. PVUSD graduates acquire the ability to communicate in one or more foreign languages.



25. PVUSD students are encouraged to view education as a life-long process.



Statistical Data Responses Categorized by Job Title

Again using a similar format displayed, as with the overall assessment, the analysis of data responses categorized by job title are interesting. All four groups, district administrators, high school principal, department chairpersons and classroom teachers rated question number five as one of the low confidence levels of the questionnaire. That question is that PVUSD high schools take more responsibility for teaching personal values and ethics as computers become more central in education, thereby indicating a lack of confidence in that particular area. Next, with respect to question number ten, both the district administrators and the high school principals indicated a low score on the question that instruction at PVUSD has enabled graduates to construe their own meaning and importance rather than memorizing facts, indicating again at least a lack of administrative confidence of the higher order thinking skill orientation of PVUSD high school students. The scores of the department chairpeople and the classroom teachers are not significantly low in these areas. With respect to question number twelve, Leaders from education and business work

actively to establish a partnership using teachers and specialists from industry, it was significant that the department chairpeople rated this as one of their lowest levels of confidence in the entire survey. This lack of confidence by department chairpeople casts their doubt on whether or not business partnerships are alive and well in the PVUSD. In addition to question number fourteen, the high school principals rated this area as one of their low points. This question was "PVUSD graduates are able to ask incisive questions based on massive amounts of data." The confidence level of principals is not high in this particular area. With respect to department chairpeople their analysis that in addition to questions number five and twelve, question number twenty four - PVUSD graduates acquire the ability to communicate in one or more foreign languages, is not high on the confidence level of those department chairpeople indicating that foreign language study is a low confidence factor with respect to department chairpeople.

When one examines the classroom teacher situation, as already mentioned, they are strong, along with all other groups, in

feeling a low confidence level in respect to question number 5. They, also like the district administrators and the department chairpeople, indicate a low confidence level with respect to question number twenty four about foreign language communication.

In terms of areas indicated as high confidence level by job title, district administration sees question number sixteen - the ability to infer various meanings in context as being high as well as question number twenty one, that teachers have adequate knowledge of the subjects they teach. In question number twenty two - PVUSD educators offer advance subject matter in the form of honors programs, advanced placement and/or preparatory curriculum, the district administration has a high confidence level that the PVUSD is performing well in these areas. The high school principals indicated two areas of high confidence and those are question twenty one dealing with adequate knowledge of subject matter and twenty three, that PVUSD graduates acquire the cognitive skills allowing them to engage in highly complex tasks. One can compare that with the department chairpeople who also

responded with a high confidence level with respect to adequate knowledge of subject matter as well as advance subject matter taught in the schools. That confidence level was displayed by the classroom teachers as they indicated high scores on both questions twenty one and twenty two. On table # 1 you can see that questions twenty one and twenty two dealing with adequate knowledge of subject matter and advanced subject matter taught have overall responses by job title of the high confidence nature.

JOB TITLE	DISTRICT	HIGH SCHOOL	DEPARTMENT	CLASSROOM
	ADMINISTRATOR	PRINCIPAL	CHAIRPERSON	TEACHER
	N=13	N=7	N=24	N=93
QUESTION NUMBERS				
#1	5.07	4.85	4.58	5.12
#2	5.15	4.85	5.45	4.83
#3	5.46	5.57	5.09	5.66
#4	5.69	5.71	5.04	5.75
#5	L 4.30	L 4.00	L 4.01	L 4.20
#6	5.07	5.14	4.58	4.66
#7	5.46	5.42	5.08	5.41
#8	5.53	5.28	5.35	5.20
#9	5.30	5.00	4.96	4.87
#10	L 4.61	L 5.00	4.88	5.12
#11	5.38	4.71	5.15	5.29
#12	4.84	4.85	L 4.09	4.95
#13	5.61	5.42	5.30	5.79
#14	4.84	L 4.14	4.50	4.62
#15	5.23	5.28	4.83	5.25
#16	H 5.84	5.00	4.83	5.00
#17	5.00	5.85	4.91	4.83
#18	5.30	5.85	4.94	5.16
#19	4.84	5.85	4.79	4.79
#20	5.00	5.14	4.61	4.50
#21	H 5.92	H 6.42	H 5.87	H 6.20
#22	H 6.07	5.85	H 5.97	H 6.45
#23	5.69	H 6.28	5.04	5.45
#24	L 4.46	4.86	L 4.27	L 4.04
#25	5.46	5.00	4.98	5.54

