Final Project
CET 765
Leadership in Technological Change
Dakota State University
Spring 2007

By
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Final Project – Achievement of Technology Goal using TQM
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Statement of the Technology Goal/Objective:

Use Technology to Improve and Promote Safety, Order, and Reduce Disciplinary Events in the High School: *Technology will be used to promote the safety, orderliness and discipline of our high school.* Educational technologies can provide engaging activity, motivating students of all ages. Since engaged learners are less likely to act out, disciplinary events are likely to decrease. Emerging technologies will be considered for their possible use in maintaining a safe and orderly school.

The past three years have held high incidence rates for crime and disciplinary action on the school campus. We have expelled students due to misconduct several times and hope to decrease expulsions along with misconduct on school grounds. There have been complaints from community members in the vicinity that they feel unsafe living so close to the school.

With the help of new technology, we hope to decrease unpleasant incidents at the school and increase student morale and engagement as well as the perception of the school within the community.

## List of Professional Participants in the Task Force:

Each of the following people was asked to participate in the project. I chose representatives of the school, student body, community, and parents so that both internal and external customers would have an equal say in the process. The community members either own a business situated near the school or live near by, and the parents have student(s) currently enrolled in the district but not necessarily in the high school yet. The school staff members have all served a minimum of two years at the high school and were familiar with past disciplinary issues.

Anne Elisa Hanson – Task Force Leader and School Representative to the Community
Mr. Fisher – School Superintendent
Mrs. Castillo – School Principal
Mrs. Draper – School Guidance counselor
Mr. Brown – School Security Officer
Mrs. Garcia – PTA member and parent of 11th grade student and a 9th grade student
Miss Henderson – 12th grade student
Mr. Miller – Community Business owner
Mr. Jackson – 12th grade student
Mr. Howard – Parent of 6th grade student
Mrs. Sasso – Community member

A Summary of the Plan for Improvement:

In order to improve the overall safety, order and discipline in the school we decided that it would be important to begin by creating a theory or hypothesis as to how we could use technology to reach our goal. We then decided to analyze the current systems, technologies and procedures in place by gathering data on the schools' crime rate, disciplinary rate, overall student morale and motivation, and the community perceptions of the school as a whole. Once this data was analyzed, we would identify weaknesses in the current system, develop possible solutions, implement the solutions deemed most appropriate, study the results of the new system changes and then make modifications if necessary. The individual steps are outlined in Figure 1.

Figure 1- Steps toward Continuous Improvement
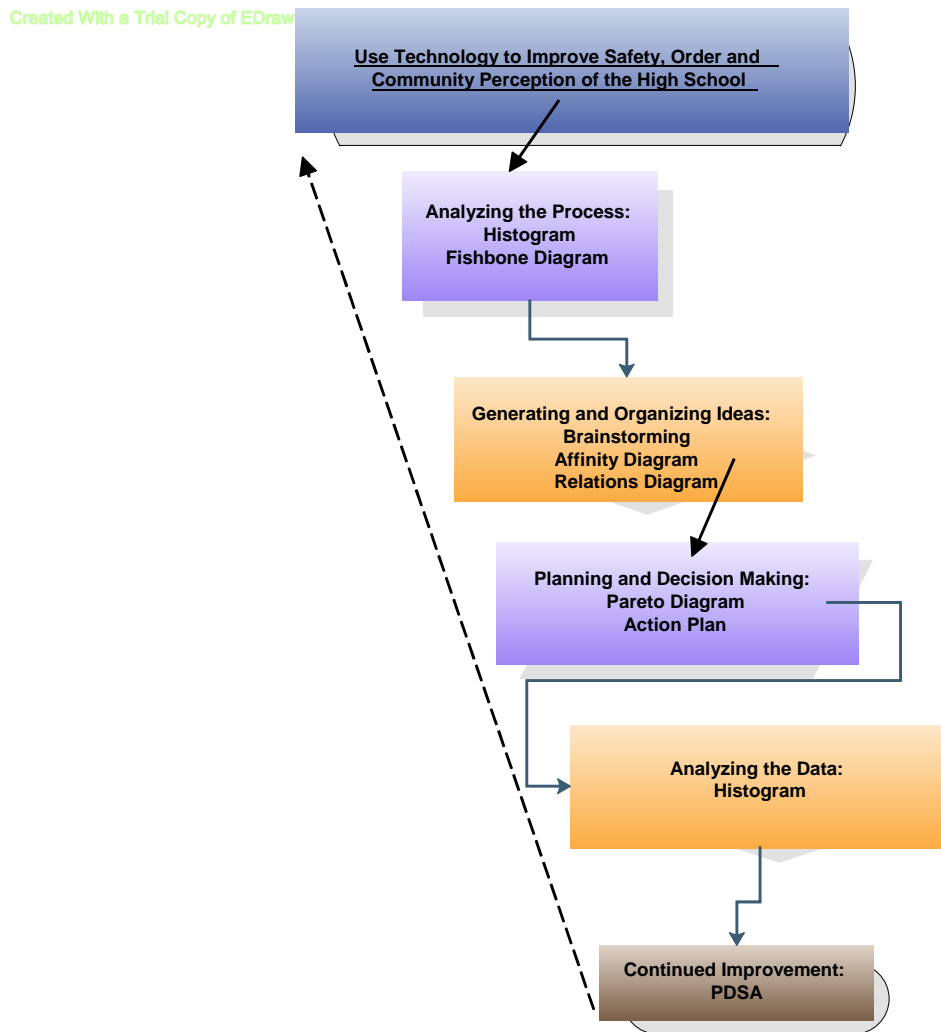
Step 1: Analyzing the Process

The first step of the task force was to decide on the gravity of the issue and then come up with possible ideas or theories. We convened after school in the library and I began the meeting by introducing myself and the rest of the committee. We decided to anonymously rate the severity of the school safety issue on a scale of 1 to 5 with 1= not an issue and 5= serious issue. We each wrote our rating on a piece of paper and handed it to the front. After reading all of the responses out loud, it was unanimously concluded that school safety was indeed a serious issue. The results of the anonymous vote are shown in Figure 2. We all agreed that the issue was one that needed immediate attention so we decided to go ahead and proceed to the next step.

