

Virtue and Engineering Ethics - A Pilot Study

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Abstract

How to teach a student to be a technical engineer, regardless of discipline, is well known, understood, and vetted; however, the same does not hold true for teaching students to be ethical engineers. New approaches to teaching engineering ethics range from limited at best to nonexistent in most cases. This paper builds upon prior research with a pilot study to test the potential of implementing a new approach to teaching engineering ethics. A pilot study was conducted where student volunteers were exposed to a program of virtue education, journal exercises, and reminder techniques to generate a greater awareness of virtue in their daily lives. The intent of the study was to enhance the student's awareness of virtue and to translate this exposure so that the student is more effective in understanding engineering ethics without specifically relying on a professional code as a mechanism for ethical behavior. The results of the study indicate that the approach positively influenced the students' awareness of virtue and how virtue as a mechanism for ethical behavior is effective. There are also indications that "perceiving" the need for ethical decision making was increased. Students benefited from the exercise and indicated that they understood that virtue is an effective driver for ethical behavior.

Background

The engineering profession holds tremendous value in American society and plays a fundamental role in assisting in the efficient functioning of our society. Indeed, the practice of engineering does not exist outside the domain of societal interests [1]. When dealing strictly with societal interests, it is important as an engineer to act in good faith and provide the very best of one's capabilities. Good engineering ethics is an important component to the professional careers of engineers; however, the focus of our engineering education does not provide the necessary exposure to engineering ethics education as it should. "An engineer's conduct (as captured in professional codes of conduct) toward other engineers, toward employers, toward clients, and toward the public is an essential part of the life of a professional engineer, yet the education process and professional societies pay inadequate attention to this area." [1] Truly, developing ethical engineers goes beyond classical pedagogical approaches. Certainly, to develop an engineer's desire to practice good engineering ethics requires an approach that improves character. The concept of character education to develop ethical engineers might seem farfetched and beyond what an engineering department should do; however, it is the most effective way to "change" an individual into someone with good character capable of making the right ethical decisions when codes cannot provide the answer to tough ethical challenges. It is through character education that ethical decision making becomes internalized and part of the engineer's natural thought process.

So why should we focus on virtue to create ethical engineers? It is clear, through the research, that members of the various professions, to include engineers, are not being adequately prepared to handle the ethical challenges of their practice [2] [3]. In the fields of medicine, law, and teaching, pre- and in-service educational programs spend very little time on character or virtue-based education [4] [5] [6] [7]. A quick search of the internet can produce sites that provide engineering ethics professional development courses. These classes are based on engineering ethical codes and teach about the specific engineering code structure and content. The classes serve the purpose of exposing engineers to the engineering

ethical codes but they are unable to adequately provide the necessary knowledge to apply the codes ethically. There are several problems at the college and professional level with an overall focus on codes. First, codes are abstract, and professionals must use their judgement to assess and make decisions not necessarily covered by a code [8]. Second, there is the possibility that codes will place an obstruction between personal professional conduct and personal values, beliefs, truth, conscience, etc... which challenge a person's integrity [9]. Finally, written codes are fundamentally disciplinary by nature and are not inspirational edicts to guide a professional to achieve good ethical decisions [10]. Character education is an alternative approach to these challenges endemic to current ethical code education. Character education through virtue provides a more effective method to inspire engineers and will assist them in making better ethical decisions in the complex challenges of the profession.

There are numerous character education approaches that have resulted in varying degrees of success. Most of these approaches are based at the primary school level in classroom settings. Teaching character through curriculum subjects, teaching virtue through literature, role playing, formal classes in virtue, moral-dilemma tests, and others are examples of solid research with positive results at the primary school level [11] [12] [13] [14] [15] [16]. This type of research is partly a result of governmental involvement to address perceived character development deficiencies in young children at the primary school level. The results of these efforts have produced numerous pedagogical approaches [14]. For the purposes of this study, focus was on college level approaches to character education.

Much of the character education at the college level has been a response to a call from policy makers for renewed focus on character [14]. For the most part, the response has been on the periphery of college life where volunteer service centers, community activities, and other similar type constructs are intended to draw in student participation and provide the environment and experience necessary to develop student character for the good through participation [17]. There are exceptions to this passive approach. One of these exceptions is at Wake Forest University where character is an integral part of student development through their Program for Leadership and Character [18]. The Program has developed campus partnerships, student programming, academic courses and pursues research in leadership and character [18]. For the purposes of the paper, it is interesting to note that the Program has also established a relationship with the Department of Engineering to "...infuse character throughout its four-year curriculum [18]."

