Challenge Course Effectiveness:
The Impact on Leadership Efficacy and Work Efficacy among College Students

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Challenge courses have become increasingly popular in recent years. Many groups are turning to half-day challenge courses due to time and financial constraints. Yet, few studies have quantified the benefits of a half-day course. The purpose of this study was to examine the effects of participation in a four-hour challenge course on leadership efficacy and work efficacy of college students. Pretest, posttest, and follow-up questionnaires were utilized. T-test analyses found that participating in a challenge course has a significant positive effect on increasing one's leadership and work efficacy from pretest to posttest, after participation in a four-hour challenge course. This research also demonstrates that increased levels of the participants' self-efficacy remained six weeks after the completion of the challenge course.

Challenge courses and adventure based programs have become increasingly popular (Hatch & McCarthy, 2005) for groups that want a different and unique way of achieving specific goals. Some of the goals of these programs include building confidence, becoming more assertive, developing problem solving skills, increasing motivation, and improving leadership skills (Long, Lindenmeier, & Robertson, 2003). Documented benefits of challenge courses include increased self-esteem, group cohesion, leadership skills, self-efficacy, work efficacy, and leadership efficacy, (Hart & Silka, 1994; Hatch & McCarthy, 2005; Paxton & McAvoy, 2000; Propst & Koesler, 1998). Individual benefits include enhancing personal growth, particularly in the areas of increasing one's sense of self-competence and risk-taking, while improving moods and a sense of hope (Hart & Silka, 1994; Paxton, 1998; Robitschek, 1996; Snow, 1992).

Many organized groups have participated in adventure courses to reap these benefits. Additional group benefits involve gains in team building, trust, and cohesiveness (Glass & Benshoff, 2002; Priest, 1998). One of the groups that has been examined includes college students.

This study will address leadership efficacy and work efficacy gained by college students participating in a four-hour (half-day) challenge course.

Challenge courses are increasingly becoming more acceptable as tools for building teams, self-esteem, and leadership skills. Although participation in these activities is growing, research in this area remains limited. Of the studies found with respect to challenge courses, most researchers have explored longer, multi-day programs (see Glass, 1999; Hart & Silka, 1994; Noland, 2002; Paxton, 1998; Propst & Koelser, 1998; Wu, 2004) rather than shorter, half-day programs. Multi-day challenge course programs, however, are becoming less popular due to cost and time constraints. Many organizations currently want the benefits of multi-day challenge courses in a shorter timeframe. Thus, participation in a short, one-day or half-day program is increasing and has been used in a wide variety of settings including corporations and school campuses (Hatch & McCarthy, 2005). However, very little evidence exists to determine how effective these half-day courses are at addressing individual and group needs. In addition, research needs to address how the benefits of these programs have an impact on an individual's view of themselves through their leadership efficacy and work efficacy. There is a lack of research about leadership and work efficacy in a four-hour challenge course, and these variables are important for assisting students in the college environment and in preparing them for future work environments.

This study has significant benefits for those who are interested in participating in a four-hour challenge course. The results of this study can be used to determine if a challenge course is beneficial to one's leadership and work skills, or if the event is primarily considered to be a recreational experience. The transference of leadership and work efficacy gained from the challenge course will also be addressed. Results of the research will benefit organizations that currently have challenge courses and those involved in marketing challenge courses. These organizations can use results of this study to show prospective participants that there are researched benefits in participating in a four-hour challenge course. Groups and organizations that utilize benefits-based programming can present the benefits gained from participation in a challenge course. The study will also assist those interested in constructing a challenge course by validating the benefits.

Bandura's Self-Efficacy Theory

Bandura first published his self-efficacy theory in 1977. This theory stated that the level of self-efficacy is based on information derived from internal or external sources. According to Bandura (1997), self-efficacy has been thought of as confidence with positive assertion. Confidence refers to strength of belief, but it does not specify the belief or whether it is a high or low belief. Self-efficacy includes both an affirmation of a capability level and the strength of that belief. "Self-efficacy beliefs determine how people feel, think, motivate themselves, and behave" (Bandura, 1994, p. 71).