Figure 2- Results of Anonymous Vote
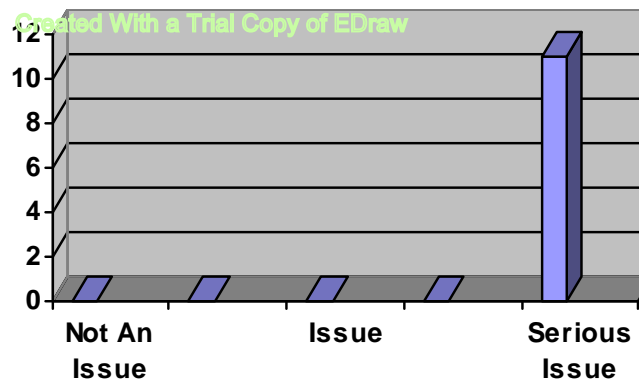
The next thing the committee undertook was to compile and organize data showing the current state of affairs within the school. We gathered data on disciplinary actions taken over the past three years, (2004-2006), complaints of community members during this time, the number of expulsions, the current technologies being used to deter delinquency and violence, and the policies in place that deal with school violence and crime. This data, (compiled with this year's data) is available below in Figures 3-7. The committee discovered that there had been 45 assaults, 58 incidents of vandalism, 99 thefts, and 7 expulsions in the school in the past three years. There had also been a total of 64 complaints by neighbors and business owners in the near proximity of the school. (To view a general layout of the school in relation to the community please see Figure 14.) There was currently on staff only one school security officer, a Mr. Brown, who had been employed by the school for 16 years. There was one camera in the Administration Office, one camera by the front entrance, and one camera in the cafeteria. According to the data, the misconduct took place in the cafeteria, the hallways, the outdoor school grounds and the gymnasium. Of these locations, the only place that had a camera was the cafeteria.

In terms of student morale, we conducted a survey on school spirit by picking a random sample of 100 students per grade and asked them to fill out a short survey about school spirit. The results of the questions were compiled and the subsequent data is shown in Figure 6. As the histogram shows, the majority of students had only moderate school spirit.

Once we analyzed the data, we decided to make a *Cause-and-Effect Diagram*, to help us identify some of the root causes of the problem (Figure 8). The cause-and-effect diagram helped us identify the root causes to the problem. In order to generate the ideas, we went around the group in an orderly fashion and allowed each person to share one idea. If a committee member had no idea to share, they were able to pass to the next member. As the ideas were generated, they were recoded and displayed. After carefully looking over all of the recorded ideas, the team decided to pick one cause from each category to focus on, (these are highlighted in yellow). The root causes that were decided on as primary focuses

for the group were: improper training of school staff and administration, outdated technology, low student morale, and inappropriate consequences for disciplinary actions, (for example: suspension for vandalism, rather than community service.)

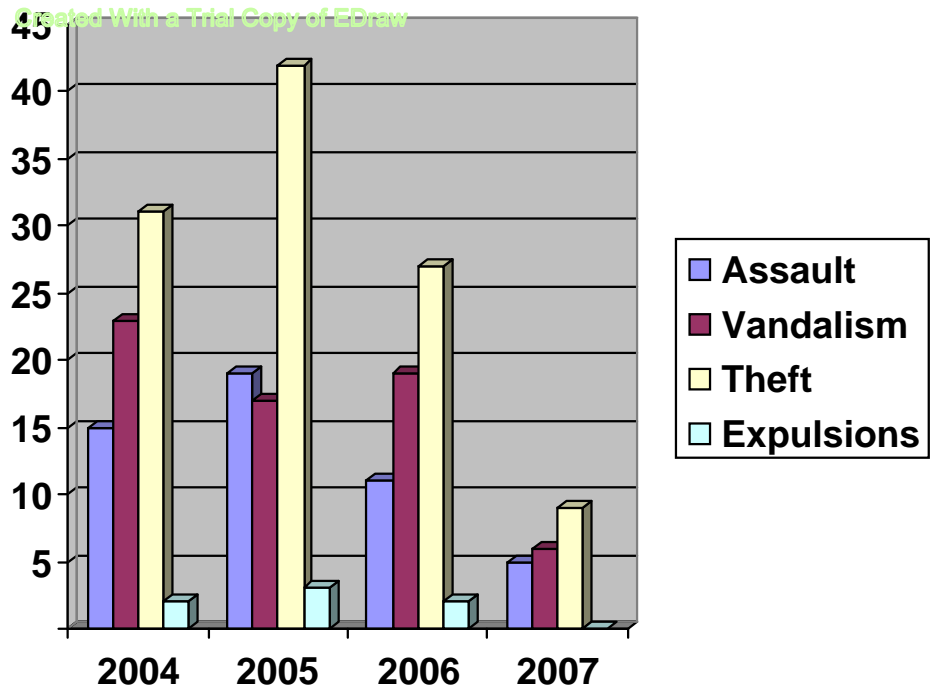**Figure 3 - Frequency of Assault, Vandalism, Theft and Expulsion per School Year**