West Point

Another pertinent example is the character education program at the United States Military Academy (USMA) at West Point. The USMA was established in 1802 as a military academy to produce engineers/officers for the US Army [19]. The character of the cadet became a key component of the overall education system of USMA. Initially, the character program was not codified per se but it was identified as an important and essential part of the mission of USMA [19]. As USMA evolved over its 200+ year history, so has the character program. It has become an integrated program intended to develop the character of all cadets into moral and ethical Army officers. Indeed, USMA identifies itself as the "preeminent leadership development institution" and promotes its graduates as "leaders of character" [20].

With all its efforts to develop and improve cadet character, USMA continues to see challenges in poor cadet conduct which indicate that the current system of character development falls short of the mark. Continued incidents of cheating, sexual

assault/harassment, and drug use challenge USMA in its quest to change the character of cadets for the good.

Pilot Study

A pilot study was conducted at the United States Military Academy to assess a cadet's ability to observe/perceive virtuous acts in everyday life. The intent of the study is to see if using an innocuous exercise aimed at creating greater awareness of virtue could have a positive impact on the cadet's character and provide the cadets a mechanism for enhancing their ethical behavior. This pilot study looked at perceiving virtuous acts in everyday life. Perceiving virtue through this exercise is a way to reinforce concepts learned in the classroom. The study investigates whether cadets are positively affected after a formal class on virtue followed up with an exercise involving observing and recording acts of virtue. Though minor in construct, this pilot study does provide insight toward potential pedagogical approaches to engineering ethics education. The study was conducted, data gathered and analyzed over a two-week period.

This pilot study attempts to evaluate an engagement exercise intended to reinforce certain classroom concepts to include observation, virtue, and perception. A part of this pilot included virtue class instruction to assist cadets in a greater understanding of virtue. Following the class, cadets went through a weeklong exercise of passive observation. The pilot study will assess if cadets, who are given virtue instruction and conduct an observation exercise with reflection, are better able to perceive virtue in everyday life. By increasing their virtue awareness, the researcher hypothesizes they would increase their overall understanding of virtue. If their understanding is improved, they will be better able to internalize virtue and by default, improve their character and enable them to make better ethical decisions.

Pilot Study Design

A quasi-experimental approach was adopted with control and experimental groups using a pre-test survey as a baseline and a post-test survey to measure differences in statement responses. The survey consisted of fifteen statements about virtue and character (see below) and was given before any virtue instruction. The statements were on a five-point Likert scale to allow cadets to express how much they agreed or disagreed with each statement (Strongly Disagree, Disagree, Neither Agree or Disagree, Agree, Strongly Agree).

Participants

The researcher sent emails to sophomore, junior, and senior cadets seeking volunteers for this study. Ultimately, 17 cadets volunteered. They were broken down into an experimental group (12 cadets) and a control group (5 cadets). A comment on the differences of the groups is warranted. Part of the selection process was to offer different orientation dates. Cadets selected their orientation date based on their schedules. It so happened that twelve cadets chose the experimental group time, and five cadets selected the control group time. There are two limitations associated with group numbers. First, the numbers of each group are very low. Second, the differences in the group sizes of 12 vs 5 is problematic. After the group numbers were set based on the original pilot study construct, the researcher decided to keep the numbers as they fell out with full knowledge of the group number limitation. Since this is a pilot study, the group number limitation was noted, and the study went forward as planned. The groups were not aware of the participation of the other group. It was emphasized during the meetings that the participants were to keep their work to themselves but if they wanted to

talk to other cadets they could do so. The study was not a double-blind study and cadets had the ability to discuss what they were doing with anyone they wanted. The participants were spread throughout USMA (no one was in the same company – a company is organizational unit within the military structure of West Point) and were not taking any classes together. There is confidence that the cadets did not discuss the exercise with each other; however, this was not verified. Even if cadets did discuss the study, the effect on the results would be minimal. After completing the study, the researcher asked each cadet if they discussed the study with anyone else. All cadets mentioned they talked about it but did not discuss the study with anyone else in the study.

Methodology

A pre and post survey method was selected [21] to determine if classroom virtue instruction combined with a reminder technique would enhance cadet ability to perceive virtue in daily passive observations. The researcher hypothesized that the ability to perceive virtue will enhance cadet virtue awareness and result in positive cadet character development.

Independent Variables: virtue education class; references; logbook; reminder technique [22]

Dependent Variables: pre- and post- survey; observation numbers made by cadets [22]

Control Group

The control group received the pre-survey and received general instructions on the purpose of the study and observation exercise. The researcher asked the cadets if they understood virtue and to explain it. The cadets were encouraged to ask questions which were then answered by the researcher. The cadets were briefed on the observation exercise. This exercise required them to log virtuous acts they observed during their everyday activities. This passive exercise did not require any type of interaction on the part of the cadet. Cadets received a start and end date for the observation exercise. The researcher answered all questions from the cadets. After the five-day observation exercise, a post survey was filled out and after-action review (AAR) questions were answered. The format of the AAR questions was free form and allowed cadets to write what they felt and provide feedback on how to improve the study (see AAR Questions section). An AAR is conducted after events with the purpose of improving future exercises.