Perceived self-efficacy considers individuals' beliefs about their capabilities to control their actions and events that affect their lives. This personal belief is used to affect their life choices, goals they set for themselves, resilience to adversity, and beliefs on their personal strengths and vulnerabilities. Individuals must have a strong sense of perceived self-efficacy to be able

to generate effort and desire needed to succeed (Bandura, 1994). Three dimensions were noted as having an impact on self-efficacy expectations: (a) magnitude, (b) generality, and (c) strength. The *magnitude* of the task is the perception one has on the level of difficulty of that task. *Generality* is the degree to which one extends self-efficacy to different situations. This includes taking the experience learned from one situation and being able to transfer that to another situation. The third dimension is *strength*, which is how long one will hold on to high expectations for success, despite contradictory information. The success of the adventure activity and its evaluation relates directly to these three dimensions (Bandura, 1977; Paxton, 1998). Although all three dimensions are important, the most relevant dimension for the purposes of this study is the generality dimension. The generality dimension is where transference of skills takes place.

Leadership efficacy is defined as an individual's belief in his or her abilities to take on the role of a leader within a group or setting and to be successful in that role. Self-efficacy has been found to assist in understanding the leadership development process because competency, efficacy, and judgment are considered important prerequisites for leadership (Cain & McAvoy, 1990; Green, 1990). Propst and Koelser (1998) found that perceived self-efficacy (both immediate and long-term), as related to outdoor leadership, increased immediately following a multi-day outdoor adventure program and that the efficacy level was maintained one year following the program. Paxton (1998) also reported an increase in leadership self-efficacy after a 21 day adventure program.

Eden (1992) argued that leadership was the mechanism through which managers raised performance expectations and enhanced self-efficacy that, in turn, increased performance. This led to the development of work efficacy. Self-efficacy is the belief in one's capabilities to organize and execute sources of action required to manage situations (Bandura, 1994). When this concept is applied to work, it connotes the belief in one's work-related capabilities. If an individual possesses a higher level of perceived self-efficacy, there will be more career paths that he or she seriously considers, a genuine interest in those options, a desire to better prepare themselves educationally for whatever path they choose, and greater success (Bandura, 1994). When faced with a difficult challenge related to work, individuals with a greater sense of self-efficacy exerted greater effort to master that challenge (Bandura, 1986; Schunk, 1984).

Challenge Courses & Transference

Many people envision a challenge course as a type of obstacle course (Gillis & Gass, 1993) designed to foster team building, community development, and personal growth through a progression of activities on the course. These courses can consist of group challenges, role-playing, and imagery techniques, and usually have low ropes and/or high ropes elements. These adventure activities are specifically designed to meet targeted goals that may be educational or therapeutic in nature (Gillis & Gass). "Initiatives" can also be included in challenge courses, which are group problem-solving activities aimed at promoting team development (Priest, 1996). Challenge courses can be completed in a shorter (four-hour) program or a multi-day program.

The beginning of these types of challenge courses can be traced back to adventure based programming, which began in Great Britain with the creation of Outward Bound in 1941 (Attarian & Gault, 1992). Since its inception, Outward Bound has emerged as a leading organization in the field of adventure-based education (Ewert, 1989). In experiential education, adventure education, and challenge course programming, the total person is involved in the learning process.

Most challenge course programs have common features or similarities. One of the most important elements is emphasizing the transference in the activity to daily lives. In this study, transference is defined as taking what one learned about himself or herself in a challenge course and applying it to other aspects of one's life. The three types of transference are specific, nonspecific, and metaphoric transfer (Priest & Gass, 1997). *Specific transfer* is where the individual learns a particular skill and uses that same skill in another closely related situation. *Nonspecific transfer* includes learning general principles and applying them to a different situation. *Metaphoric transfer* is when the activity can be used as a metaphor for something else. Transferring the experience itself and the benefits gained from the experience into how it affects a participant's daily life has been a strong emphasis in challenge courses.

The literature on challenge courses indicates that there are measurable improvements of self-efficacy in nominal length multi-day (two-day to three-week) courses (Hart & Silka, 1994; Paxton, 1998; Propst & Koesler, 1998; Wu, 2004). However, the literature is lacking data on the benefits of shorter courses.