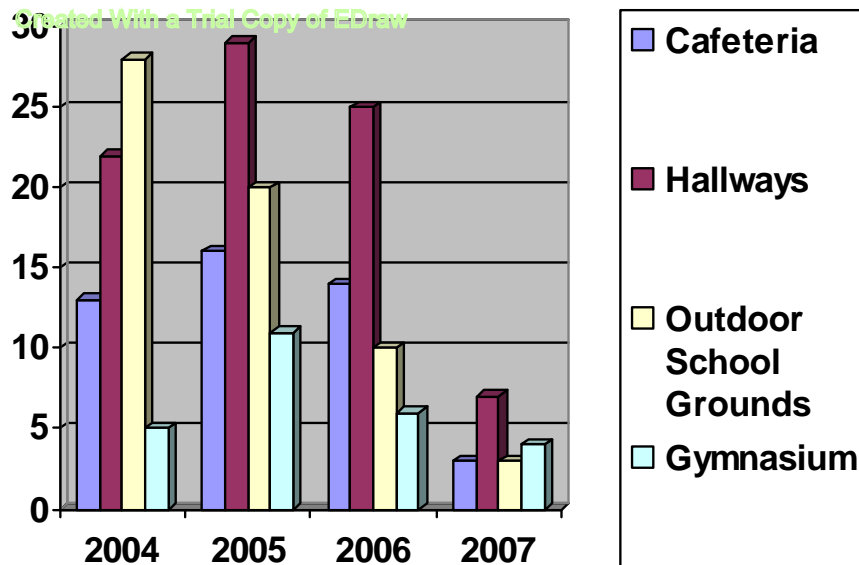**Figure 4 – Locations of Misconduct on School Property by Year**

Figure 5 – Complaints of Student Misconduct by Community Members per School Year 2004 -2007
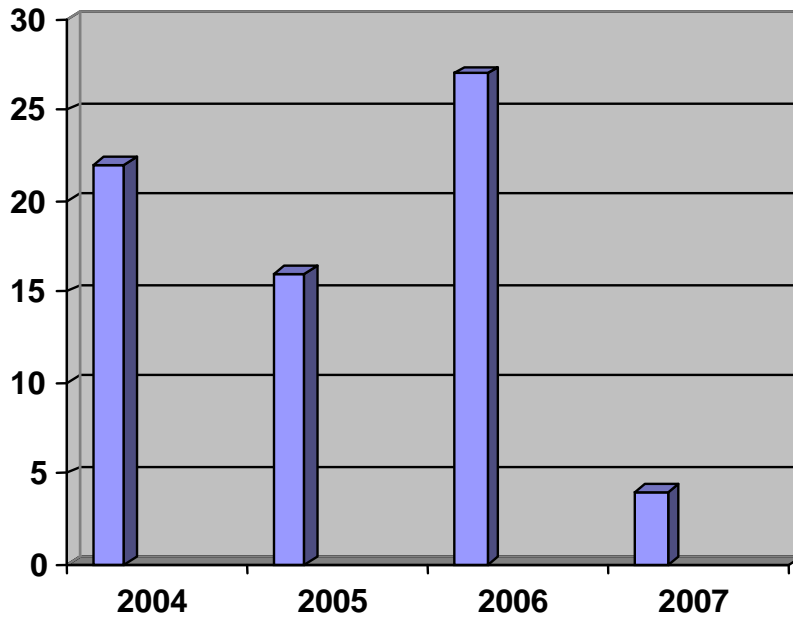
Figure 6 – Results of Survey on School Spirit 2006 (Random Sample of 100 Students per Grade)
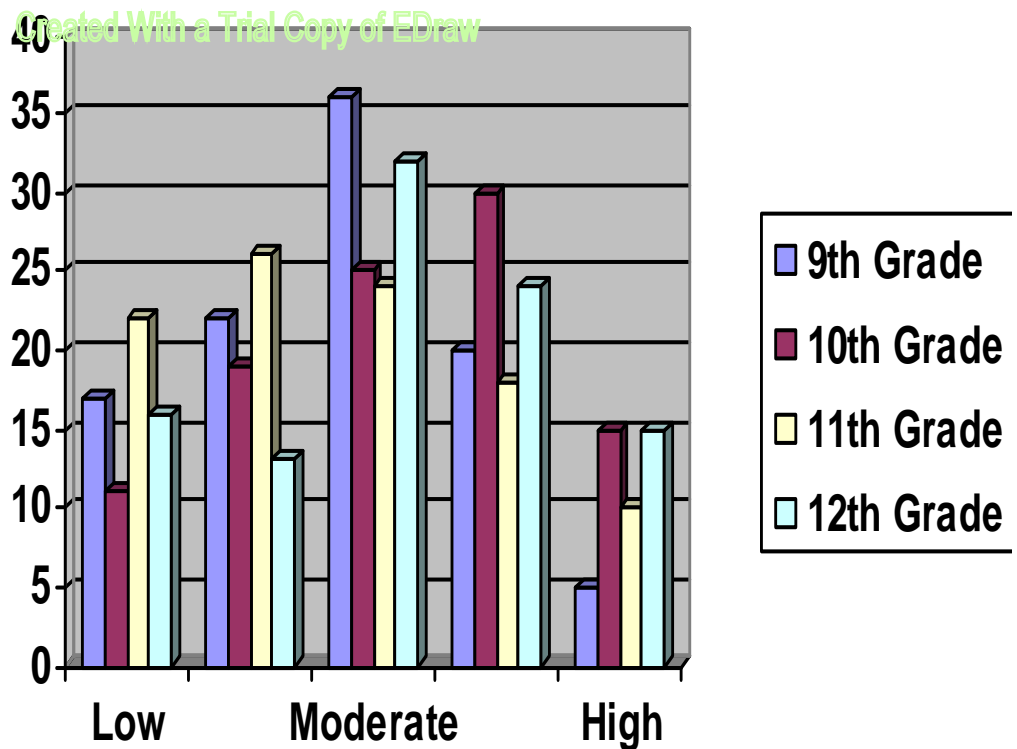
Figure 7- Results of Survey on School Spirit 2007 (Random Sample of 100 Students per Grade)