The following objectives were achieved:

1. Conduct a character/virtue pre-survey.
2. Conduct initial meeting and gauge level of virtue understanding. Answer any questions.
3. Conduct a passive 5-day exercise (Monday-Friday) on virtue observations and log the number of encounters each day.
4. Conduct post-survey and answer AAR questions. [22]

Experimental Group

The experimental group received the pre-survey. They received five “virtue” articles to read before beginning the observation exercise and received a logbook to log virtue observations. A virtue class was provided which lasted approximately 45-60 minutes and cadets were provided an opportunity to ask any questions. Cadets were required to develop a reminder technique that was to be used during the observation exercise. The reminder technique was

required so that the cadets would receive a daily reminder to observe virtue. Afterward, the cadets were briefed on the observation exercise. This exercise required them to log virtuous acts they encountered during their everyday activities. This passive exercise did not require any type of interaction on the part of the cadet. Cadets received a start and end date for the observation exercise. The researcher answered all questions the cadets had. After the five-day observation exercise, a post survey was completed and AAR questions were answered. The format of the AAR questions was free form and allowed cadets to write what they felt and provide feedback on how to improve the study (see AAR Questions section).

The following objectives were achieved:

1. Conduct a character/virtue pre-survey.
2. Conduct initial meeting and provide a virtue class to refresh and assist cadets with a standard baseline of virtue understanding. Answer any questions.
3. Provide relevant reading(s) to educate cadets on virtue. Cadets will read the articles before beginning the exercise and provide three questions or comments about the articles.
4. Develop a daily “reminder tool/technique” to remind themselves to observe virtuous acts.
5. Conduct a passive 5-day exercise (Monday-Friday) on virtue observations and log the number of encounters each day. Cadets were given logbooks to log their observations.
6. Conduct post-survey and answer AAR questions. [22]

Instrumentation

Survey

The control and experimental groups took the same survey before and after the observation period. The survey consisted of 15 statements and used a five-point Likert scale (Strongly Disagree; Disagree; Neither Agree nor Disagree; Agree; Strongly Agree). The questions were:

1. I often think of character.
2. Character is important to me.
3. I often think of virtue.
4. Virtue is important to me.
5. It is important to improve my character.
6. Virtue is tied to character.
7. I have tried to improve my character daily.
8. It is important to be able to perceive good character in action.
9. I am comfortable in my ability to perceive good character in others.
10. It is important to be able to perceive virtue in action.
11. I am comfortable in my ability to perceive virtue in others.
12. Using a tool or technique to remind me about virtue and character is important to me.
13. My ability to perceive good character is enhanced through character education.
14. My ability to perceive virtue is enhanced through virtue education.
15. A good leader has virtue and good character. [22]

Upon completion of the surveys, the answers were quantified (a. Strongly Disagree = 1; b. Disagree = 2; c. Neither Agree nor Disagree = 3, d. Agree = 4, e. Strongly Agree = 5). The overall scores for each question were summed and averaged.

Observations

Observations included any virtuous act cadets saw as they went about their daily activities. They would log these acts and maintain a running total of their observations. Although not a requirement for the exercise, cadets could list the specific acts they witnessed. Cadets were allowed to contact the researcher to clarify what they saw and if it qualified as a virtuous act.

AAR Questions

AAR questions were required after the observation period ended. These were open ended questions intended to improve any future studies of a similar nature. Cadets were not required to provide detailed explanations of their answers.

1. How did the study impact you concerning virtue?
2. How did the study impact you concerning character?
3. Did the reminder tool or technique you developed help you at all?
4. How would you improve the use of tools to help?
5. Have you changed in anyway how you view virtue development because of this study?
6. Have you changed in anyway how you view character development because of this study?
7. What could have been done better in the study?
8. What did you like most about the study?
9. What did you like least about the study?
10. Do you think the study could be expanded and used to help cadets better understand virtue and character?
11. Please provide any comments you wish to share. [22]

Data Collection

The pre-/post- surveys were completed in hard copy form. The surveys were anonymous. The data from the surveys and observations were downloaded into an Excel file and consolidated by group. The AAR questions were compiled and placed into the Excel file.