Methods

This research utilized a quasi-experimental research design presented as a pretest/posttest without a comparison group. A follow-up test was given six weeks after the course. The convenience sample group consisted of college students from Old Dominion University (ODU). Students registered for the challenge course through the Recreational Sports Department's Outdoor Adventure Program. Data collection was taken on three separate dates in the fall semester of 2006. A pretest, posttest, and follow-up test were utilized. Participation was voluntary and all responses were anonymous.

The survey instrument used to conduct this research was based on Paxton's (1998) dissertation entitled, "Self-efficacy and outdoor adventure programs: A quantitative and qualitative analysis." This instrument has been reviewed for content validity by a panel of experts at the University of Minnesota and ODU. Reliability for this survey instrument was .90. The instrument used a percentage scale to assess perceived efficacy with regard to leadership and work. The scale was anchored at 0% (not at all certain), 50% (somewhat certain), and 100% (very certain).

Self-efficacy levels were measured by first separating survey questions into two constructs: one construct of questions measured leadership efficacy (e.g., work as a group member to solve a problem) and the other measured work efficacy (e.g., lead a small group in a professional or educational setting). Means were taken from each of the pretest questions that were in a construct and compared to posttest questions measuring the same efficacy levels.

The pretest survey was distributed and completed at the beginning of the day prior to participation in the challenge course. Immediately following the event, participating students were given a posttest survey. Six weeks after participation, subjects were given the follow-up survey to complete. Survey responses remained confidential.

All activities were theory-driven and kept consistent for the three data collection dates. Activities were presented in a similar manner each time and debriefed using the same questions and techniques. To ensure consistency, one facilitator was used for all three dates. In addition, an impartial observer was present to ensure that the facilitator used similar debriefing techniques and to

ensure consistency. Prior to the first data collection date, the facilitator was instructed on the importance of consistency and given an outline of activities to complete, two of which are described below.

During the Mohawk Walk, the facilitator sets the scene by explaining that many burial grounds are considered sacred to Native Americans. At certain times, Native Americans had to cross over burial grounds but did not want to disturb them. To do so, they crossed above them without touching the ground. The area for this challenge has a few scattered tree stumps, a few planks of wood (2x4s), and two trees that are connected by a low tight rope with a rope above attached to one tree. The entire group is challenged to cross the burial ground without touching the ground.

One of the last activities in the challenge course was the Spider Web. The Spider Web area has a rope that resembles an enlarged spider's web attached between two trees. At this particular course, the web is unique in that it is a four-sided spider's web, where four trees are used and a different web is set up between each tree so that it forms a square. The facilitator leads the activity by explaining that the webs belong to large spiders that are high above in the trees. If someone in the group touches the web, the spiders will be alarmed and will come down to claim their prey. The group must get to the other side of the spider's web to reach safety. The limitations are that each hole in the web can only have one person pass through it and the team needs to work together to get each participant safely through the web. At this time, spotting and safety techniques are highlighted.

Each of these activities was fun but intentional structure/debriefing was used to build one's leadership efficacy and work efficacy. Debriefing questions (e.g., What worked? What were the challenges faced? Can anyone relate this activity to daily life or college life?) were used consistently throughout each activity. Activities were geared towards building one's work efficacy by allowing the team to work together to solve a problem and complete a common task. Each participant must work to get the job done or the activity cannot be completed. For example, during the Mohawk Walk work efficacy was built by developing the group's non-verbal communication skills. In the Spider Web, group members utilized their work skills by planning ahead to figure out what would be the best method to address the problem and worked together towards a solution.

Besides work efficacy, leadership efficacy was addressed because a leader was needed to step forward and direct the group. In addition, at certain times when an idea was not working another leader may step in and take control by suggesting another idea. As in the Spider Web, having some participants naturally lead by example and give ideas could possibly build one's leadership efficacy, even without communication. Leaders can gain efficacy by accepting challenges and leading the team to success.

After data were collected, *t*-tests were used to analyze the data. Leadership efficacy and work efficacy were separated in the analysis. Descriptive statistics were analyzed and point-biserial correlation coefficients were calculated. Data were analyzed using the Statistical Package for the Social Sciences (SPSS 14.0).