Years of Experience

With reference to teaching experience, the survey stratified the responses of teaching responses in the following areas: one to four years, five to ten years and ten years plus. In order to explain these responses in a consistent manner from here on in we will refer to the one to four teachers as probationary, we'll refer to the five to ten year teachers as experienced and we will refer to the ten year plus teacher as veteran teachers. Among the probationary teachers the ratings were at an extremely low confidence level with respect to four different question areas. Questions number two, that PVUSD graduates have strong language skills, question number five that PVUSD high schools take more responsibility for teaching personal values and ethics as computer become more central in education, question number twelve - Leaders from education and business work actively to establish a partnership using teachers and specialists from industry, and lastly, number twenty which is PVUSD graduates have skills that enable them to maintain the high technology systems of our world. Those low scores among the probationary teachers were balanced by four high

confidence level areas as question number nine - PVUSD graduates are able to envision future needs, questions number twenty one, twenty two and twenty three, which deal respectively with knowledge of subject matter, advance subject matter taught and cognitive skills that will allow them to engage in complex tasks, were among the strong confidence areas for probationary teachers. Among those teachers in the five to ten year range herein called experienced teachers there were two areas significantly receiving low scores and three receiving high scores. The two receiving the lowest scores were two that were included in the probationary teacher category and that is question number five - PVUSD teach personal values with respect to computers being involved in education and question number twelve which dealt with business and education forming partnerships. Both of these areas were also indicated as low confidence scores with probationary teachers. Among the areas of high confidence level, the experienced teachers rated three of the same four areas as the probationary teachers, these being question number nine, dealing with being able to envision future needs, as well as questions number twenty one and

twenty two which deal with teacher competence and advanced subject matter taught.

Lastly the veteran teacher group with ten or more years experience indicated three low areas of confidence again dealing with question number 5 which was equally rated low by the probationary and experienced teacher group. Question number five being the issue of personal values and ethics as relates to computers. Also question number twelve which deals with business and education partnerships. They added a new low rated score with respect to question number twenty four which states that PVUSD graduates acquire the ability to communicate in one or more foreign languages; a score that was rated low in the overall classification category as well. Again analysis of this data will follow in the next section.

TABLE 4.081 (TABLE)

TEACHING EXPERIENCE IN YEARS	1 TO 4 YEARS	5 TO 10 YEARS	10 YEARS PLUS
QUESTIONS NUMBERS			
#1	4.63	4.60	4.76
#2	L 4.18	4.60	4.77
#3	4.90	5.35	5.32
#4	4.54	5.17	5.26
#5	L 3.81	L 4.39	L 4.07
#6	4.45	5.25	4.58
#7	4.72	5.42	5.14
#8	5.00	5.67	5.25
#9	H 5.72	H 6.07	4.82
#10	4.70	5.14	4.74
#11	4.90	5.10	5.17
#12	L 4.18	L 4.32	L 3.68
#13	4.81	5.85	5.31
#14	4.45	4.82	4.62
#15	4.90	5.10	4.94
#16	4.63	5.10	4.87
#17	5.00	5.07	4.96
#18	5.27	5.00	4.47
#19	4.45	5.07	4.73
#20	L 4.18	4.92	4.59
#21	H 5.63	H 5.96	H 6.08
#22	H 5.54	H 6.10	H 6.02
#23	H 5.81	5.03	5.21
#24	4.36	4.64	L 4.22
#25	5.27	4.64	5.15

DEGREE OBTAINED

In the areas of degrees obtained, the data from those individuals with a bachelor's degree, those with a masters degree, those with Ed specialist and finally those with PhD degrees showed some similarities and some differences.