Analysis

Due to the small populations, analysis of the data is limited to descriptive statistics. However, there were general comparisons based on statement responses averages as well as standard deviation and coefficient of variation. Free form answers to the AAR questions were used to draw general inferences and common trends. [22]

Findings

The pre/post survey statement averages for the control group are depicted in Figure 1. The statement response average is on the “y” axis and the corresponding statements are on the “x” axis. This graph illustrates what one might expect – an upward trend in statement answer averages. It would seem a natural result of cadets being more aware of virtue after five days of logging observations. Statement 4 (Virtue is important to me.) shows slight downturn from pre to post survey which is due to one cadet changing his score from neither agreeing nor disagreeing to strongly disagree. Statement 7 (I have tried to improve my character daily.) indicates small variation in the results with one cadet indicating they strongly agree to trying

to improve their character daily to neither agreeing nor disagreeing to that statement in the post survey. Since there were only five cadets in the control group, the adjustments to statement 5 and 7 were due to one cadet changing their view. However, since the surveys were anonymous it is difficult find the reason for this outlier.

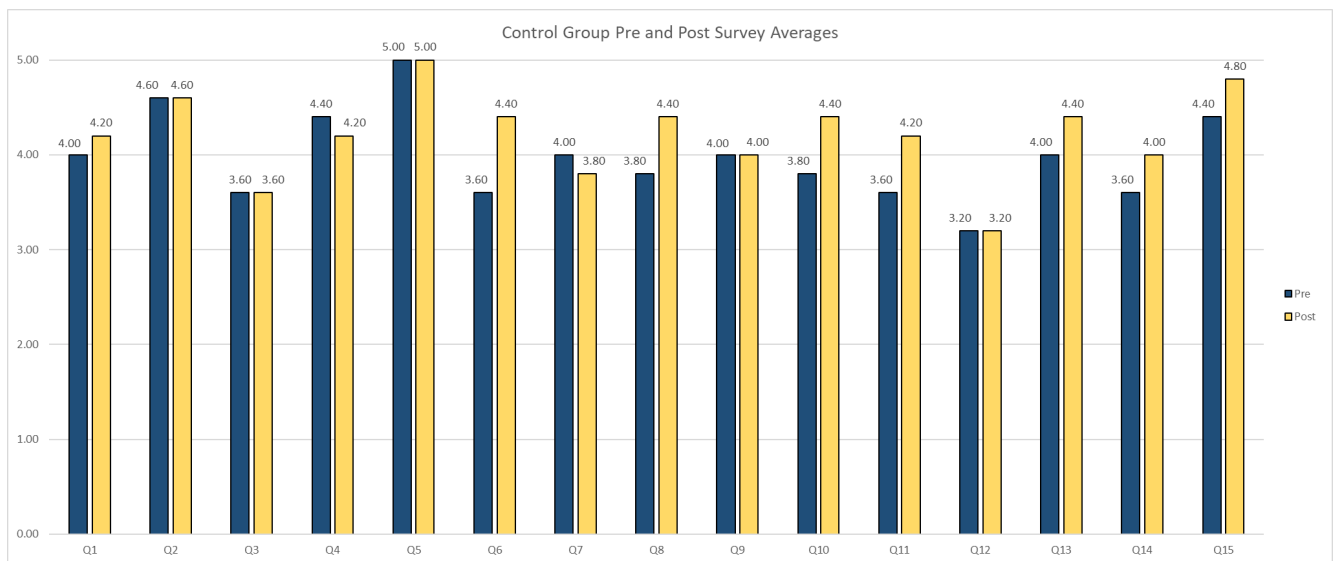


Figure 1: Control Group Pre and Post Survey Averages [22]

The experimental group averages for the pre/post surveys are depicted in Figure 2. Like the control group, the experimental group graph depicts an uptick in positive scoring; however, the uptick is much stronger. In statement 9 (I am conformable in my ability to perceive good character in others.) there is a small downward tick of .09. However, this is not large enough to indicate a major shift in thinking by the group. The remaining averages indicate a very strong upward movement after the virtue class and the five-days of observation.

Comparing the averages for the pre-survey for the control and experimental groups, they are at about the same point for each question. This would be expected since both groups were selected from the cadet general population and took the survey prior to starting the study (Figure 3). It is noted that the experimental group is higher on seven statements, and the control group has a slightly higher average on eight of the statements. Likewise, the average of all the pre-survey statements of both groups is exactly 3.97. This gives the study confidence that both groups are at the same start point. This allows greater confidence that the post survey results may indicate an association with the independent variables.