School Staff & Administration

Inconsistent

Communication Breakdown
Unable to Enforce rules

Not properly Trained
Unaware of how To help

Environ-ment

Unaware of Policies
Peer pressure

Low Morale

Undisciplined At home

Acting out

Low self-Esteem

Poor role Models

Not invested in Community
Not Participating in Constructive Activities

Students

Technology

Outdated

Hard to use
Expensive
Requires Training
Hard to Obtain

Inefficient

Vague & Unclear
Not Communicated To community

Outdated

Not easily Upheld

Consequences Not Appropriate

Old-fashioned

Policies

Improve Safety, Order, & Discipline In The School

Figure 8 - Cause-and-Effect Diagram

Step 2: Generating and Organizing Ideas

After reviewing all of the data that the committee gathered, and the Cause-and-Effect diagram, we had decided on four general areas in which improvement should be made. So, we decided to try and come up with possible solutions for the problem. As suggested by a few of the committee members, *Crawford Slip Brainstorming* was used to generate a large number of possible ideas. Each person was given a s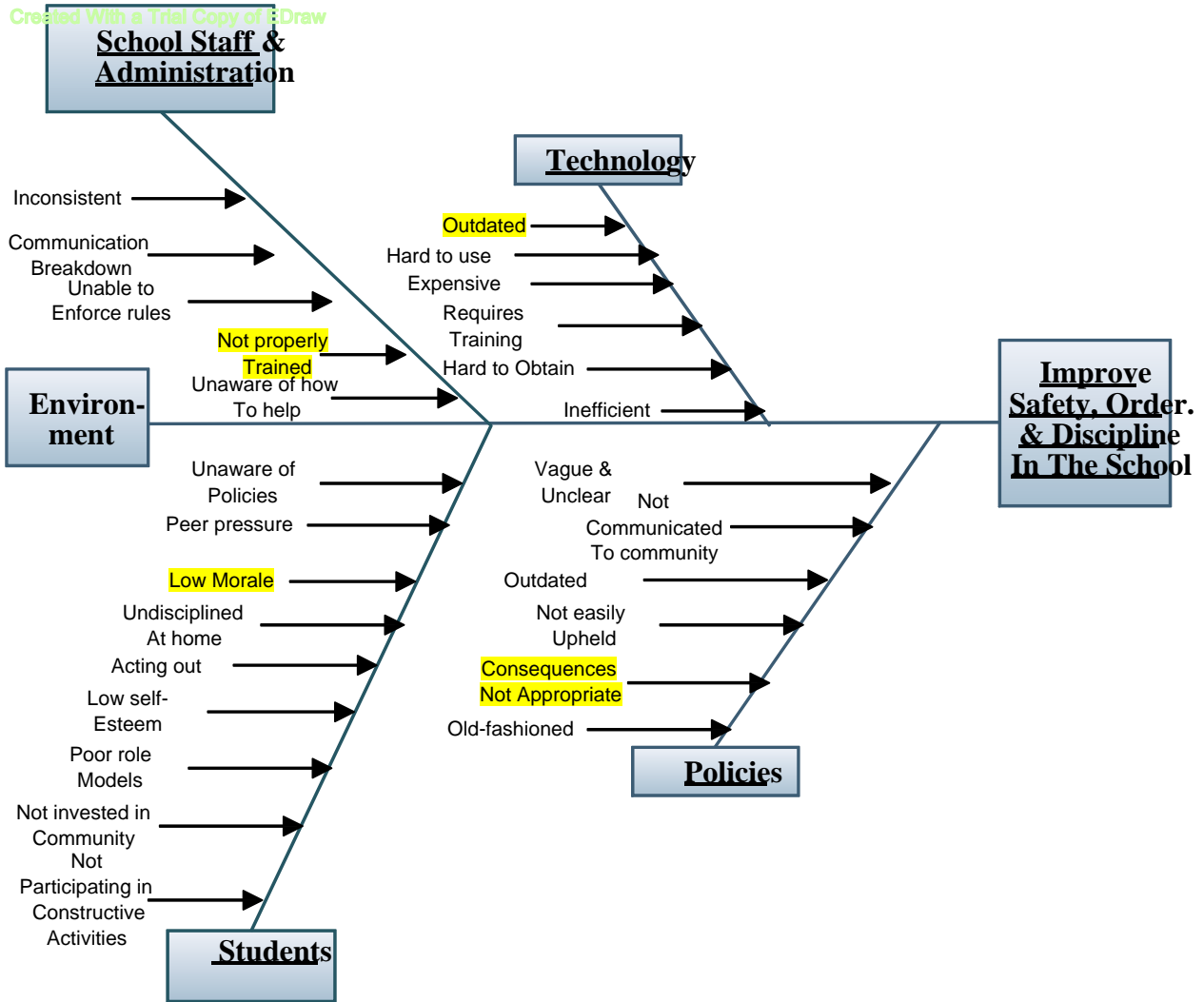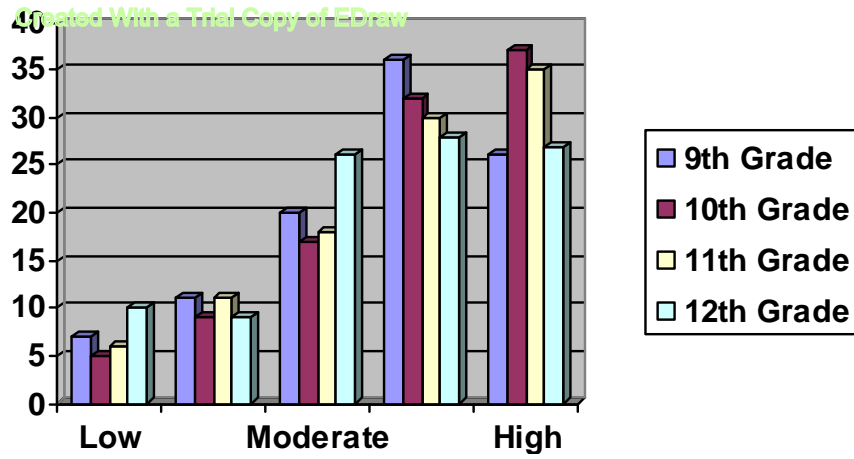mall stack of post-it notes and asked to silently write any ideas they had on the post-its. When everyone was finished writing their ideas down, all of the ideas were placed in the middle of the conference table, repeated ideas were eliminated and the remainder of the ideas were sorted into groups. The ideas were placed into six categories: Technology, Student Motivation, Policies, Community, Administration and Staff Training, and Personnel. At this point, the committee members were not too concerned about budgets because we knew that the community as well as the school district was expecting improvement at whatever cost. When the committee felt that each person had had a fair shot at arranging and re-arranging the ideas in their respective categories, an *Affinity Diagram* representing these groups was drawn on the board so everyone could see (Figure 9). With the help of the *Affinity Diagram*, the group was able to better understand the issues at hand.