Among the similarities were as follows. Three of the groups, the bachelors, Ed specialists and PhD's rated a low confidence level with respect to question number one about PVUSD graduates ability to use computers to process information. The groups were unanimous in their low rating of question number five about taking more responsibilities in Paradise Valley for teaching personal values in ethics in relation to computers. Two of the four groups, the MA's and the Ed Specialists felt that they had a low confidence level with regard to question number twelve about business and education partnerships. Finally three of the four groups, the bachelors, the masters and the PhD's showed a low confidence level with respect to question number twenty four which deals with the teaching of a foreign language. The high confidence level areas were spread throughout the questionnaire with one strong high level

indicator. Question number twenty one which deals with PVUSD teachers having adequate knowledge of the subject matter they teach was unanimous of all four groups as a high ended survey question and therefore confidence level whereas question number twenty two was rated by the BA and MA individuals as having the highest confidence level. That question dealt with advanced subject matter. With the Ed specialist and PhD's, question number nineteen - PVUSD students are able to communicate increasingly involved messages to both machines and people it showed a high confidence level for those groups. A couple of isolated scores have the Ed specialist group rating question number three - PVUSD educators expect students to strive to become problem solvers, and question number eight - Educators create a learning atmosphere that fosters the intellectuals and leaders of tomorrow, being rated high by the Ed specialists degree individuals.

When one compares the data as presented in tables one, two and three plus the overall assessment with the analysis provided from the comparisons of the high confidence level scores and the low confidence level scores, some general conclusions emerge

which can be applied throughout the course of the survey. This paper is designed to answer the question about how effective a job is the PVUSD doing in preparing learners for tomorrow. That question will be answered in the next chapter.

DEGREE OBTAINED	BA/BS	MA/MS	ED SPEC	PH D
QUESTION NUMBERS				
#1	L 4.46	4.87	L 3.80	L 3.50
#2	4.53	4.78	5.20	4.50
#3	5.26	5.29	H 5.80	5.00
#4	4.88	5.37	5.20	5.50
#5	L 4.15	L 4.08	L 3.40	L 3.50
#6	4.88	5.17	4.60	5.50
#7	5.11	5.18	5.60	5.00
#8	5.15	5.35	H 6.00	4.50
#9	5.26	4.81	5.20	5.50
#10	4.93	4.83	4.60	4.50
#11	5.40	5.20	4.80	5.00
#12	4.62	L 4.00	L 3.80	4.00
#13	5.55	5.34	5.60	5.00
#14	4.68	4.45	4.80	5.00
#15	5.04	4.96	5.20	4.50
#16	5.08	4.90	5.00	5.50
#17	5.26	4.88	5.00	4.00
#18	5.04	5.08	5.20	4.50
#19	4.91	4.65	H 5.80	H 6.50
#20	4.82	4.60	4.60	5.50
#21	H 5.95	H 6.00	H 6.00	H 6.50
#22	H 6.00	H 6.28	5.60	5.50
#23	5.17	5.24	5.20	4.50
#24	L 4.51	L 4.22	4.40	L 3.00
#25	5.26	5.17	5.20	5.00

CONCLUSIONS

When one examines the data as presented in the analysis section, several conclusions are able to be gleaned on a rather consistent basis. The first conclusion is that the academic preparation in knowledge levels of PVUSD teachers is without doubt in the respondents judgement one of the strengths of the PVUSD. It is with a consistent judgement of the respondents that the advanced level subject matter taught to students in terms of honors and advanced placement courses is rigorous and produces significant results in terms of problem solving ability of PVUSD students.

It is also quite clear that the PVUSD educators are encouraging students to develop a mastery of skills beyond the basics. When one compares the high rated confidence level scores with the questions within the survey, we also see that the groups consider graduates as having acquired the cognizant skills that allow them to engage in highly complex tasks as they move to the

future. Overall, this indicates a tremendous amount of confidence on the part of the PVUSD educators in their own ability levels and in the challenging curriculum that they offer and in the results they obtain relative to problem solving skills and high order thinking skills. Generally, one can also see that there are some areas in which the PVUSD has exhibited a low confidence level with respect to certain areas. One is with the teaching of personal values and ethics as computers become more central in education; the second deals with business and education partnerships in which teachers across the board feel that this is a weak area for the PVUSD and that the PVUSD appears lacking in the area of graduates acquiring the skill and ability to communicate in one or more foreign languages.

When one examines these generalizations in terms of the various sub groups, some rather interesting conclusions emerge. They are as follows : All the sub categories relative to degree obtained, years of teaching and responses categorized by job title have, when examined together have a low confidence level on question five about ethics and computer teaching. You can also see

that with respect to question number twelve there is some consensus with respect to degree and years of teaching experience.