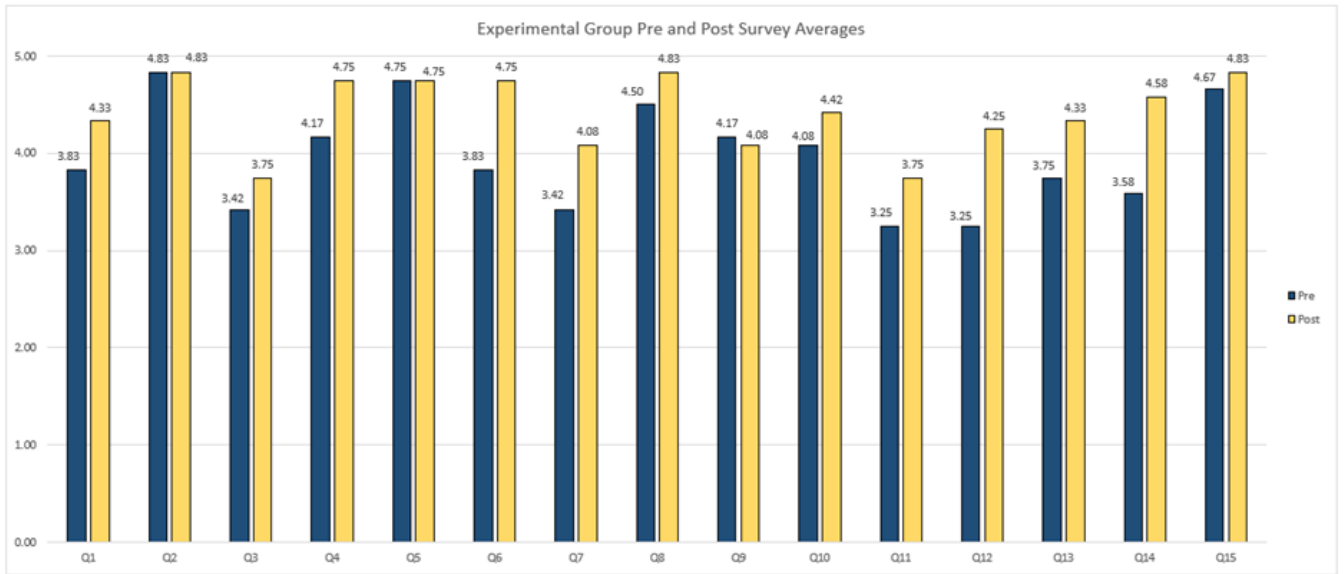


Figure 2: Experimental Group Pre and Post Survey Averages [22]

Comparing the post-survey groups averages there is a noticeable difference in each group with the experimental group generally scoring higher than the control group (Figure 4). The overall control group average is 4.21 and the overall experimental group average is 4.42. The .21 difference does indicate that something happened between the groups from when the pre-survey was given to the post survey. There are three responses in the experimental group averages that are lower (#5, #11 and #13). These are reviewed in the discussion section.

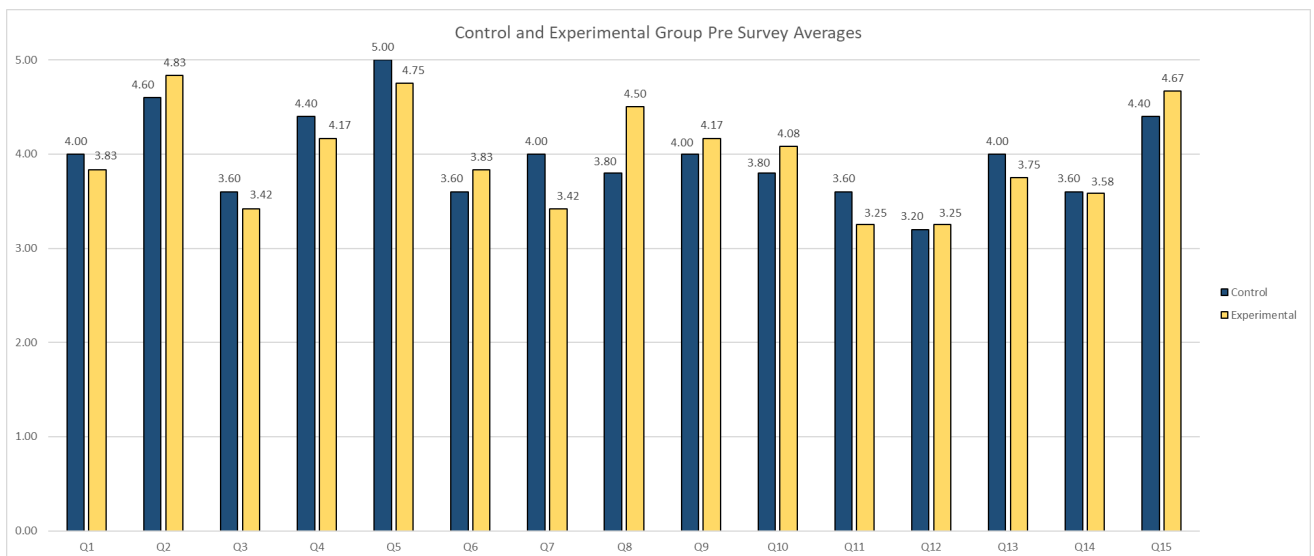


Figure 3: Control and Experimental Group Pre-Survey Averages [22]