The group now had a better understanding of how we should improve the system, but we decided that one further step was necessary. We decided to draw a *Relations Diagram* (Figure 10) in order to examine how each category affects the remaining categories. We wrote the problem statement in the center of the paper and placed each category from our *Affinity Diagram* in a circle around the problem statement. We then analyzed each category to determine if a relationship existed with any of the other categories. When we found that a relationship existed, a line was drawn from the category which was the affect to the category which had been affected. The *Relations Diagram* helped the group visualize just how inter-connected each of the issues is.

The committee decided that with our firm understanding of the issues and how they relate to each other and the general problem at hand, we were ready to decide on our course of action.

Figure 9: Affinity Diagram of Brainstorming Results
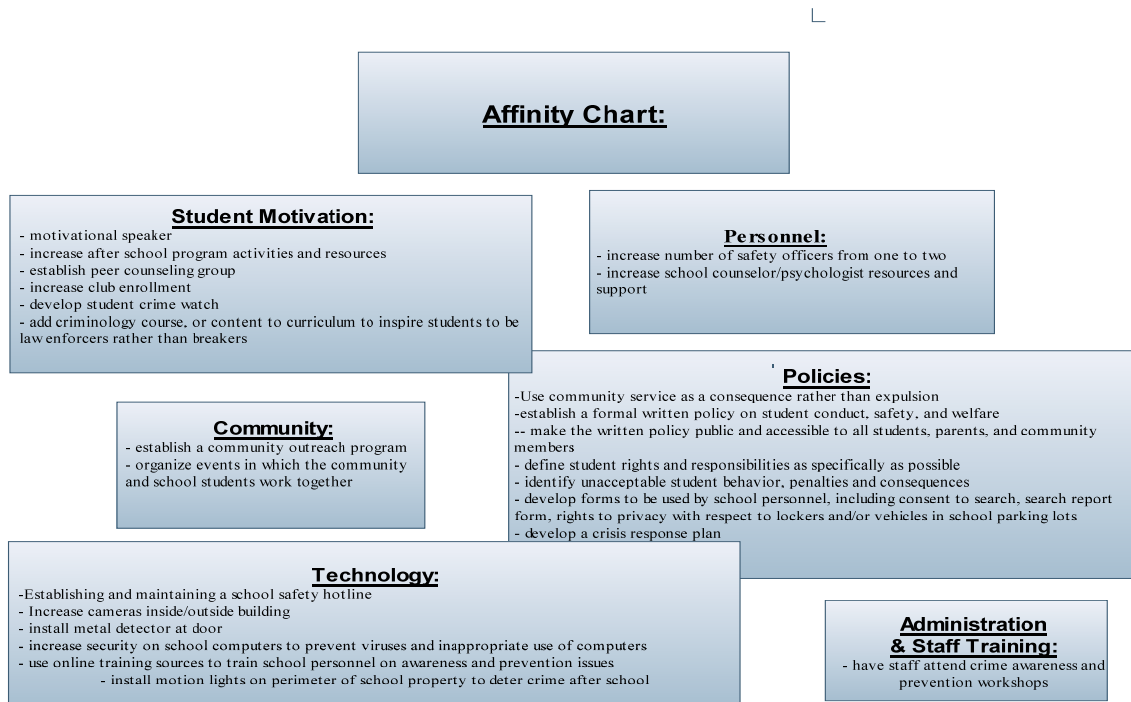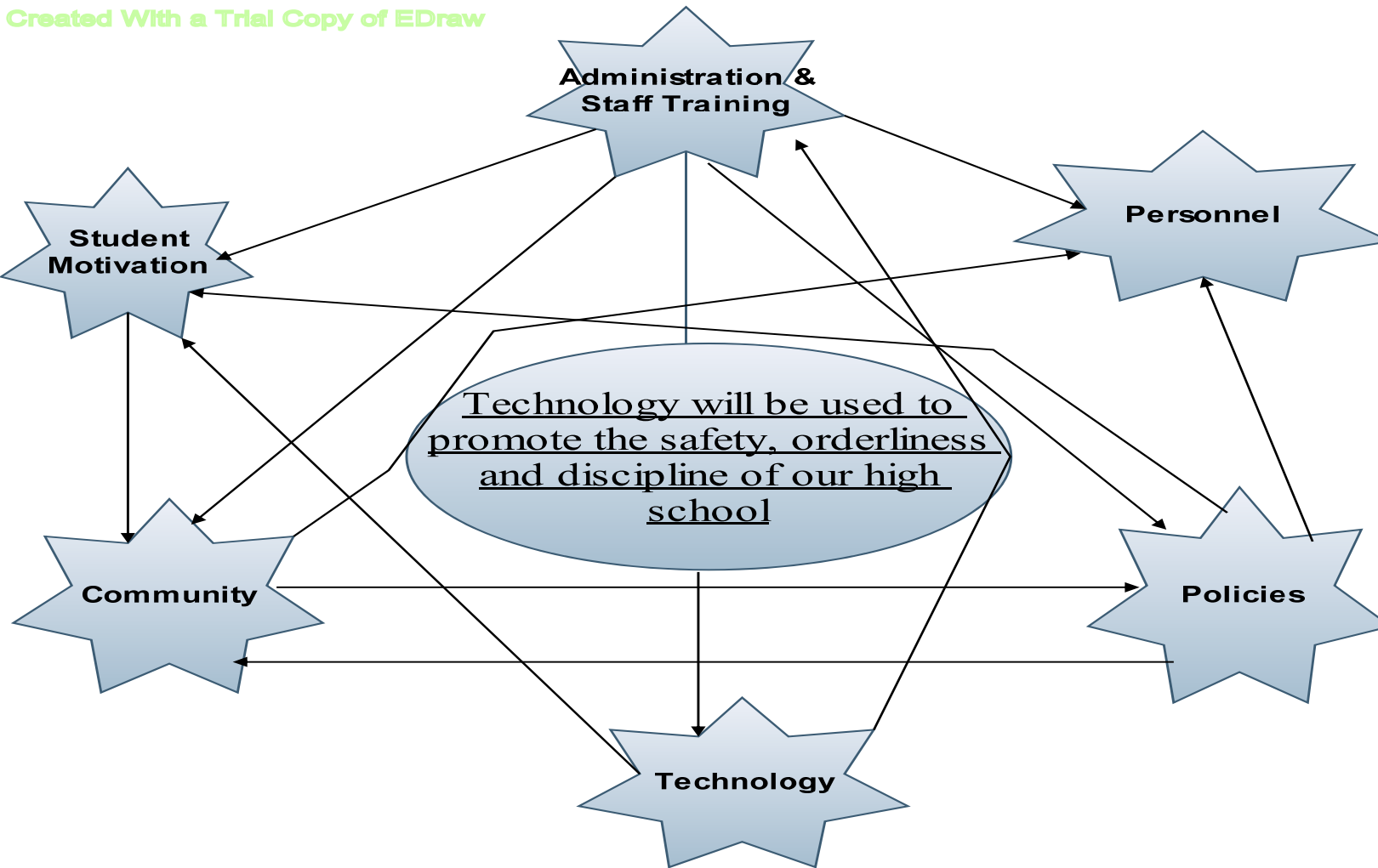
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Affinity Chart:

Student Motivation:
- motivational speaker
- increase after school program activities and resources
- establish peer counseling group
- increase club enrollment
- develop student crime watch
- add criminology course, or content to curriculum to inspire students to be law enforcers rather than breakers

Personnel:
- increase number of safety officers from one to two
- increase school counselor/psychologist resources and support