There is a degree of concern relative to question number twelve about the partnership between business and education. One can also see some incredible commonalities with respect to strengths as questions twenty one, twenty two and twenty three, all dealing with teacher competence, advanced level courses taught, and graduates acquiring the skills which will allow them to engage in highly complex tasks, all being rated high by the various sub groups. When one analyzes this data and then follows the conclusions that have been addressed, it becomes clear to this researcher that PVUSD is indeed providing a quality education program for students and that they are helping students meet the needs of a challenging career in the twenty first century. The strengths of the vehicle of providing that confidence comes from the knowledge imparted by teachers, their content orientation, their ability to motivate students toward highly complex tasks, the strength of advanced level curriculum, as well as the opportunity it

provides students for problem solving. When one compares these results with the research information provided in this survey we know that adaptability, flexibility, knowledge and problem solving skills are essential to future success. All indications from the survey are that the PVUSD has done this with its graduates. The challenge for the future is to increase the business and education partnership as well as strengthen of teaching in the foreign language areas so as to provide students with an effective international perspective. It is also significant that the PVUSD, like many school districts across the nation, as they prepare for the twenty first century, need to provide its' students with a discussion of the ethics and personal values involved in the use of computers which are becoming so important in the instructional pattern of the 21st century high schools.

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APPENDIX I

SURVEY AS PRESENTED

**THANK YOU FOR TAKING JUST 10 MINUTES OF YOUR
VALUABLE TIME TO HELP MY RESEARCH.**

Dear Volunteer,

As educators and educational administrators, you are witnessing the challenge that the Information Age poses for the children of our society. Computers, interactive technologies, multi-media and an often overwhelming amount of information is, even now, taxing our resources for management and comprehension. If we intend to survive in the world and effectively compete, we must be able to use the products and technology that the information age provides. The purpose of this inquiry is to sample your opinions of how well Paradise Valley high schools prepare students to meet the challenges of the Information Age. Specifically, I wish to know if you feel that the students who graduate from Paradise Valley high schools are prepared for the Information Age.

Although this survey is voluntary, I ask that you take 10 minutes and thoughtfully respond to each of the statements. Your responses are completely anonymous. The enclosed materials include a page that contains some questions concerning information about your background and experience and a set of 25 statements concerning issues about the Information Age. Please do not put your name, social security number, or any identifying information on any of the contents. I would be grateful if you could complete the survey and have it back to me, through the district mail, at the address below by December 17th, or return it to the following people: Rich Masterson at Horizon, Connie Liddle at Shadow Mountain, or Carol Kendrick at Paradise Valley. I greatly appreciate your help in this matter, and I thank you for your cooperation.

Judy Stollar
Liberty Elementary School
5020 E. Acoma
Scottsdale, AZ 85254

BIOGRAPHICAL INFORMATION

Present position (please check only one):

- 1) _____ District Administrator
 2) _____ High School Principal
 3) _____ Department Chair/Teacher
 4) _____ Teacher

Highest degree attained (please check only one):

- 1) _____ BA/BS
 2) _____ MA/MS
 3) _____ Education Specialist
 4) _____ Doctorate

Teaching Experience: (please check only one):

- 1) _____ 1 - 4 years
 2) _____ 5-10 years
 3) _____ more than 10 years

QUESTIONNAIRE DIRECTIONS

Please read each of the following statements and indicate how much you agree or disagree with that statement. Under each statement, there is a 7-point scale. **Choose a number on this scale that is indicative of your degree of agreement or disagreement with the statement and circle it.** Each of the points on the scale has a corresponding meaning. See the chart below for the number associations, then begin the questionnaire and return it to the appropriate person by December 17th or return it to Judy Stollar at Liberty Elementary School by way of District mail.

7 = strongly agree

6 = agree

5 = somewhat agree

4 = undecided

3 = somewhat disagree

2 = disagree

1 = strongly disagree

1. PVUSD graduates are able to use computers to process information.

Strongly Disagree **Undecided** **Strongly Agree**

2. PVUSD graduates have strong language skills.

Strongly Disagree **Undecided** **Strongly Agree**

3. PVUSD educators expect students to strive to become problem-solvers.

Strongly Disagree **Undecided** **Strongly Agree**

4. PVUSD graduates acquire basic mathematical and scientific skills.

Strongly Disagree **Undecided** **Strongly Agree**

5. PVUSD high schools take more responsibility for teaching personal values and ethics as computers become more central in education.