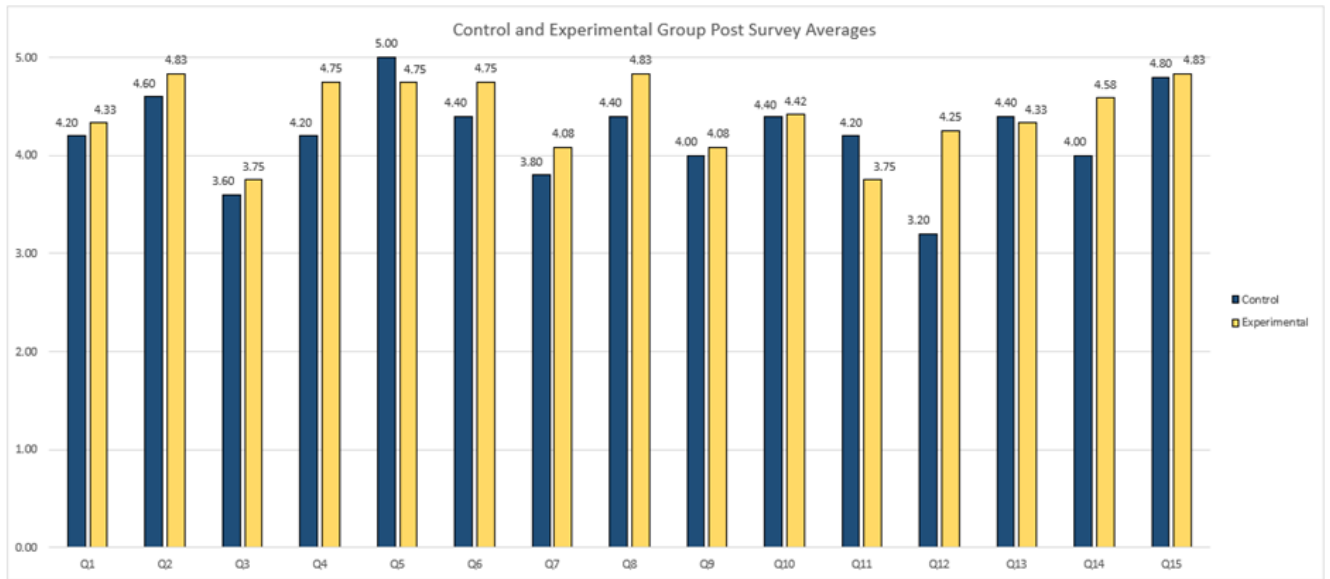


Figure 4: Control and Experimental Group Post-Survey Averages [22]

Observations

Observations conducted by both groups varied (Figures 5 and 6). The control group averaged 11.2 observations per cadet and the experimental group averaged 18.58 observations per cadet. Specific individuals from both groups did not record as much as other group members but the higher number of average observations was in the experimental group. The cadets were asked the most noticed “virtuous act.” Overall, the comments were similar and “selfless acts” were the most common (Figures 5 and 6). The experimental group reminders are listed in Figure 6. Cadets indicated the effectiveness of the reminder in helping them remember to observe.

Observations	Day 1	Day 2	Day 3	Day 4	Day 5	Total	AVE	What was the virtuous act you noticed the most?	Reminder	
1	Virtuous Acts	7	3	5	3	5	23	4.60	I noticed acts of charity the most	No
2	Virtuous Acts	2	1	3	3	1	10	2.00	Volunteering one's own time to help others when they didn't need to, or have the obligation to.	No
3	Virtuous Acts	2	2	1	1	1	7	1.40	The most virtuous thing I noticed was a player on the team correcting someone else about what someone else was saying. I think this was the most virtuous thing because it is also the hardest when you are really close with all the guys on the team	No
4	Virtuous Acts	1	0	2	1	1	5	1.00	An individual told the bartender at the Firstie that they only marked 2 drinks even though they ordered 4.	No
5	Virtuous Acts	4	2	3	1	1	11	2.20	Mainly just people being positive and wishing people to have a good day and picking up stuff even if it wasn't their's in Mess Hall/Grant Hall	No

Figure 5: Control Group Observations [22]