Results

A total of 43 surveys were collected from three separate data collection dates. Of the 43 respondents surveyed, 72% were female. Respondents ranged in age from 18 to 36, with the average age being 21. There were 65.1% of the participants that have had no prior experience in any type of challenge course. Of those that have completed a challenge course previously, 23.3% participated in a half-day course (four hours), 9.3% participated in a whole day course (eight hours), and 2.3% participated in a multi-day challenge course. There were 44.2% of the participants that were not currently in a leadership role, while 55.8% were involved as a leader in a student, religious, or outside group. In regards to work, 7.1% of the participants work full time, 61.9% work part time, and 31% were not employed at the time of data collection. The breakdown for level in college was 16.3% sophomores, 41.9% juniors, 34.9% seniors, and 7% graduate students. Table 1 explores the difference in means for both leadership and work efficacy from pretest to posttest.

Data were analyzed using independent and paired samples *t*-test. All statistical analyses were evaluated at $p < .05$ using two-tailed tests. The data were entered, checked for inaccurate entries, and screened for univariate outliers with none found. All participants completed pretest and posttest surveys, while 20 participants completed the follow-up survey.

Hypothesis One

Participants demonstrated significantly higher leadership efficacy scores at the posttest ($M = .81$, $SD = .16$) than they did during their pretest ($M = .73$, $SD = .13$), t (42) = -3.37, $p = .001$. To determine the proportion of variance accounted for, the point-biserial correlation coefficient (r^2_{pb}) was found to be .22. This states that one is 22% closer to predicting the participants' scores when one predicts the mean of each efficacy score separately, compared to when one ignores this relationship.

In challenge courses, activities are geared to stimulate group cohesion and growth. Having a variety of challenging activities causes different individuals with different skills and abilities to take responsibility of being a leader. The aspect of volunteering themselves in that leadership position assists in increasing their leadership efficacy levels.

Hypothesis Two

Participants demonstrated significantly higher work efficacy scores at the posttest ($M = .86$, $SD = .11$) than they did during their pretest ($M = .82$, $SD = .14$), t (42) = -4.08, $p = .001$. To determine the proportion of variance accounted for, the point-biserial correlation coefficient (r^2_{pb}) was found to be .29.

TABLE 1. Mean Scores for Challenge Course Participants

	Pretest Scores	Posttest Scores
Group Data (n = 43)		
Leadership Efficacy	.73 (.13)	.81 (.16)
Work Efficacy	.82 (.14)	.86 (.11)
Prior Participation in a Challenge Course (n = 15)		
Leadership Efficacy	.75 (.09)	.79 (.12)
Work Efficacy	.80 (.12)	.84 (.12)
No Prior Participation in a Challenge Course (n = 28)		
Leadership Efficacy	.73 (.15)	.79 (.13)
Work Efficacy	.82 (.15)	.87 (.11)

Standard deviations in parenthesis.

While leadership efficacy had a larger increase from pretest to posttest, the proportion of variance accounted for shows that work efficacy had a larger effect on the participants than leadership efficacy. Upon closer examination, this could be attributed to the leadership efficacy standard deviation being larger (0.16) than the work efficacy standard deviation (0.11). This data suggests that although leadership efficacy increased more due to participation in the four-hour challenge course, work efficacy had a larger impact on participants. In challenge courses, teams must work together to complete tasks and overcome obstacles. By working together to complete a common objective, work efficacy levels can be raised.

Hypothesis Three

Participants demonstrated similar leadership efficacy scores at the follow-up test (M = .78, SD = .14) as during their posttest (M = .77, SD = .12), t (19) = -.43, p = .67. Overall leadership efficacy scores had no significant difference from posttest to follow-up test, indicating that leadership efficacy levels were maintained over six weeks.

There was a slight increase from posttest to follow-up test, but the results were not significant. The researchers believe there were other factors involved that helped increase general efficacy levels. Being that the participants were college students, levels might have increased due to other involvements such as classes, conferences, extracurricular activities, work, or other trainings they received. In addition, many of the students were from the same academic major. This issue is addressed in the limitations section.

Hypothesis Four

Work efficacy scores remained similar from the posttest (M = .84, SD = .12) to the follow-up test (M = .86, SD = .11), t (19) = -1.24, p = .23. Overall work efficacy scores had no significant difference from posttest to follow-up test, indicating that work efficacy levels were maintained over six weeks.