Strongly Disagree **Undecided** **Strongly Agree**

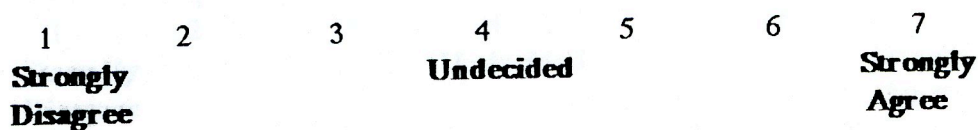
6. PVUSD graduates are able to understand the many roles inherent in our society.

Strongly Disagree **Undecided** **Strongly Agree**

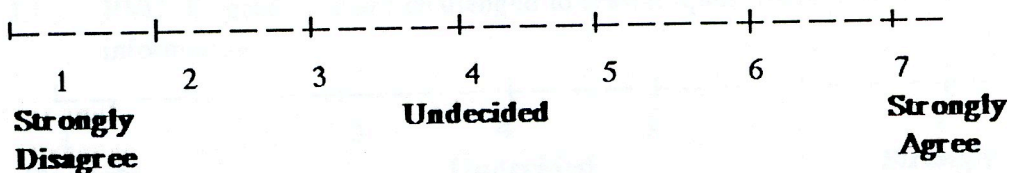
7. PVUSD graduates are competent in Reading.

Strongly Disagree **Undecided** **Strongly Agree**

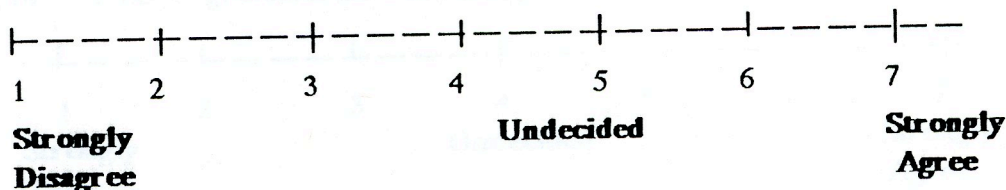
8. Educators create a learning environment that fosters the intellectuals and leaders of tomorrow.



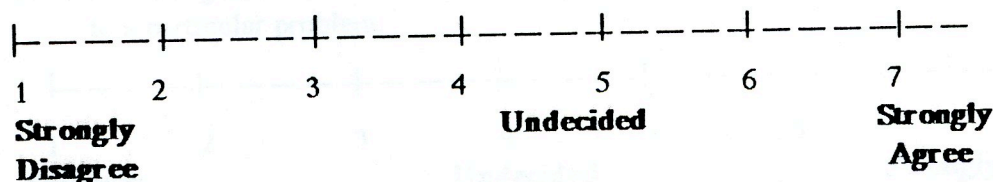
9. PVUSD graduates are able to envision future needs.



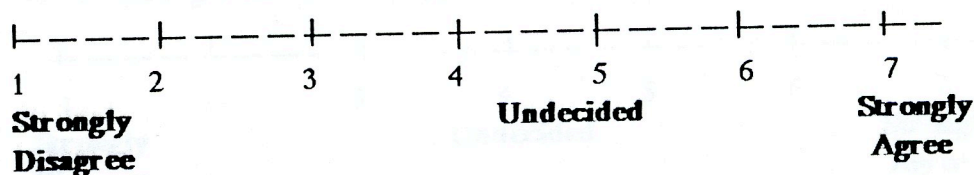
10. Instruction at PVUSD has enabled graduates to construct their own meaning and importance rather than memorizing facts.



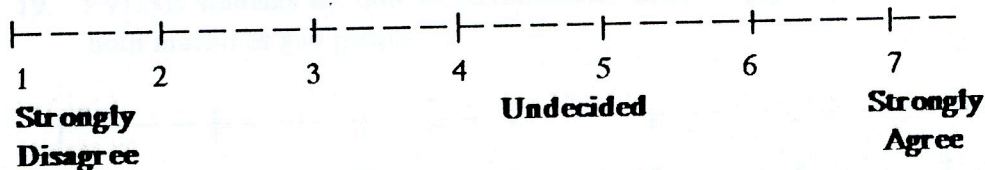
11. PVUSD graduates are challenged.