Community:
- establish a community outreach program
- organize events in which the community and school students work together

Policies:
-Use community service as a consequence rather than expulsion
-establish a formal written policy on student conduct, safety, and welfare
-- make the written policy public and accessible to all students, parents, and community members
- define student rights and responsibilities as specifically as possible
- identify unacceptable student behavior, penalties and consequences
- develop forms to be used by school personnel, including consent to search, search report form, rights to privacy with respect to lockers and/or vehicles in school parking lots
- develop a crisis response plan

Technology:
-Establishing and maintaining a school safety hotline
- Increase cameras inside/outside building
- install metal detector at door
- increase security on school computers to prevent viruses and inappropriate use of computers
- use online training sources to train school personnel on awareness and prevention issues
    - install motion lights on perimeter of school property to deter crime after school

Administration & Staff Training:
- have staff attend crime awareness and prevention workshops

Figure 10: Relations Diagram

Administration & Staff Training

Personnel

Student Motivation

Technology will be used to promote the safety, orderliness and discipline of our high school
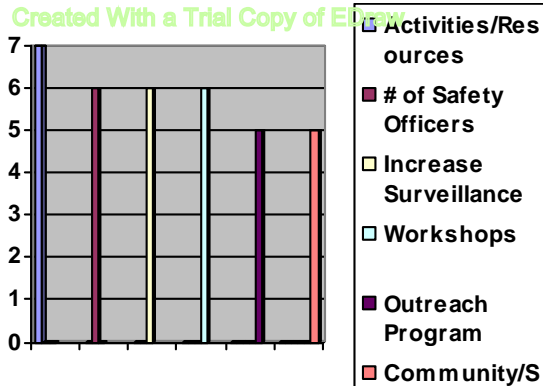
Community

Policies

Technology

Step 3: Planning & Decision Making:

Based on the information the committee had, we decided to use the suggestion that were made during the *Crawford Slip Brainstorming Activity* and were now part of our *Affinity Chart* as our possible solutions. We needed a way to narrow down the possible solutions. It was decided that a *Pareto Diagram* (Figure 11), would be the most efficient and fair way to decide on our course of action. Before we could make the *Pareto Diagram,* some *Light Voting* needed to take place. Light voting is the process that allows every member of the group an equal chance to control the groups' decisions. Each member of the committee was asked to prioritize the possible choices by assigning the highest number to their highest priority. For our purposes, we used a different scale for each category because there were different amounts of choices for each category. For example, in the Policies category, a scale of 1-7 was used with 7 being the highest value and 1 being the lowest value. We voted on each category and then the results for each category were tabulated in front of the group. We then summarized the results and

made the *Pareto Diagram* with the results of each member's list. The items with the highest numbers would be the items implemented into our new plan. The results of the *Pareto Diagram* indicated that the following ideas were the highest ranked: increasing after school activities and resources, establishing a community outreach program, increasing cameras inside and outside of the building, increasing the number of safety officers, the use of community service as a disciplinary consequence rather that suspension, and awareness and prevention workshops for the administration and staff. We now decided to draw up an *Action Plan* (Figure 12) so that the details of how each solution would be implemented would be clear for everyone.

Figure 11: Pareto Diagram

Action Plan

What	How	Who	When
Increasing After School Activities and Resources	Have students form new clubs, add computers, sports equip.,etc.	Student leaders and staff not currently in charge of an extra-curricular activity	By next month
Increasing the Number of Safety Officers	Hire one more safety officer	School Board	By next week
Establishing A Community Outreach Program	Hold a meeting with community members and student leaders and organize an outreach program that both will participate in and facilitate	Community members and student leaders	By next month
Awareness and Prevention Workshops for the Administration and Staff	Research and locate pertinent and up-to-date workshops and seminars for administration and staff to attend	School Principal/Superintendent	By next month
Increasing Cameras Inside and Outside the Building	Hire security firm to update or replace existing technology including cameras on the inside and outside of the school building	Superintendent	By next week

	and property		
Community Service as Consequence	Update current disciplinary policies by adding more appropriate/constructive disciplinary measures such as community service	Superintendent, School Principle, School Guidance Counselor, School Board	By beginning of next quarter

Figure 12: Action Plan

Step 4: Analyzing the Data:

Once the group developed the *Action Plan*, we were ready to go! Each member of the committee that had been assigned a specific duty carried it out, and the process was under way! There was a lot of excitement at the high school as changes were being made. Some changes were relatively easy to implement, such as the hiring of a new security officer and updating the school surveillance system, while others were a little more complicated. The committee found that it was a little difficult to get teachers to volunteer their time to run after school activities, but once they understood that it was for the good of the school and community, they acquiesced and ended up being quite enthusiastic. The community outreach program has been a great success and has really helped join the community to the students. We have reportedly increased the school's perception in the community by a several percentage points.

Figures 3, 4, 5 and 7 all show updated data showing the school's improvement. Disciplinary action decreased by about 50%, misconduct in all four of the problem locations on school grounds decreased greatly, school spirit has increased, and in 2007, there were only four complaints by community members as opposed to 26 in the year 2006.

By in large, we are very pleased with the results of the committee's work and feel that our efforts have improved the safety, order and occurrence of disciplinary action in the high school. Of course, as in all systems, improvement is constantly happening. We will continue to gather data and meet again at the beginning of next year in order to start the process all over again and continue improving our school.

A diagram of the PDSA (Plan-Do-Study-Act) is pictured below in diagram 13. This model depicts how continuous improvement works in a system.
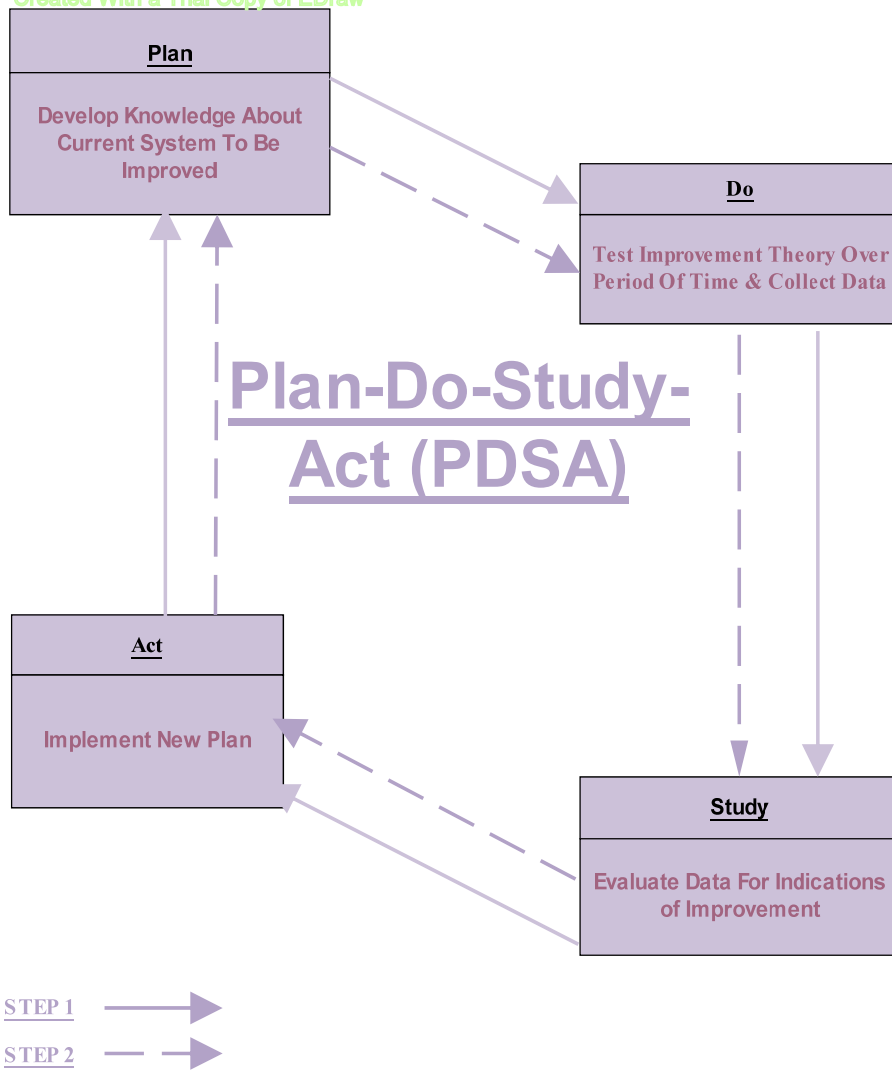
Plan