Limitations

The first limitation was a lack of a comparison group in this study. The inclusion of a comparison in the analysis improves confidence that the gain in the dependent variable was due to the independent variable. The short time span between pretest and posttest can also be seen as a limitation, as was the sample size. The research conducted would be stronger if there were more data gathered, and it is recommended that future research have a larger sample size. This would also assist in analyzing the sub-groups with more conclusive outcomes and give more power to data collected. Another way to give more power to data collected would be the use of random sampling. This study is limited by the use of convenience sampling and future studies should use alternative sampling methods.

In an effort to obtain a larger sample size, two recreation and tourism classes offered extra credit for participation in the four-hour challenge course event. While this action worked to generate more interest, it did cause a limitation in the group sample since many of the participants were recreation and tourism majors. Those students might or might not be taking leadership or other classes that may have an effect on efficacy either from pretest to posttest or from posttest to follow-up test. It is also important to emphasize that the specific number of recreation and tourism majors were not recorded in relation to other students that were not of this major. The impact of these students is another possible limitation in the study.

Discussion

Data support the notion that participation in a four-hour challenge course significantly increases the participants' levels of leadership and work efficacy. This shorter, four-hour course appeared to have a significant positive effect on self-efficacy. In addition, this increased efficacy score remained over a six-week period. This finding has many implications for participation in challenge courses, adventure programs, and the field of outdoor recreation as a whole. Current practitioners and managers of challenge courses can use this information to validate benefits of the programs for participants. In addition, specific information on leadership efficacy and work efficacy benefits can be used to target possible participants that are trying to increase these qualities.

This study also assists in broadening the knowledge base of outdoor recreation and education. The results of this research demonstrate that programs are making a direct impact on the participants' efficacy. Many outdoor recreation programs are now being encouraged to offer "benefits-based programming," where the program coordinator needs to make a connection between participation in an activity and the benefits gained from that participation. This study will assist a coordinator in this type of programming method while exploring the benefits of four-hour challenge courses. As the popularity of outdoor education and adventure programs are increasing, research must also be increased in this area to support the need for these types of programs.

Based on the findings, the following recommendations for future research are suggested. First, more studies on four-hour challenge courses need to be made to determine other benefits of participation besides self-efficacy. Second, this research study was conducted on the effects of a four-hour challenge course on college students and needs to be expanded to other groups. Third, future research should use triangulation to better support efficacy gains. This study used self-report techniques and was based on the participants' perception of efficacy. Self-perception is a limitation to this research and all research that collects data using self-reported methods. Triangulation could use measurements from participants as well as other individuals who might notice a change in leadership or work efficacy levels.

As challenge courses become more utilized in programs, the benefits of participation need to be researched. More and more, businesses, religious groups, youth groups, clubs, and organizations are turning to challenge courses to gain benefits from participation. There is currently a large amount of research in challenge courses that are longer than one day (Gass, 1987; Paxton & McAvoy, 2000), but few studies deal specifically with the four-hour course (see Hatch & McCarthy, 2005). These shorter courses are slowly becoming more popular due to time and budget limitations, yet their benefits have not been researched. This research has addressed questions concerning shorter challenge courses and their effect on one's self-efficacy. It showed that participation in a four-hour challenge course can lead to increased leadership and work efficacy levels, and that results were significant. A consistency in leadership and work efficacy levels from posttest to follow-up test, after six weeks, was also noted by the researchers.

Bandura's theory of self-efficacy was a driving force for this research. In the theory, the three dimensions that have an impact on self-efficacy include magnitude, generality, and strength. This research highlighted generality, where the action learned from participation in a challenge course was transferred into the participants' daily lives in the form of leadership and work efficacy. Increased levels of leadership and work efficacy can assist college students in their study habits, develop work skills for the future, and benefit them both in college and in a career.

As outlined above, several new questions arose from this study. These questions can serve as a guide for researchers to continue examining the link between challenge courses and the benefits of participation. Not only will this research benefit those who design, construct, and conduct challenge courses, but it will assist in filling the gap in current knowledge about outdoor adventure programs.

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