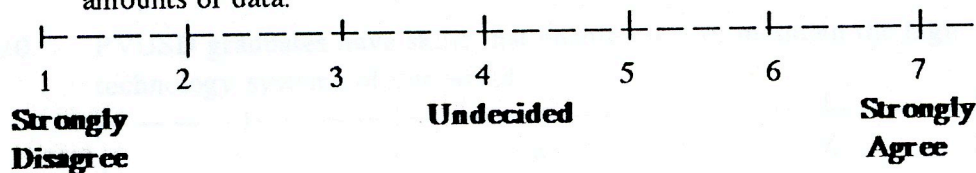
12. Leaders from education and business work actively to establish a partnership using teachers and specialists from industry.



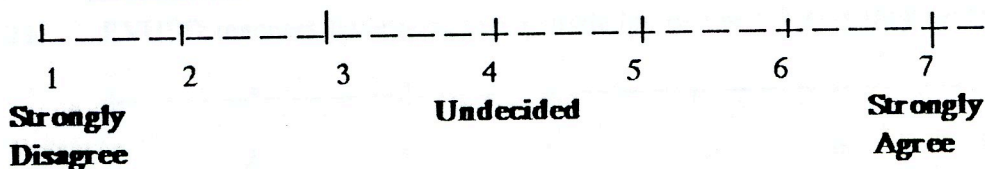
13. PVUSD educators encourage mastery of skills beyond the basics.



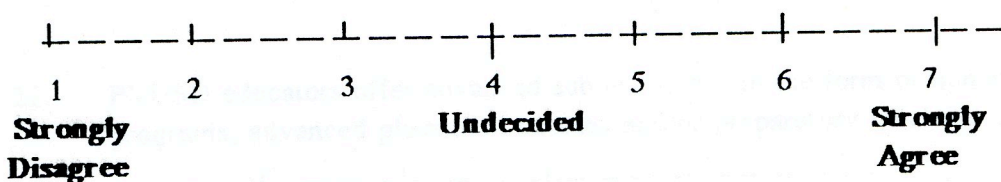
14. PVUSD graduates are able to ask incisive questions based on massive amounts of data.



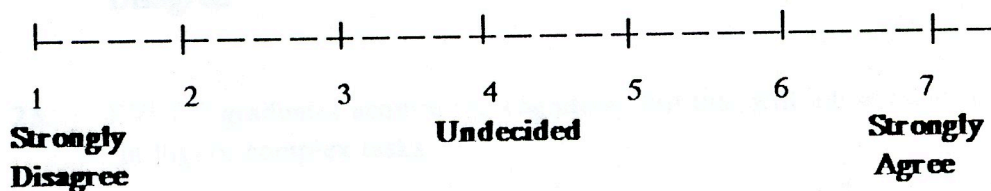
15. PVUSD graduates are challenged to reason, question and integrate information.



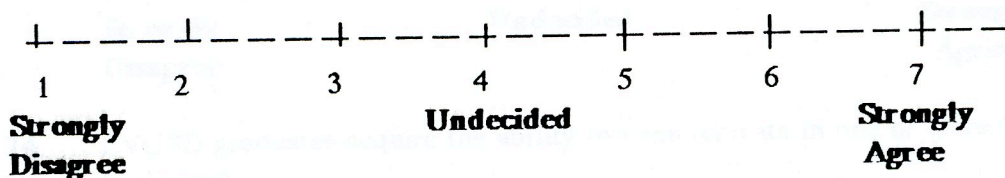
16. PVUSD graduates have the ability to infer various meanings in text.



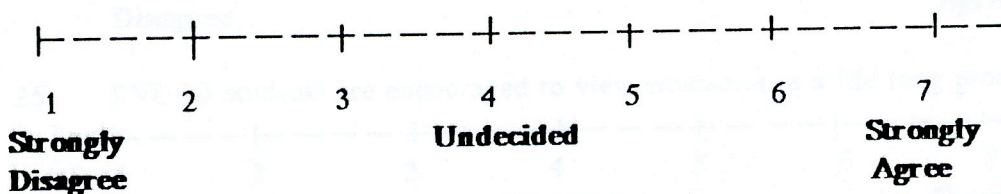
17. PVUSD graduates are allowed to explore a multitude of potential solutions to a particular problem.