Develop Knowledge About Current System To Be Improved

Do

Test Improvement Theory Over Period Of Time & Collect Data

Plan-Do-Study-Act (PDSA)

Act

Implement New Plan

Study

Evaluate Data For Indications of Improvement

STEP 1 →

STEP 2 - - →

Figure 13- PDSA Model

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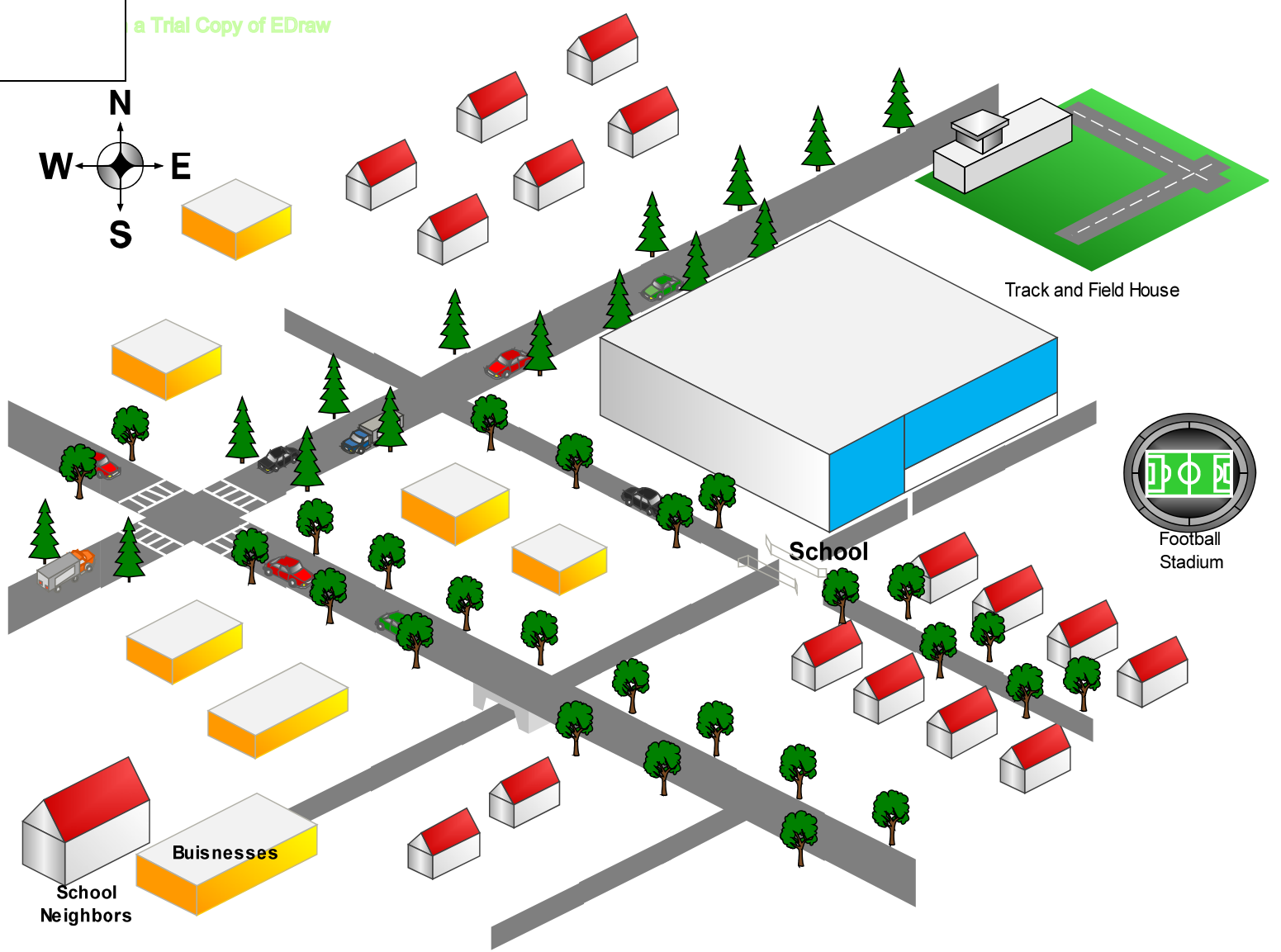Track and Field House

School

Football
Stadium

Buisnesses

School
Neighbors

Figure 14 - Vicinity of Neighbors and Businesses to School