Observations	Day 1	Day 2	Day 3	Day 4	Day 5	Total	AVE	What was the virtuous act you noticed the most?	Reminder	
1	Virtuous Acts	0	2	0	1	0	3	0.60	Often times it was just the small actions of holding the door open for someone.	Place large capital "V" on back of phone
2	Virtuous Acts	12	10	7	7	6	42	8.40	All of Monday, people went out of their way to reach out and wish me a happy birthday. This meant a lot and showed that they cared about me enough to take the time and reach out.	Alarm reminder twice a day
3	Virtuous Acts	2	4	1	2	0	9	1.80	Diligence	Change lock screen background - Timer /
4	Virtuous Acts	8	5	6	3	5	27	5.40	Holding the door open and help carrying something	Place card in bottom of hat - "Look for virtue"
5	Virtuous Acts	6	4	4	7	5	26	5.20	Trinity volunteering to be the guidon despite her hectic week because she didn't want her other friends having to deal with their crazy weeks and drill.	Timed reminder - Alarm
6	Virtuous Acts	3	4	2	4	3	16	3.20	Holding doors open for others	Timed reminder on phone
7	Virtuous Acts	4	4	7	5	4	24	4.80	Selflessness in one way or another for the benefit of another person.	Paper planner - place in planner everyday
8	Virtuous Acts	3	1	0	2	3	9	1.80	Waiting for someone while holding the door	Two phone alarms - morning and evening
9	Virtuous Acts	6	8	1	2	4	21	4.20	The cadet who consoled the crying cadet looked to be in a hurry but still stopped to console and talk to their peer.	Save to screen saver
10	Virtuous Acts	2	3	3	2	2	12	2.40	My roommate is the BN PDO, so she is in charge of cleaning and organizing the Beaverfit in Grant Square. She recently tore her thumb tendon and got surgery to fix the injury. She was up at Keller for a couple of days and was unable to perform her duties. On one of these days I was going to workout at the Beaverfit when I saw one of the other members of BN organizing and cleaning the Beaverfit. He was helping out on his own accord.	Timed reminder - to do it and to reflect
11	Virtuous Acts	1	4	3	3	4	15	3.00	A plebe who stands at the entrance to Thayer and fist bumps everyone and tells them to have a good day. He does this every single day.	Change background on phone
12	Virtuous Acts	4	3	5	2	5	19	3.80	When my chinese instructor, spoke about China. I think it reflected well on her virtues of justice and prudence. She dissuaded her mindset and her feeling that she needs to step up for what she thinks is right. NON: When my Table Com sent the plebes to get food for the table then started eating before they got back.	Change girlfriend's photo to "V" - reminds me when texting to girlfriend which is

Figure 6: Experimental Group Observations [22]

AAR Questions

The AAR questions generated solid feedback to improve the study as well as generally positive support of the effort. Most cadet participants indicated that they appreciated the study and what it did for them. Many participants indicated that they believed they improved their understanding of virtue. The experimental group reflected more on virtue than the control group. This supports the intent of the virtue class and assigned readings as having a positive impact on cadet perception and understanding of virtue.

Discussion

This pilot study design is an attempt to see if virtue education combined with other techniques will enhance cadet understanding and perception of virtue in everyday encounters. It is hoped that this perception will have an overall positive effect on cadet character development. The findings indicate that the different treatment of the two groups influenced their post survey responses [22]. Due to the small populations, the difference cannot be stated as statistically significant; however, it does indicate that something influenced a different response between the two groups. In comparing post-survey response averages there is a much less positive response by the control group on most of the survey (Figures 3 and 4); however, there are three response averages (#5, #11, #13) which are lower in the experimental group.

Statement 5: “It is important to improve my character”. In figure 4, the graph shows the control group at 5.00 while the experimental group is at 4.75 for statement 5. This seems counter intuitive when considering the experimental group spent more time reflecting on virtue and went through a basic virtue class prior to beginning the observation exercise. The experimental group survey results show three cadets agree with this statement but are not as strong in their agreement and only provided it a score of “4”. The post survey shows a slight change in cadets strongly agreeing but it did not change the overall average. [22]

Statement 11: “I am comfortable in my ability to perceive virtue in others.” The control group averaged 4.20 while the experimental group averaged 3.75. This seems out of synch to have the control group score higher than the experimental group. The experimental group received a virtue class as well as five readings on virtue. With all this additional focus, it would lean toward the experimental group having greater confidence to perceive virtue in others. There is the possibility that this score might indicate something deeper. It might mean that the class and readings provided cadets with a greater understanding of virtue and they were very aware that the virtuous act may be more difficult to observe because they do not know why the person chooses to do a virtuous act. Their awareness of virtue might make them more thoughtful in their responses. It could also mean that the experimental group scored lower on average for the statement in the pre-survey and maintained that lower comparative score. [22]