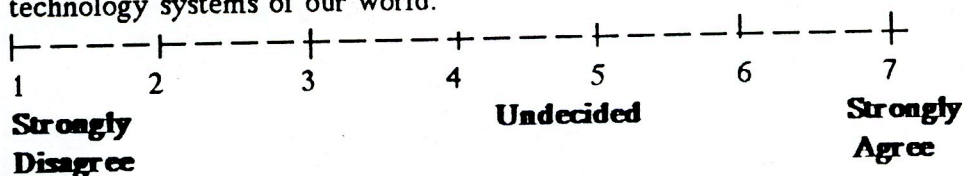
18. PVUSD graduates are equipped with a sound liberal arts education.



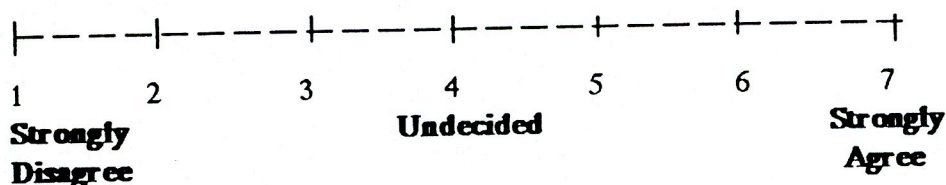
19. PVUSD students are able to communicate increasingly involved messages to both machines and people.



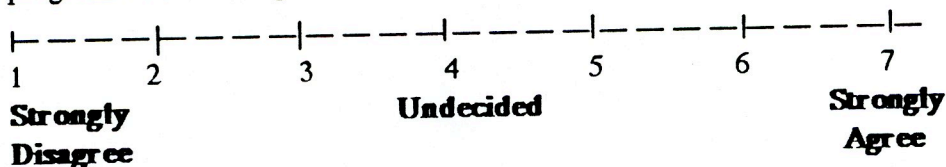
20. PVUSD graduates have skills that enable them to maintain the high - technology systems of our world.



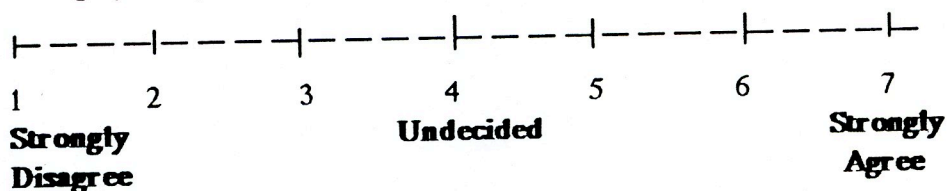
21. PVUSD teachers have adequate knowledge of the subjects they teach.



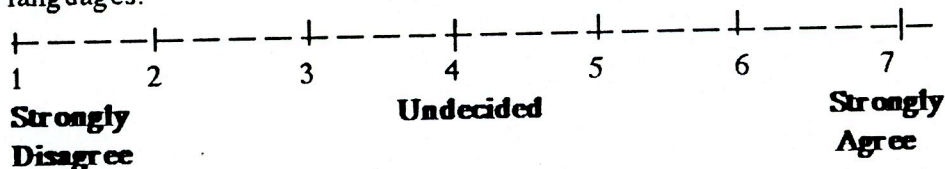
22. PVUSD educators offer advanced subject matter in the form of honors programs, advanced placement courses and/or preparatory curricula.



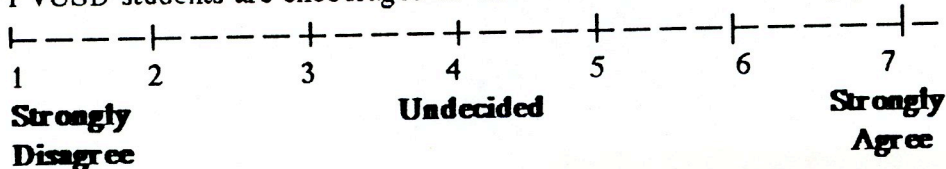
23. PVUSD graduates acquire the cognitive skill that will allow them to engage in highly complex tasks.



24. PVUSD graduates acquire the ability to communicate in one or more foreign languages.



25. PVUSD students are encouraged to view education as a life-long process.



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