Statement 13: “My ability to perceive good character is enhanced through character education.” The experimental group averaged 4.33 while the control group received a 4.40 average. As it may, there was a similar gap between the two groups in the pre-survey average graph (Figure 3) but gap has narrowed (.50 vs .07). [22]

There were differences between the groups in the number of observations and the higher overall scores on the post survey (Figures 4, 5 and 6). The experimental group was better prepared to observe virtue. The introductory virtue class and the readings provided the

experimental group an opportunity to better understand virtue. It only follows that the experimental group was better prepared to perceive and record virtuous acts. The experimental group had an overall higher response average (4.42 vs 4.21) in the post survey. There is a possible causal relationship between the virtue class and readings and the survey responses. The AAR responses indicate cadets viewed the study as impactful in their character development; however, "...one swallow does not a summer make..." [23]. [22]

The experimental group reminder technique had an impact on the cadet observations. The experimental group feedback during the AAR was positive toward the reminder technique. There was an impact on the overall number of average observations per cadet of the experimental group compared to the control group (6.19/cadet vs 2.24/cadet – almost three times the average number of observations). The cadet feedback recommended the technique be improved upon; however, the effectiveness of the tool was apparent in helping the experimental group to remember to observe virtue. [22]

Did this pilot study have a positive effect on cadet character development? The results of the pilot study cannot provide definitive support for a causal relationship on cadet character development; however, there is evidence of a possible causal relationship between the experimental group experience and a positive impact on observing virtue. All cadets indicated that the study was of benefit to them as indicated by their answers to AAR questions 1 and 2. [22]

Strengths of the Design

- The study design is limited in scope and straight forward. As a pilot study, the intent is to determine if there is an effect caused by independent variables (virtue education class, references, logbooks, and reminder technique) on the dependent variable (virtue awareness and observations).
- The control group provides a baseline which allows conclusions to be made.
- The pre-/post- surveys were identical, which provides some reliability in the results.
- Control and experimental groups were controlled throughout the study.
- Control and experimental groups were comparable testing groups.
- Both independent and dependent variables were controlled. [22]

Limitations of the Design

- Statistics. Descriptive statistics are presented for feasibility testing purposes. Firm conclusions cannot be drawn without carrying out inferential statistics.
- Time. Time was a constraint, which limited the researcher's ability to vet the study so that it could have provided a better result. The study concept was approved through an IRB vetting process; however, as good as that is, the details and considerations necessary to make this study "more rigorous" are a limitation.
- Test Population. The number of participants was very small which hindered the researcher's ability to conduct a thorough statistical analysis of the data. With small group numbers of five and twelve, the statistical analysis is problematic; however, generalized conclusions can be drawn.
- Test Population Group Numbers. The group sizes were distinctly different which could skew the data. For examples, the control group had five cadets. One change in the answers has a greater impact than a change in the experimental group. The

numbers were set based on the original pilot study construct and the researcher decided to keep the numbers as they fell out with full knowledge of this limitation.

- Perceiving. Recognizing a virtuous act is problematic in that the intent of the act is not necessarily known by the observer. Additionally, personal bias might interfere with the observation and limits the reliability of the data collected.
- Group Bias. This pilot was conducted with a mixed group (age, graduating class, gender, race). The study does not account for inherent differences within the group, which could skew the data. [22]

All these limitations could be addressed with a more robust experimental design but due to the time constraint it was not possible.

Summary and Recommendations

This pilot study analyzed West Point cadets, who have had character education classes, beyond the traditional classroom environment and placed them in an active learning environment where they observed and logged perceived virtuous acts in their daily lives. A comparative analysis using a survey tool was conducted to determine if a virtue class and observation exercise would enhance the cadet's ability to perceive virtue and positively impact their own character development. The study was not able to statistically support this; however, there are data that indicate a relationship between the instruction and reminder technique to the experimental group's higher positive response on the post-survey as well as the higher number of observations. The study had an impact on the cadets of both groups as indicated by their AAR question responses. Additionally, the experimental group had greater reflection on virtue. Both groups believe the study is of value and should be expanded. [22]

This study was a small-scale pilot study which limits any conclusions drawn from the findings. However, after analyzing the data, recommendations can be made for further research. The findings indicate that further research is warranted. [22]

1. A baseline of virtue education should be considered for cadets. Character education cannot be effective at this level without it.
2. The role of active learning exercises such as virtue observations do have a positive impact on cadet learning and potentially on character development.
3. The use of virtue reminder techniques are of value and should be researched to see their applicability in a broader context.

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